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**Policy directions in public agricultural research: CGIAR's public goods
mandate and plant genetic resources**

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SPRU – Science Policy Research Unit
University of Sussex
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Declaration of originality:

I hereby declare that this thesis has not been, and will not be, submitted in whole or in part to another University for the award of any other degree.

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Policy directions in public agricultural research: CGIAR's public goods mandate and plant genetic resources

SUMMARY

The conservation and use of plant genetic resources (PGR) is subject to a range of international treaties and conventions, but these have not resolved controversies over rights of access to seeds, control over new crop varieties or biodiversity conservation. This thesis examines the role of CGIAR, a publicly-funded body that manages 11 international genebanks, within these debates.

The thesis explores how the role of, and strategy for, public international agricultural research (IAR) has evolved in the light of changes in governance of the global agri-food system (1990 – 2012). The research takes CGIAR as its central case study, using archival research and key informant interviews to examine the relationship between CGIAR's mandate to provide 'global public goods' (GPGs) and its policy decisions on the management of plant genetic resources (PGR) and intellectual property.

It examines how different understandings of GPGs fitted with or challenged dominant discourses about future agri-food systems, and whose interests have been served by CGIAR's changing understandings of its role.

The research finds that there were multiple and vague understandings of the GPG concept across CGIAR and its donors; and that this ambiguity was critical in CGIAR's policy choices on PGR management. The evidence shows that CGIAR's ostensible policy goals on the management and use of PGR remained remarkably stable over time. It explains this stability by demonstrating how ambiguity over the GPG concept enabled particular narratives about how science contributes to development outcomes to remain dominant.

It finds that an over-focus on the *global* aspect of its GPG mandate undermined opportunities within CGIAR to consider the different *publics* that IAR should serve, and the range of *goods* they might need. This framing of CGIAR's public goods mandate resulted in a policy alignment with dominant, market-based, paradigms of agricultural development, to the neglect of opportunities for the exploration of alternative pathways to development.

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List of acronyms

ABS	Access and Benefit-Sharing
AGRA	Alliance for a Green Revolution in Africa
AKST	Agricultural Knowledge, Science and Technology
AR4D	Agricultural Research for Development
BMGF	Bill and Melinda Gates Foundation
CAS-IP	Central Advisory Service on Intellectual Property: a unit set up within CGIAR to provide advice to Centres on the management of intellectual property (IP)
CBC	Committee of Board Chairs: Committee consisting of the Chairs of the Boards of the CGIAR Centres (CGIAR Committee)
CBD	Convention on Biodiversity
CDC	Centre Directors' Committee (CGIAR Committee)
CDM (T)	Change Design and Management (Team) (CGIAR internal body)
CFS	Committee on World Food Security
CG	Consultative Group: refers to the Members of CGIAR
CGIAR	Consultative Group on International Agricultural Research
CGRFA	Commission on Genetic Resources for Food and Agriculture (FAO body which oversees the Seed Treaty)
CIAT	International Centre for Tropical Agriculture (CGIAR Centre)
CIFOR	Centre for International Forestry Research (CGIAR Centre)
CIMMYT	International Maize and Wheat Improvement Centre (CGIAR Centre)
CIP	International Potato Centre (CGIAR Centre)
CSO	Civil Society Organisation
CWR	Crop Wild Relatives
DFID	Department for International Development (UK government aid department)
ExCo	Executive Council (CGIAR internal body)
FAO	Food and Agriculture Organisation of the United Nations
FR	Farmers' Rights
GATT	General Agreement on Tariffs and Trade
GCDT	Global Crop Diversity Trust also known as the Crop Trust
GFAR	Global Forum on Agricultural Research
GM	Genetic Modification
GMO	Genetically Modified Organism
GPG	Global Public Goods
GPG / IPG	Global Public Goods / International Public Goods
GR	Green Revolution
GRFA	Genetic Resources for Food and Agriculture
GRPC	Genetic Resources Policy Committee (CGIAR Committee)
IA	Intellectual Assets
IAASTD	International Assessment of Agricultural Knowledge, Science and Technology for Development
IAR	International Agricultural Research
IARC	International Agricultural Research Centre
IBPGR	International Board for Plant Genetic Resources. Name changed to IPGRI in 1991 and to Bioversity International in 2006 (CGIAR Centre)
IBRD	International Bank for Reconstruction and Development

ICARDA	International Centre for Agricultural Research in the Dry Areas (CGIAR Centre)
ICLARM	International Centre for Living Aquatic Resources Management. Now WorldFish (CGIAR Centre)
ICRAF	International Centre for Research in Agroforestry. Now World Agroforestry (CGIAR Centre)
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics (CGIAR Centre)
ICW	International Centres Week (an annual meeting of CGIAR Centres)
ICWG-PGR	Inter-Centre Working Group – Plant Genetic Resources (CGIAR internal body)
IFPRI	International Food Policy Research Institute (CGIAR Centre)
IGC	Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore of WIPO
IIMI	International Irrigation Management Institute. Now IWMI (CGIAR Centre)
IITA	International Institute of Tropical Agriculture (CGIAR Centre)
ILCA	International Livestock Centre for Africa. Merged with ILRAD in 1994 to form ILRI (CGIAR Centre)
ILRAD	International Laboratory for Research on Animal Diseases. Merged with ILCA in 1994 to form ILRI (CGIAR Centre)
ILRI	International Livestock Research Institute (CGIAR Centre)
INIBAP	International Network for the Improvement of Banana and Plantain. Became part of IPGRI in 1994 (CGIAR Centre)
IP	Intellectual Property
IPR	Intellectual Property Rights
IPG	International Public Goods. Used interchangeably with Global Public Goods
IPGRI	International Plant Genetic Resources Institute. Now Bioversity International (CGIAR Centre)
IRRI	International Rice Research Institute (CGIAR Centre)
ISNAR	International Service for National Agricultural Research. Became part of IFPRI in 2004 (CGIAR Centre)
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture, also known as the Seed Treaty
IU	International Undertaking on Plant Genetic Resources: the 1994 agreement between CGIAR Centres and FAO on the management of genetic resources held in CGIAR genebanks
IWMI	International Water Management Institute (CGIAR Centre)
LIC	Low Income Country
MAT	Mutually Agreed Terms
MLS	Multi-lateral System (for the exchange of PGR under the Seed Treaty)
MTA	Material Transfer Agreement
MTM	Mid-Term Meeting: one of the biannual meetings of the CGIAR members and other stakeholders, alternating with the International Centres' Week. This system was replaced with AGMs in 2001
NARS	National Agricultural Research System
NGO	Non-Government Organisation
NGOC	Non-Government Organisations Committee (CGIAR committee)
NRM	Natural Resource Management

PBR	Plant Breeders' Rights
PGR	Plant Genetic Resources
PGRFA	Plant Genetic Resources For Food And Agriculture
PIC	Prior Informed Consent
PPP	Public-Private Partnership
PS	Private Sector
PSC	Private Sector Committee (CGIAR committee)
PVP	Plant Variety Protection
RAFI	Rural Advancement Foundation International
RF	Rockefeller Foundation
RTF	Right To Food
SC	Science Council (CGIAR committee)
SGRP	System-wide Genetic Resources Programme (CGIAR programme)
SINGER	Systemwide Information Network for Genetic Resources (CGIAR programme)
SMTA	Standard Material Transfer Agreement
SPC	Science and Partnership Committee (CGIAR committee)
SRF	Strategy and Results Framework
STEPS Centre	Social, Technological and Environmental Pathways to Sustainability Centre
TAC	Technical Advisory Committee (CGIAR committee)
TK	Traditional Knowledge
TNC	Trans-National Corporation
TRIPS	Agreement on Trade-Related Aspects of Intellectual Property Rights
TSR	Third System review: review of CGIAR conducted in 1998
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UPOV	International Union for the Protection of New Varieties of Plants
USAID	United States Agency for International Development
WARDA	West Africa Rice Development Association. Now called Africa Rice Centre (CGIAR Centre)
WIPO	World Intellectual Property Organisation
WTO	World Trade Organisation

List of CGIAR Centres

CIAT	International Centre for Tropical Agriculture
CIFOR	Centre for International Forestry Research
CIMMYT	International Maize and Wheat Improvement Centre
CIP	International Potato Centre
IBPGR	International Board for Plant Genetic Resources. Name changed to IPGRI in 1991 and to Bioversity International in 2006.
ICARDA	International Centre for Agricultural Research in the Dry Areas
ICLARM	International Centre for Living Aquatic Resources Management. Now WorldFish
ICRAF	International Centre for Research in Agroforestry. Now World Agroforestry
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
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ILCA	International Livestock Centre for Africa. Merged with ILRAD in 1994 to form ILRI
ILRAD	International Laboratory for Research on Animal Diseases. Merged with ILCA in 1994 to form ILRI
ILRI	International Livestock Research Institute
INIBAP	International Network for the Improvement of Banana and Plantain. Became part of IPGRI in 1994
IPGRI	International Plant Genetic Resources Institute. Now Bioversity International
IRRI	International Rice Research Institute
ISNAR	International Service for National Agricultural Research. Became part of IFPRI in 2004
IWMI	International Water Management Institute
WARDA	West Africa Rice Development Association. Now called Africa Rice Centre

Note on terminology

At its establishment, CGIAR was known as the Consultative Group on International Agricultural Research – the CGIAR. However, it now goes by its acronym only, and is referred to as ‘CGIAR’. The thesis uses ‘CGIAR’ (without the definite article), except when ‘the CGIAR’ is part of a direct quote.

The original ‘consultative group’ was made up of donor countries brought together to support a small number of international agricultural research centres (Centres). Over time, CGIAR developed into a complex system consisting of donors, Centres, committees, and a range of administrative system offices.

In this thesis, ‘the System’ is used to refer to the centralised bodies that serve the donors or Centres i.e. the committees, administration and service bodies. The term ‘CGIAR’ is used to refer to the decision-making body i.e. the Members.

‘Members’ or ‘donors’ refers to the donor countries, foundations and international organisations which support CGIAR. Authors quoted may refer to members as ‘the Group’.

‘Centres’ refers to the IARCs. The Centres are the international agricultural research centres which come together under the umbrella of CGIAR. These are autonomous institutions, with their own boards and governance structures.

The term ‘global public goods’ is often used by academics and theorists, while ‘international public goods’ is more often used by CGIAR stakeholders. The thesis uses the terms synonymously.

Several people were interviewed as part of the research process for this thesis. They are listed in Appendix Three. They are referred to in the thesis text by the number assigned to them in Appendix Three (i.e. I1. I2 etc.) in order to maintain anonymity of those interviewees who requested it.

1. Introduction

1.1. Context and key definitions

The global food system faces enormous challenges. Millions of people, particularly in low-income countries, do not have enough to eat. In richer countries, obesity and poor nutrition are creating long-term health problems (FAO et al., 2020). Climate change and biodiversity loss affect food production systems across the world. While these problems are widely acknowledged, the solutions are hotly contested by governments, international agencies and civil society groups. There are different visions of how agriculture should be organised to grow enough food for the global population, in environmentally sustainable ways, and to ensure that the food available is accessible to all.

Approaches to reducing hunger in low-income countries have often started from the premise that hunger is a consequence of scarcity - not enough food is available. They have therefore focused on increasing food production and agricultural productivity through technological developments such as new crop varieties to increase yields. Alternative perspectives have challenged this technocratic approach, arguing that broader social, political and economic factors affect people's ability to access food, even when it is available. These contrasting models of agricultural development imply alternative solutions to the challenges of feeding the global population.

CGIAR¹, a publicly-funded international agricultural research organisation, was established in 1971 to provide scientific expertise and research inputs aimed at increasing agricultural production and productivity, especially in low-income countries. However, after decades of investment in agricultural research, hunger and poverty levels remain stubbornly high, especially in sub-Saharan Africa and India.

CGIAR's mandate has evolved with time², but its core mission is to produce research to support agricultural development in low-income countries. However, given that models of agricultural development are contested, questions arise about what public agricultural research bodies should do. What sort of research should they conduct, with whom and for whom? How should they decide on their goals and priorities? Which stakeholders are to be

¹ CGIAR was originally known as the Consultative Group on International Agricultural Research, but now goes by its acronym only.

² CGIAR's first annual report in 1984 stated: "The purpose of the research effort is to improve the quantity and quality of food production in developing countries" (CGIAR Secretariat, 1985, p.2). CGIAR's 2013 annual report stated "CGIAR research is dedicated to reducing rural poverty, strengthening food security, improving human health and nutrition, and sustainably managing natural resources." (CGIAR Consortium Office, 2014). For how CGIAR's mission changed over time, see Appendix One.

included or excluded from policy-making processes? Who holds the power to shape policy decisions and research directions? And how has that, and does that, influence CGIAR's outputs and outcomes? This thesis explores those questions by examining CGIAR's decisions about the content and directions of its research, the factors influencing its choices, and the consequences of those choices.

A core element of CGIAR's work is the development of new crop varieties, and crop development research is underpinned by seeds and crop biodiversity. The focus of the thesis is on CGIAR's policy approaches to its use, control and management of crop biodiversity, through the plant genetic resources held in its genebanks and those produced by its researchers. The UN FAO defines plant genetic resources (PGR) as:

"The reproductive or vegetative propagating material of: 1. cultivated varieties (cultivars) in current use and newly developed varieties; 2. obsolete cultivars; 3. primitive cultivars (landraces); 4. wild and weed species, near relatives of cultivated varieties; and 5. special genetic stocks (including elite and current breeder's lines and mutants)." (Zaid et al., 2001)

FAO further defines plant genetic resources for food and agriculture as:

"any genetic material of plant origin of actual or potential value for food and agriculture". (FAO, 2009b, p.3)

i.e. of potential value as a resource for crop development. How that category has been circumscribed in practice is a contentious issue, one which is examined in Chapter Two. For the purposes of this thesis, the term 'plant genetic resources' (PGR) is understood to mean all plant germplasm³, whether it is currently considered to have potential value for crop development or not.

Agricultural research plays a key role in determining how plant genetic resources (PGR) are used: which crops are developed and made available to which farmers for them to grow. Which crops, grown where, under what conditions and by whom affect the shape of agricultural systems and key features of food systems.

This thesis examines the role of CGIAR, a publicly-funded body that manages 11 international genebanks, within debates about rights of access to seeds, control over new crop varieties and biodiversity conservation. It considers how CGIAR and its public funders have interpreted its responsibility to keep PGR in the public domain, and to produce 'public goods' through its research. It examines these issues in the context of contestation about the current and future

³ Germplasm is living genetic material from which new plants can be grown.

shape of the global food system, and the role envisaged for agricultural research and technology within different approaches.

It explores the interplay between policy developments in CGIAR and changing global governance structures over time; and the dynamics of decision-making among key actors and networks operating both within CGIAR and in the wider global agri-food system. The thesis aims to identify which interests were dominant, which discounted, and whose interests were served by the directions chosen for CGIAR's agricultural research.

This chapter introduces CGIAR as an institution, and outlines its historical role in, and contributions to, agricultural research, including biodiversity conservation and use. It presents the main topics of the thesis and their relevance. It concludes by providing an overview of how the research will be set out in the subsequent chapters.

1.2. A brief history of CGIAR

CGIAR is a partnership of 15 international agricultural research centres supported by donor institutions and governments. It was established in 1971, in response to growing concern about levels of hunger in low-income countries, and particularly US concerns that this could lead to political instability (Hall et al., 2000). It was established with support from the World Bank, the FAO, USAID and the Rockefeller and Ford Foundations, and initially funded exclusively by industrialised countries. It brought together four agricultural research centres that had been founded in the 1960s. Those centres focused on plant breeding and producing new varieties of key staple crops – rice, wheat and maize. These centres had played important roles in developing the seed varieties associated with the Green Revolution. As part of that process, they had started collecting and conserving genetic resources to provide the raw materials for their breeding programmes (Chandler, 1992). At its founding, CGIAR considered biodiversity as a resource for agricultural research.

CGIAR was founded on the assumption that increasing agricultural production and productivity would reduce hunger and poverty in low income countries, and that scientific research could provide the means by which to increase production. It focused on specific technical problems, in isolation from local political, social or environmental contexts. Its initial approach was based on a 'pipeline' model of scientific and technological research, derived from US agricultural research systems (Fitzgerald, 1986) in which scientists identified research priorities to increase production (Hall et al., 2000) and delivered the outputs of research so that they could be made available to smallholder farmers. Its role was to fill perceived gaps in the research provided by national agricultural research systems (NARS) and/or by commercial companies i.e. its

founding role was predicated on an assumption of the need for, and relevance of, internationally applicable agricultural science.

Since the 1990s, CGIAR has defined its mandate in terms of the delivery of international (or global) public goods (GPGs)⁴. These have been defined within CGIAR as outputs of research that are freely available to all countries and are universally applicable and scalable (Ryan, 2006). However, both this definition and its applicability to CGIAR's work have been, and remain, contested.

Since its establishment, CGIAR has expanded the number of its centres and undergone several structural changes and reforms. Its work now covers a range of programme areas including forestry, fisheries, livestock, water management, nutrition and natural resource management (Ozgediz, 2012).

There have been critiques of CGIAR's main approach (which separates the production of new technologies from the socio-economic context in which they will be used) from both inside and outside the system. CGIAR's failures to engage with the complexities of rural poverty were highlighted and counter-posed by the development of alternative narratives, such as the participatory approach (Thompson and Scoones, 2009) and Farmer First research agenda-setting. Whilst some scientists within CGIAR engaged with these participatory approaches, they have remained at the margins.

Similarly, CGIAR's approach to PGR conservation and crop development has been criticised for prioritising *ex situ* conservation, and laboratory-based (rather than field-based) development of new crop varieties. Critics have challenged what they have considered to be an extractive approach that is disconnected from the farming systems and communities from which crop biodiversity derives and within which new crops are supposed to be used (e.g. Brush, 1989).

Since its establishment, the context within which CGIAR works has evolved. Several pressures on CGIAR and on its role within the wider agri-food system can be identified. These include increased private sector involvement in agricultural research, and associated changes to intellectual property regimes; changing interests of donors, including a focus on sustainability and equity issues; and the coming together of proponents of alternative models of agricultural research in the Agricultural Research *for* Development (AR4D) movement (Maru et al., 2018).

Similarly, global frameworks for the use, management and exchange of PGR have evolved since CGIAR's first genebanks were established. The genebanks were initially created to provide resources for use in CGIAR's own crop breeding programmes, but they now also play a key role in global

⁴ In general, CGIAR documents discuss the provision of international, rather than global, public goods, but if GPGs are defined as public goods relevant to more than one country (Kaul et al., 1999a) then these terms can be considered as interchangeable.

biodiversity conservation strategies (FAO CGRFA, 2010). CGIAR's policies on managing the PGR it holds have both responded to, and shaped, the overlapping international treaties, conventions and regulatory regimes established to deal with biodiversity conservation, plant breeders' rights and farmers' rights. These multiple frameworks are described in Chapter Two.

However, across these regimes, many issues about PGR management remain contested and politically controversial. CGIAR is both a primary user and a curator of PGR. Furthermore, CGIAR is both affected by changing regulatory frameworks, and an actor shaping them. These dual roles are an element of the story explored in this thesis.

1.2.1. Contested approaches to agricultural development

There is some consensus that the current food system functions in line with a dominant model of global development predicated on the proposition that agricultural growth leads to economic growth and then to poverty reduction. In this model, there is a focus on increasing agricultural production and productivity, and addressing food insecurity through market structures and mechanisms.

Against this model, civil society and farmer groups have developed radically different visions of how the food system should operate, invoking non-technological concepts such as the 'right to food' and 'food sovereignty' approaches. Proponents have called for food supply and research policies to focus on goals that explicitly include concerns such as social justice, human rights and environmental sustainability. Those alternative framings are explored in more detail in Chapter Two.

The thesis explores the role of agricultural research within the context of these widely recognised competing models. It considers that these models broadly define existing positions of stakeholders in the global agri-food system. The thesis does not engage directly with the validity of these framings, instead taking them as a starting point from which to explore questions of what kinds of agricultural research fit with which broad models of agricultural development.

Perspectives on the use and control of PGR can also be understood in the context of these contrasting approaches.

Kloppenborg has argued that the development of modern agriculture in industrialised nations has historically been based on "...the continuous appropriation of plant genetic resources from source areas of genetic diversity..." in the global South (Kloppenborg, 2004, p.14). Kloppenborg claimed that CGIAR's founding Centres were created, at least in part, to "...collect

systematically the exotic germplasm required by the breeding programs of the developed nations.” (ibid, p.15).

Additionally, the Green Revolution changed agricultural production systems in the countries where it was implemented, such as India and the Philippines, for instance through increasing investment in geographical areas with high agricultural potential and subsidising the use of external inputs such as fertiliser (Pingali, 2012). In this context, the ownership, use and control of PGR, the types of seeds produced, by whom and for whose benefit are all key questions relating to the shape of agricultural development. The development of biotechnology and the expansion of intellectual property rights (IPR) into the agriculture sector has made these questions even more pressing. Stakeholders seeking to challenge technology- and market-based approaches to agricultural development, have similarly questioned the increased role – and control – of corporate actors in shaping seed systems, especially those for poor farmers in low-income countries

It is in this context of contestation over alternative approaches to addressing hunger and poverty that the thesis examines the evolution of CGIAR’s policy-making systems and decisions. It considers what choices were made at CGIAR’s central policy level about the objectives and direction of its research, and attempts to understand why those choices prevailed. It uses CGIAR’s approach to PGR management as the lens through which to examine those questions.

1.3. How this research adds to understanding of the global food system

1.3.1. The contribution of other research to this area

The use, ownership and control of PGR in crop development have been examined from several competing perspectives. For example, Tansey & Rajotte (2008) examined international frameworks governing intersecting issues of biodiversity conservation, plant breeding and IP. Muraguri (2010), Feindt (2013) and Lawson (2004) focused on the impact of the extension of IP rules into crop development. Kloppenburg (2004) and Parry (2004) examined the impact of new technologies (biotechnology and genomic research respectively) on the political economy and governance of seed production. These literatures are explored in Chapter Two.

The contributions of agricultural research to different systems of agricultural development have also been discussed. Pistorius and van Wijk (1999) applied a political economic analysis to questions of the use and control of PGR. They provided evidence showing how different models of agricultural development required different policies on PGR management; and they identified power dynamics shaping policy decisions. Their research focused on the role of

nation states in deciding agricultural development directions. Building on their approach, this thesis asks similar questions about the role of publicly-funded IAR, and the factors leading to policy decisions about the content and directions of agricultural research.

Sumberg et al. (2013) also raised questions about the impacts of politics and power in decision-making about research priorities. They called for further research into how these factors influenced decisions about the direction of agricultural research. Brooks (2010) focused on how CGIAR understood the value of internationally-applicable science, and used it in its crop development programmes. She called for further research to examine the nature of “...‘public goods’ science...” (ibid, p.77), and CGIAR’s role in its provision.

To address these questions, the thesis aims to bring together a political economic analysis of factors influencing agricultural research with an examination of CGIAR’s ‘public goods’ mandate. By doing this, it examines the dynamics of policy making in IAR and the research directions chosen as a result; and the implications of those choices for the intended end-users of agricultural research. Chapter Three sets out the conceptual framework developed to accomplish those tasks.

1.3.2. The thesis’ approach

This thesis provides an analysis and explanation of CGIAR’s policy-making processes regarding the PGR it holds in its genebanks and uses in its crop development programmes. It examines how CGIAR, and its stakeholders, have understood its mandate to produce public goods and how those understandings have changed over time. The research explores how CGIAR’s approaches to PGR management have intersected with different conceptualisations of its public goods mandate, and with policy on IP. It examines the range of positions held by different actors, asking which positions came to dominate policy decisions, how and why.

The thesis uses the evolution of CGIAR’s policy-making and decisions on PGR management, in connection with its public goods mandate, as a lens with which to examine the political and power interests that have shaped IAR in the context of conflicting views on the operation of the global agri-food system. Through this lens, it aims to understand how approaches to PGR management, and interpretations of ‘global public goods’, at different times have supported or challenged choices about directions in research and agricultural development. It asks why those choices were made, and who has benefitted from the chosen directions.

In doing this, the thesis takes an explicitly normative position. Based on CGIAR’s stated mission to reduce hunger and poverty, it understands that publicly-funded research should seek to address the needs of poor and food-insecure farmers in Low Income Countries (LICs). Using a

framework outlined in Chapter Four, it examines how different understandings of its mission to reduce poverty and its mission to produce public goods have interacted with each other and with what impact on policy directions.

1.3.3. Relevance of the thesis' approach

CGIAR's approach to agricultural research, enacted initially through the Green Revolution, reshaped agricultural systems across many countries, particularly in Asia. However, it has been subjected to surprisingly little academic scrutiny. Much of the literature about it has been written by insiders (e.g. McCalla, 2014, Ozgediz, 2012) and has focused on its organisational development rather than what it does and why. This research seeks to contribute to filling that gap.

CGIAR has also played a central role in shaping policy frameworks governing biodiversity conservation and use. At the same time, its work has been affected by those changing policy frameworks. An examination of how CGIAR has decided its own policy directions may therefore illuminate the dynamics of change in international regulatory regimes governing PGR use and management.

CGIAR is only one institution within the field of IAR, and its importance has waxed and waned as other actors have gained greater influence. However, CGIAR is a relevant case study precisely because its position within the wider field of IAR has changed over time. Its role and approach have been influenced by changes in global governance frameworks and by changing development priorities among its donors and within the wider global agri-food system. By tracing changing understandings of CGIAR's role as a provider of public goods, the study sheds light on the impact of shifting influences at play in IAR and the pressures shaping CGIAR's policy directions.

Additionally, CGIAR's donors and stakeholders are all key players in the IAR and development arenas. Stakeholders include major donors such as World Bank and USAID, private foundations such as the Gates and Syngenta Foundations, as well as civil society and farmers' groups represented through the Global Forum on Agricultural Research (GFAR). These stakeholders have exercised varying degrees of power within CGIAR at different times, influencing its policy directions. A study of CGIAR's policy processes may therefore increase understandings of power dynamics shaping approaches to agricultural development, and more broadly the functioning of the global agri-food system.

1.3.4. Research limits

The research focuses on CGIAR's central policy-making processes, specifically its evolving approaches to its public goods mandate. It does not – and could not – give a full account of all the areas of CGIAR's work, and does not engage in any detail with its programme work i.e.

what CGIAR actually does. Instead it examines the policies it has developed to guide its programmes of work. However, CGIAR is a large and complex body, and different parts have different priorities, interests and approaches. Throughout its history it is possible to find examples of work that challenge CGIAR's central narratives about its role and ways of working. While not engaging directly with the wide range of programmes it has implemented, the thesis aims to explore why such alternative approaches have remained at the margins rather than being represented in central policy making processes.

The thesis covers a time-frame which encompasses major changes in PGR governance, both within CGIAR and in international frameworks. After a brief overview of PGR debates in CGIAR from 1971 – 1990, the study examines events from 1990 ending in 2012, when CGIAR completed a major internal reform process. More specifically, as part of that reform, CGIAR developed policy on PGR management and intellectual property, which has not been revised since.

However, CGIAR has undergone (at least) two further reform processes since then, and international negotiations on biodiversity use and conservation have continued indefinitely. Many of the issues discussed in this study remain unresolved, and new issues, such as the use of genetic sequence data, have arisen. Nonetheless, the study intends to contribute insights into factors influencing policy directions relating to PGR, which can illuminate ongoing debates.

Further limitations, particularly those imposed by the research approach, are discussed in Chapter Four.

1.4. How the thesis is structured

Chapter Two sets out the context for the thesis by exploring the literatures related to the research topic. It describes contestation between models of agricultural development espoused by a range of stakeholders. It further describes the place of IAR in those debates, including perspectives on new forms of crop development, the influence of biotechnology, the entrance of commercial actors into the agricultural research sector and the related expansion of intellectual property (IP) rights to protect new crop varieties. It outlines the international frameworks relating to access to, and use of, PGR and the interaction between them.

Chapter Three presents theoretical approaches to understanding the concept of 'global public goods' (GPGs). It describes the development of a diversity of definitions and their practical application. It considers the relevance of debates about understandings of the GPG concept to the thesis' topic.

Chapter Four presents the conceptual framework of the thesis, states the research questions and lays out the methods employed to address them. It presents the main case study – CGIAR’s approach to its ‘public goods’ mandate as enacted through its approach to PGR management. It describes how the main case study will be examined through sub-cases focusing on key time-periods. It explains the methods for data collection (archival research supplemented with key informant interviews) and analysis (narrative analysis), including some limitations of the chosen approach.

Chapters Five, Six and Seven present an account of CGIAR’s policy processes on PGR and IP, their interactions with each other, with changing approaches to its public goods mandate, and with evolving global frameworks governing PGR management from 1990 to 2012. Policy making processes are examined, including which stakeholders were involved, what views they held, and what power they were able to exercise to shape policy decisions.

The account is based on empirical evidence from contemporary documents such as minutes of meetings at which policies were decided. It also draws on interviews with several key protagonists, academic observers and analysts. The chapters describe how CGIAR navigated its way through changing regulatory frameworks and regime formations, and what its role was in supporting or challenging the direction of change in the global agri-food system. This history is presented chronologically, focussing on key moments in time when possible alternative directions for agricultural research were debated.

Chapter Eight interprets the findings from the empirical chapters in terms of the conceptual framework described in Chapter Four. It highlights recurring themes across the sub-cases and considers their implications. It provides answers to the research questions, evaluates the usefulness of the conceptual framework and presents the contributions of the thesis. It concludes by presenting brief recommendations for policy makers and for further research.

2. Research context and background

2.1 Introduction

This chapter sets out the context for the thesis by exploring literatures related to the research topic. It provides a brief overview of debates about different models of agricultural development and the role of international agricultural research (IAR) in relation to alternative models. It considers how IAR has shaped, and been shaped by, different development approaches. It examines the impact of key changes in agricultural research systems, including the development of new technologies, the increased engagement of private actors in IAR and the expansion of intellectual property (IP) regimes into the agriculture sector. It explores contestations over the value and use of plant genetic resources (PGR) in these changing structures, and different perspectives on PGR management and related scientific and traditional knowledge. It provides an overview of global regulatory frameworks affecting PGR use, exchange and management. Finally, it presents a brief introduction to CGIAR's role in these debates.

2.2 Alternative framings of agricultural development

Since the 1940s agricultural development policy for low-income countries (LICs) has been dominated by a model – often termed a ‘productivist’ approach – which has focused on increasing production and productivity as the key to reducing hunger (Thompson and Scoones, 2009; Lang and Barling, 2013). This approach fitted with prevailing approaches to ‘development’, aimed at industrialising the economies of LICs (Wiggins et al., 2013). In order to feed growing urban and rural populations, agricultural production had to increase, and agricultural research was directed towards this end. The Green Revolution (GR) technologies of high-yielding varieties of staple crops arose from, and supported, a model of state-led development aimed at national economic growth (Feldman and Biggs, 2012a; Sumberg et al., 2012).

The technological changes of the GR led to social changes, as state subsidies for support infrastructure such as roads, irrigation and markets were only provided in higher potential, richer regions, thus increasing inequality (Feldman and Biggs, 2012a). The economic benefits of GR technology were not equally distributed, with landless labourers and farmers working on marginal lands excluded. Wiggins et al. (2013) argued that these (and subsequent) agricultural policies have often led to financial gain for larger-scale farmers who are more able to capture the benefits of state subsidies.

However, from the 1980s, a neo-liberal agenda often led to the removal of state subsidies for agriculture and agricultural research in low-income countries. Corporate ownership and integration in the agriculture sector increased, along with the expansion of international trade in agricultural commodities. Global trade liberalisation policies began to shape agricultural policy in low-income countries, and the idea of food security through trade rose up the policy agenda (Lee, 2013). This discourse was formalised in global governance structures through the inclusion of agriculture into the WTO in 1994.

The ideology of trade liberalisation that underpins the WTO treaties, when applied to the agriculture sector, promoted a shift in agricultural systems away from support for subsistence production towards supporting export-oriented production, and the promotion of policies aimed at securing food security through trade. The impact of this approach to agricultural development in countries of the South has been profound, reshaping rural economies (Feldman and Biggs, 2012a). Agricultural outputs in LICs are now often the raw materials for a global market in processed foods. The type of product produced, where, how, by whom and for whom, have all been affected by the integration of agriculture into global markets. Inputs to the agriculture system, including research, have also become geared towards the incorporation of agricultural commodities into global food value chains. Powerful development donors have supported this approach, which is now dominant in the discourses of institutions such as the World Bank, WTO, USAID and DFID (e.g. DFID, 2015; USAID, 2020).

However, such globalisation processes have often had a negative impact on food security for poor and marginal communities in countries of the South (Madeley and Solagral, 2001, Macdonald, 2010). In these new economic arrangements, "...agricultural production is characterized by global patterns of inequality." (Clapp, 2009, p.161). This raises questions about whose interests are served when 'development' becomes synonymous with the privatisation and marketisation of the agriculture sector.

Policy makers who champion the role of the private sector in delivering food security often do not explicitly take into account power relations within the food system and barely engage with the role of trans-national corporations (TNCs) at the global level or in policy processes. Instead, the productivist trade-based approach is inexorably linked with support for business-led delivery of food system outcomes. Market-based approaches assume that the private sector is best placed to deliver increased productivity (and therefore food security); and they also assume that desired development outcomes have technical or managerial solutions (e.g. WEF, 2010).

Market-based approaches have also led to policy-making on agriculture in isolation from other factors affecting rural livelihoods. Feldman and Biggs (2012a) suggested that a narrow understanding of rural livelihood strategies leads to conflicts between policies to increase production and those to increase incomes. Wiggins et al. (2013) noted that there are often different policy goals relating to agricultural development, rural development, food and nutrition security and addressing rural poverty. A lack of clarity about the different policy goals has led to inconsistent and contradictory policies, as the separate goals of economic growth and ensuring food security have been conflated. Nonetheless, the framing of addressing food security through economic growth has remained remarkably resilient in the face of contrary evidence and critiques.

Proponents of Food Regimes (FR) theory provide a historical perspective on the development of the global food system. FR theory describes "...patterns of circulation of food in the world economy..." (McMichael, 2009, p.140) in relation to their drivers and their consequences. It highlights the links between food production, trade, consumption and geo-political interests of diverse stakeholders. Food regime theory is also concerned with the relationship between food regimes and 'development'.

Friedmann and McMichael (1989) described three historical periods during which distinct forms of organisation of the global agri-food system could be identified.

The first global food regime, from 1870 to the 1930s, developed in conjunction with colonialism and British imperial power. Key features of this regime were the export of staple crops, mainly from USA and Australia, enabling urbanisation and industrialisation in those countries and in Europe (Pistorius and van Wijk, 1999).

The second regime, from WW2 to 1980s, was established soon after the end of WW2, but from the late 1950s onwards developed in parallel with de-colonisation and the Cold War. It was characterised by the increasing development of industrialised agriculture, 'productivist' approaches to agricultural and food policy, and the rise of food aid as an instrument of both foreign and domestic policy.

The third regime arose in response to food price crises in 1970s, which reinforced 'productivist' approaches in government policies. The regime was shaped by the partial retreat of states and their "...replacement by the market as the primary organizing principle of global power relations." (Buck, 2014 p.54). Other elements included the rise of TNCs and increased financialisation of global food commodity markets (Burch and Lawrence, 2009) and consequently increased speculative market transactions.

However, there is some debate over whether a third regime has in fact emerged, or whether globalisation processes can be seen as a continuation of the second regime (Burch and Lawrence, 2009; Friedmann, 2009). Nonetheless, McMichael (2009) described a third food regime – the ‘corporate food regime’ – which builds on the privatisation and global integration of multiple aspects of the food system.

McMichael’s analysis of the changing relationship between corporate actors and ‘development’ remains relevant, as donors increasingly seek to enlist private sector actors to deliver development outcomes (e.g. DFID (2017)).

Buck (2014, p.52) similarly described the “neoliberal food regime” as one in which the global agri-food system is being oriented “...toward the market as the only pathway for food.”

“The neoliberal food regime is...predicated primarily on the expansion of global markets, facilitated by rapid and increasingly volatile global flows of capital and by the reorientation of state functions toward accelerating rates of production and of capital accumulation.”

Buck further considered the increased privatisation of formerly public goods as a key element of this process, which she termed a process of ‘enclosure’. This term describes

“...the mechanisms by which goods, both material and immaterial, are transferred by noneconomic force from the non-market sphere into the market sphere as both commodities and raw materials for capital accumulation.” (Buck, 2014, p.55)

She suggested that this has led to corporate concentration, and limited regulatory control over the operations of TNCs.

At the same time, the prevailing regime is resisted by the rise of social movements concerned with social, environmental and food democracy issues, such as the Food Sovereignty movement, and the Right to Food movement (Holt Giménez and Shattuck, 2011). These movements (along with environmental pressures) challenge the power relations within the dominant regime and potentially undermine it. They aspire to make explicit and to contest the socio-economic, political, cultural and power dimensions of hunger and poverty. They demand, or at least imply, a more holistic understanding of agricultural production systems, taking into account social, cultural, economic and environmental aspects of multiple food systems in diverse contexts.

The concept of Food Sovereignty was developed as a response to the inclusion of food into the WTO in 1994, and was launched by Via Campesina at the World Food Summit in 1996. The concept arose from, and is framed by, opposition to the dominant agro-industrial paradigm. Proponents aimed to challenge the narrative of globalisation and trade liberalisation as the

means to achieve food security, and instead described a 'localisation' approach which seeks to integrate contextual factors into policy options for agricultural development.

Advocates of food sovereignty argue that producers should have more control over the means and methods of production. The approach incorporates concepts of sustainability and equity within it by asking questions about how food is produced, what food, for whom and by whom in order to meet household, national and global food security needs. It is an overtly political movement, concerned with the power and politics of food system functioning (Patel, 2009).

The Right to Food (RTF) approach also considers power relations in the system, alongside the legal frameworks associated with the delivery of a range of rights relating to production and consumption. Proponents argue that examining policy choices through a 'right to food' lens, shifts approaches to social protection from one of charity to one of legal responsibility, including redress when rights are not provided (De Schutter, 2013).

Linking both approaches is support for the concept of agroecology, which De Schutter (2014, p.9) defines as:

“...a range of agronomic techniques...that reduce the use of external inputs and maximize resource efficiency.”

Both approaches consider agroecology to be the most appropriate agricultural production method to achieve their goals, because it is locally-adaptable and seen as a means to protect biodiversity, diverse diets and traditional knowledge while supporting rural livelihoods. Such an approach builds on local knowledge being used in context, rather than seeking technological solutions that can be applied 'at scale' (Lang and Heasman, 2004).

Both approaches also share a normative position regarding the distribution of benefits from the food system, the difficulty of ensuring equity through market-based approaches to food security and a belief that the only way to address food insecurity is through strengthening the ability of small-scale farmers to produce for themselves. They both call for democracy within the food system, and highlight the need to ensure rights of access to productive resources.

The dominant model of securing food security through trade was challenged by the food price crisis, which started in 2007. Food prices on global markets increased rapidly, leading to riots in many food importing countries, and disruption of commodity trading as food-exporting countries closed their borders to retain their own food stocks. Food prices decreased in 2009, but rose to even higher levels in 2011 (Wise and Murphy, 2012).

For critics of liberalisation and trade-based approaches to food security, the food price crisis threw into sharp relief problems with the way in which the food system operated, including

the failure of the 'productivist' paradigm to deliver a reduction in hunger and poverty (Lang, 2010) and the unequal distribution of economic power (McKeon, 2011).

The food price crisis triggered a plethora of policy initiatives, reviews and foresight exercises (e.g. the reformation of the Committee on World Food Security in 2009, the Global Agriculture and Food Security Programme (2010), the G20 Action Plan on Food Price Volatility and Agriculture (2011), the World Economic Forum New Vision for Agriculture (2010)). These initiatives indicated a consensus on the need for change in the food system, but multiple views on what that change should be.

Views presented across the different initiatives broadly aligned with long-standing positions in debates between different models of development. The range of perspectives can be characterised as reinforcing existing 'productivist' and market-based paradigms or articulating 'emerging' paradigms which could challenge dominant approaches (Lang and Barling, 2012).

The food price crisis created the political imperative to question food system functioning but policy debates post-2008 replayed ongoing arguments. The World Bank, WTO, G20 and others sought policy approaches to make the food system more stable and resilient to future crises, within existing global economic neoliberal parameters. They reinforced productivist approaches by incorporating narratives about smallholder livelihoods and environmental sustainability that first emerged from alternative and participatory approaches in 1980s and 90s. Conversely, proponents of 'emerging' approaches explicitly challenged the direction of 'progress' and called for food policy to focus on goals of social justice, human rights and environmental sustainability. Those perspectives have been articulated by the Committee on World Food Security (CFS), IAASTD and the UN Rapporteur on the Right to Food, as well as many civil society groups and NGOs.

Debates about agricultural development continue to evolve and new concerns emerge. Nonetheless, there are two broadly recognised contested framings of how the global agri-food system operates and should operate; and models of agricultural development associated with these positions. These have been characterised by IAASTD as "...two relatively independent pathways to agricultural development...", globalisation and localisation (IAASTD, 2009a, p.147). IAASTD described globalisation approaches as focusing on aggregate global levels of food production and integrating global markets; and localisation pathways focusing on social, cultural and environmental issues in local contexts alongside technical agricultural production concerns.

The next section considers literature exploring the role of agricultural research within the context of these generally recognised models.

2.3 The role of IAR in agricultural development

Authors who have considered the role of agricultural research in development have examined how research priorities both shape and are shaped by framings of development and have shifted over time accordingly. Evenson (2004) identified five technological shifts affecting the agriculture sector in LICs. He characterised them as:

“...agricultural mechanization, agricultural chemicals, crop genetic improvements (the Green Revolution), livestock industrialization, and recombinant DNA (rDNA; the Gene Revolution).” (Evenson, 2004, p.189)

He considered that they had all originated in the global North and been transferred to LICs, but they differed from each other in how that transfer had taken place, the public sector role in developing each technology, and the role of IP regimes in each.

Hall et al. (2000) analysed the relationships between changing development priorities and agricultural research approaches. They argued that when public IAR bodies were established, and Green Revolution (GR) technologies were developed, there was a clearly-understood relationship between the goals of agricultural research and the goals of development i.e. that agricultural research would increase agricultural productivity to reduce hunger. They further argued that:

“The institutional arrangements to achieve this goal were consistent with prevailing ideas concerning the organization of science and its relationship with innovation and economic production; namely that centralized scientific research institutes could solve the generic problem of increasing the biological potential of important food crops and that this would lead to increased food production.” (Hall et al., 2000, p.72)

Hall et al. argued that public IAR systems were shaped by their origins in US foreign policy concerns to reduce hunger in Asia and therefore reduce the risk of political instability. They argued that the Rockefeller Foundation (RF) shaped the direction of agricultural research by focusing on developing technologies to increase agricultural productivity, particularly yield per hectare. The approach was based on extracting relevant traits from crops found in farmers’ fields and producing higher yielding varieties by inserting those traits into ‘improved’ seeds that would replace the farmers’ varieties.

“Complex issues associated with farm size, access to inputs, applicability and socio-economic relevance were placed to one side in order to focus thinking and resources on the one key objective, transforming agricultural productivity by means of improved germplasm. The focus was on so called *isolable* technical problems - isolable in the sense that they could be isolated from the socio-economic context of farmers and the political context of target countries.” (ibid p.74)

They considered that, while conceptualisations of development and related policy priorities had extended since the GR, IAR institutions had not similarly broadened their research targets. Instead, they retained “...rather simplistic assumptions concerning the linearity of relationships between public investments in the creation of new technology and poverty reduction...” (ibid p.72).

Piesse and Thirtle (2010), Renkow and Byerlee, (2010) and Pingali, (2010) all described the pipeline model of agricultural research adopted by CGIAR at its inception, and still in place in 2010. In this model, industrialised countries provided research and new technologies at the top of the pipeline. These new technologies could be passed down to farmers in poor countries to enable them to increase their yields.

This ‘pipe-line model’ assumed a separation of knowledge generation from knowledge transfer and application (Hall et al., 2000). This meant that research priorities were set by scientists, and farmers were only brought into the process when delivery mechanisms were being developed (Scoones et al., 2008). Millstone et al. (2009) argued that this approach failed to provide any mechanisms for farmers to input into the research process or feed back to researchers on the usefulness of interventions.

Smith (2009) argued that specific narratives about development, and about scientific research in support of different approaches, have shaped decisions about agricultural research over a long period of time. She examined the RF’s funding of research on rice, starting by describing its key role in the 1970s in funding the development of GR technologies. She then described its support of biotechnology in the 1980s. She argued that RF’s framing of biotechnology as cutting-edge research necessary to develop improved rice varieties was highly influential in shaping the direction of rice research. In particular, she argued that its funding of this approach led to biotechnology researchers – rather than rice researchers – shaping the research agenda. This led to a shift in the form of research on rice, its geographical location and the actors conducting it.

Smith argued that, as a result, decisions about the direction of technology development for rice were taken in isolation from the intended end-users, and with no input from people living in rice-consuming countries, who had been growing hundreds of different rice varieties for centuries. This approach to IAR privileged Western science-based forms of knowledge over local or traditional knowledge, and situated the science needed for food production internationally.

Smith reported that research priorities were set by rice breeders and economists working to identify traits to be developed. This approach led to a conflation of specific and global problems: for instance, a pest in Asia became globally important because of the number of people affected, even if it was not an issue in Africa or Latin America. The process of averaging out removed context and at the same time applied context universally.

Brooks (2011) also argued that models of development have shaped directions of agricultural research. She considered that the historical context that gave rise to the Green Revolution and its institutions (i.e. CGIAR Centres) has been mirrored by more recent narratives of development. In particular, global framings of development, as articulated through the Millennium Development Goals, and processes of globalisation have enabled a resurgence of global approaches to development problems. She argued that ‘philanthrocapitalists’ such as the Bill and Melinda Gates Foundation (BMGF) have supported a renewed focus on “...the power of breakthrough science to solve intractable global problems.” (ibid p.75). This has enabled CGIAR to continue to prioritise research aimed at addressing generic problems and producing technologies for application ‘at scale’.

However, Brooks and Johnson-Beebout (2012)’s study of biofortified rice revealed the limitations of such decontextualised research. They described the development of a high-iron rice variety to address iron deficiency across large areas of Asia, where rice is a staple crop. During its development process, researchers found that iron levels recorded in laboratory conditions were not replicated when the crop was grown on farms, and there was significant variation in iron levels depending on agroecological conditions.

This research demonstrated that crop traits cannot be assumed to be equally applicable or relevant in all contexts; and linear conceptualisations of the relationship between scientific research and development outcomes might not be accurate. As a result:

“...some agronomists began to question the wisdom of privileging a genetic-led approach to biofortification.” (Brooks and Johnson-Beebout, 2012, p.92)

IAASTD (2009) questioned whether technologies developed for industrialised country contexts would provide benefits appropriate to the needs of farmers in LICs. The authors considered that the benefits of agricultural research had been unevenly distributed, because choices about priorities for research and investments had been based on a development model designed in industrialised nations. They considered that research processes should engage with local knowledges, cultures, interests and ecosystems to ensure the production of outputs relevant to end-users in diverse contexts.

2.4 Impact of market liberalisation and an expanded private sector role in IAR

As Evenson (2004) explained, the public and private sectors played different roles in agricultural research at different times. Market liberalisation policies and the development of IP regimes in the 1980s led to increasing involvement of the private sector in agricultural research, particularly in commercially viable areas such as improved seeds (Meinzen-Dick et al., 2003). However, there was less private investment in areas of agricultural research with no market value, such as natural resource management.

This was highlighted by Vanloqueren and Baret (2009) in their examination of factors shaping agricultural research trajectories. They compared the different ways in which genetic modification (GM) and agroecology have developed. They described the scientific and technological paradigms embodied by the two approaches: ecology which considers the whole agricultural system and the interactions between different elements of it (seeds, soil, people) to ensure a productive system; and genetic engineering which considers elements of an agricultural system separately and aims to improve the productivity (or other quality) of single elements. They argued that there are “determinants of innovation” which shape a technological regime. These include science policies, which have become “...explicitly and increasingly oriented towards growth and national competitiveness.” (Vanloqueren and Baret, 2009, p.975). These policies lead to investment in resources such as specialised research labs, which support molecular biology but not agroecology.

They (and others e.g. Stone, 2010) identified shifts in the relationship between public and private research which, they argued, had influenced decisions about technological trajectories. They particularly highlighted “...the increased influence of industry through public–private partnerships...” over agenda setting for agricultural research (Vanloqueren and Baret, 2009, p.976). This influence arose because private sector (PS) actors engaged in partnerships to develop technologies that they could monetise e.g. genetic engineering.

Vanloqueren and Baret argued that the private sector’s interest in pursuing research agendas that could lead to commercialisable products skewed research agendas away from innovations that create benefits that cannot be appropriated (such as improved biodiversity). They argued that this has directed research funding and effort towards biotechnology research and reduced the resources available to develop other potentially valuable technological trajectories.

Additionally, public sector researchers have had to shift their priorities to fit with approaches to agricultural development premised on the belief that “...markets are the most efficient way of allocating resources and hence of achieving the greatest public good...” (Sumberg et al.,

2013, p.73). In this context, research leading to economic growth can be considered to be 'public good' research. As a result, public sector researchers have sought "...to define the public good as research that leads to the creation of commercialized products, narrowing the definition of the public good towards private goods..." (Vanloqueren and Baret, 2009, p.396). Questions of who benefits from those products (and more broadly from generic economic growth) are often not addressed. Debates over how 'public goods' might be defined are explored further in Chapter Three.

Smith (2009) argued that the use of economic metrics (e.g. cost-benefit analysis and 'return on investment' calculations) to evaluate the relative usefulness of different crop traits fitted well with a neoliberal model of agricultural development which "...treats biological components – or traits – as if they are commodities." (Smith, 2009, p.471). If all traits are given a monetary value, they can be measured against each other, but only at a global level. "Traits...are, in essence, made into a form of capital." (ibid). Decisions about which traits to work on can be "...integrated into the production and expansion of capital markets." (ibid) Smith argued that this shift fitted into the neoliberal model of the 1990s, which reframed the role of markets in development policy, and placed science and technology at the service of market growth, rather than social transformation.

For instance, proponents of technocratic and trade-based approaches to food security (e.g. WEF, 2010) have focused their policy recommendations on increasing smallholders' productivity and integrating smallholders' produce into global value chains. They considered that the persistence of poverty and hunger among small-scale farmers in LICs could be addressed through technocratic and managerial solutions. In this model, smallholders are seen primarily as producers of commodities for the world market (Feldman and Biggs, 2012a). Research priorities to support this model might include improved seeds or precision irrigation. Conversely, IAASTD (2009b) specifically critiqued the technical fix approach to agricultural science and instead called for research and technology at all scales to take into account the societal outcomes of technological interventions.

The 2007 food price crisis gave new impetus to productivist approaches to agricultural development. McMichael and Schneider (2011) described the dominant discourse that arose after 2008: after a period of neglect of the agriculture sector, public investment was needed, particularly to increase the productivity of smallholders. This would increase global food supplies, thus keeping prices low and averting a future food price crisis. It would also enable smallholders to participate in, and benefit from, global markets.

McMichael and Schneider argued that this model of development required foreign investment into the agriculture sector of developing countries – particularly in Africa, which was the focus of initiatives such as the Alliance for a Green Revolution in Africa (AGRA). This involved a reshaping of African agriculture to make it more attractive to investors, specifically the opening up of agriculture input markets in African countries. The privatisation of research outputs (through patents) was part of this process.

They argued that the difference between the Green Revolution, and the AGRA initiative was that in the former, states continued to produce for domestic consumption, even if inputs and technologies were international. In the latter, produce is destined for global markets, not domestic food security, so both inputs and outputs of the agriculture sector are international. They argued that agricultural research has similarly shifted its priorities to serve the changed agricultural development model.

Newell et al. (2018) similarly identified a range of initiatives including Grow Africa, the New Alliance for Food Security and Nutrition, and AGRA

“...which seek dramatic shifts in production, technology, and financing, with an explicit preference for market-led agricultural development. Their diagnosis of the problem is a deficit of private capital, conducive regulatory and legal frameworks, and investment in research and infrastructures of interest to investors.” (Newell et al., 2018, p.63)

The authors argued that such approaches support “...the a priori goals of accelerating export-led growth...” i.e. that agricultural research is being restructured to meet the needs of the dominant agricultural development model.

Bhutani (2013) examined the changing shape of public IAR in south Asia, the factors and actors creating the change, and the consequences for agriculture systems across the region. She argued that international policy framings were changing the shape of agriculture in the South Asian countries she examined:

“In a globalised world, it is increasingly external actors – intergovernmental bodies and multinational corporations – who appear to be setting the rules. They are re-orienting agriculture as well as R&D. The focus is on market-driven products, processes and services.” (Bhutani, 2013, p.4)

She argued that one result of this has been the privatisation of previously public research. She argued that international trade rules (e.g. WTO rules) and policies to encourage foreign investment (e.g. the World Bank Doing Business Index) place small farmers at a disadvantage. Such processes create incentives for pro-trade development policies, market liberalisation and commercial agriculture. Inevitably, resources and policy interest focus on these forms of agricultural development and voices calling for different approaches are marginalised.

Bhutani argued that, in this context, CGIAR had developed new relations with commercial actors:

“From playing a support role in public agriculture, the group has (re)positioned itself to play a more frontal role in agricultural R&D across the globe. In doing so it has chosen to partner, rather than compete, with the corporate private sector.” (ibid p.8)

Sumberg et al. (2013) identified the development of IP regimes at a global level, and increased private sector involvement in crop development, as having an important impact on the direction of agricultural research, including on how public research bodies defined their role within the sector. They also considered the impact of increased environmental concerns, which led to the adoption of the Convention on Biological Diversity (CBD) and the FAO’s Seed Treaty; and the participation agenda, which raised questions about how agricultural research should be conducted and its relevance for end-users.

“Taken together these shifts have had important implications not only for what research areas or questions are prioritised by the public sector, but also for the choice of methods, research sites and partnership arrangements.” (ibid p.75)

The authors argued that, instead of opening up the practice of agronomy to new approaches, contestation was focused on a limited range of research agendas, such as biofortification and biotechnology (c.f. Vanloqueren and Baret, 2009). Echoing Smith (2009), they concluded:

“The result is the continued promotion of universal approaches to both policy and practice which obscure alternative framings and pathways, and downplay contextual factors.” (ibid p.77).

Sumberg et al. (2013) argued that governance processes of public agricultural research bodies have been one site of contestation over the function and form of agricultural research. Other authors also considered that CGIAR has had to respond to the changing role of private sector actors in agricultural research. Piesse and Thirtle (2010) reported that initially public sector research had focused on improving plant material, while the private sector focused more on machinery. However, this had changed as a result of the development of GM crops, which enabled the patenting of plant improvements. They considered that the development of GM technology also “...played a key role in moving the public-private boundary...” in agricultural research (Piesse and Thirtle, 2010, p.3043). They also argued that patents could limit diffusion and lead to market concentration, closing down options for research for those that do not own the patents. They were concerned that this shift in the locus of crop technology research would move the direction of research from a poverty reduction focus to a profit-making focus. Pingali (2010) similarly highlighted the impact of IP regimes, reporting that six companies held 75% of agricultural patents and their focus was on profit-making products rather than pro-poor interventions.

2.5 Changing approaches to the value of PGR

The public-private boundary in agricultural research was also a concern for Kloppenburg (2004). He examined political-economic factors shaping the use of PGR in crop development in the 20th Century. He described the centrality of diverse PGR as a resource for new crop development. He considered the relationship between the collection of PGR from locations rich in biodiversity, primarily in the global South, and the use of that PGR in crop development programmes conducted primarily in the North. He argued that:

“The flow of plant germplasm between the gene-poor and the gene-rich has been fundamentally asymmetric.” (ibid p.15)

He defined this asymmetry both in terms of quantity and in terms of the characteristics of the PGR flowing in each direction. Specifically, he argued that PGR has flowed freely from LICs to industrialised countries, but has flowed the other way in the form of new seed varieties i.e. commercial products for which farmers have to pay.

He argued that this process was facilitated by the establishment of the network of CGIAR genebanks. These enabled the collection of “...the exotic germplasm required by the breeding programs of the developed nations.” (ibid)

Parry (2004) similarly considered the relationship between collection and use of PGR. She argued that processes of collection have decontextualised seeds and enabled genebanks to “...control such materials within particular localities and systems of knowledge...” (ibid p.8). i.e. processes of collecting have placed how PGR has been managed, controlled and understood within Western scientific models of knowledge production. She considered the genebank model to be a central element of the process of internationalising knowledge for crop development described by Smith (2009).

Pistorius and van Wijk (1999) applied Food Regime theory to an examination of the political economy of crop development. They considered that conflicts over the governance and use of PGR, which arose in 1980s, could be best understood in the context of contestation over different models of agricultural development.

They argued that:

“...agro-food production can be organized in various manners, each manner bringing along a specific view on the function and the design of plant varieties and consequently also on their resources and exploitation rights. Thus, conflicting views on how agro-food production should be organized provoke conflicting perceptions of how genetic resources should be handled.” (Pistorius and van Wijk, 1999, p.3)

Therefore, the different, and changing, shape of agriculture across geographies and time has caused conflict about crop development processes and the management and use of PGR.

Pistorius and van Wijk argued that controversy over the use and ownership of PGR is part of “...a reaction against the overall industrialization, not only of crop development, but also of agriculture in general.” (ibid p.16)

By looking through the lens of different historical periods, they argued that conflict over different agricultural production strategies “...are induced by two factors: (a) the degree of capital involvement in agriculture and crop development in a particular period, and (b) the political dominance of some of the actors involved in agriculture in that period.” (ibid p.26)

Using this approach, they focused on the direct link between framings of agricultural development and forms of agricultural research. They contended that IAR is not neutral or objective, but situated in specific models of agricultural development that serve the dominant food regime at different moments in time.

However, Pistorius and van Wijk focussed their analysis on relations between states, and the international regulatory frameworks established to address their contrasting and competing interests. They did not consider in any depth the role of TNCs or corporate capture of public goods as described by Buck (2014). They were also unable to foresee the impact on IAR of technological developments, particularly in relation to the use of PGR. For instance, Pechlaner and Otero (2010, p.185) claimed that biotechnology has become “...the key technology driving capital accumulation in the neoliberal food regime...” and described the growing importance of intellectual property rules to protect this capital. The economic value of PGR has therefore gained importance under the prevailing corporate food regime.

PGR are important as objects with potential commercial value to plant breeders, but also provide multiple other values (e.g. social and environmental) arising from the existence of biodiversity (Swanson, 1996). PGR therefore has value as both a public and a private good. Its value to food and agriculture also has both public and private elements.

Lemaux (1999) and Evenson (2004) both examined the role of public research in relation to the development of commercialisable seeds, particularly in the light of biotechnology developments. They considered that public sector research played an important role in ‘pre-breeding’⁵ to ensure the maintenance of a wide genetic base from which private sector seeds

⁵ Most breeding uses already cultivated varieties because their qualities are already known. However, this reduces the genetic diversity of new crops. Pre-breeding activities identify useful traits in ‘raw’ PGR and transfer them to materials that breeders can then use to develop new varieties (Sharma et al., 2013).

could be developed. This work would not be conducted by private actors because it had no direct commercial value, but Lemaux argued:

“If this path is not followed, the genetic diversity of the germplasm used by the private sector and its suitability for certain environmental niches will be compromised.” (Lemaux, 1999, p.6)

However, Kloppenburg (2004) argued that this framing of the relative roles for public and private research was based on commercial interests only:

“The ‘proper’ role of public research is held to be the support of ‘basic’ investigations while, private enterprise pursues ‘applied’ problems. The terms ‘basic’ and ‘applied’ are misleading. The pivotal question has nothing to do with a particular type of science, but with proximity to and degree of control over the seed as a commodity-form. The parameters of this division of labor must continually be redefined as technological advance occurs and as private enterprise grows stronger.” (Kloppenburg, 2004, p.13)

Chiarolla (2011) observed that PGR consist of both material and informational goods. They are therefore both public and private goods, because the material – the crop – can be consumed, while the information it contains is knowledge that remains publicly available (at least to those with the capacity to access it). However, he recognised that developments in biotechnology had changed these relationships:

“The application of molecular genetics to agricultural research has transformed plant germplasm as a source of appropriable information.” (Chiarolla, 2011, p.36)

Parry similarly argued that biotechnology had significantly altered relations between the material and informational forms of PGR.

“Biotechnology has played a crucial role here, enabling the latter to be utilised independently of the former. Genetic resources may now be rendered in a variety of progressively less corporeal and more informational forms: as cryogenically stored tissue samples, as cell lines, extracted DNA, or even as gene sequences stored in databases. When in these new artifactual forms, genetic resources become infinitely more mobile and hence more transmissible.” (Parry, 2004, p.5)

She further argued that holding PGR in genebank collections facilitated processes of separating genetic material from genetic information.

Feindt (2013) and Henry (2013) similarly both argued that technological developments have changed the relationship between physical germplasm and the information contained in it, which may be of relevance to plant breeders. Feindt considered that PGR in the form of information was more likely to be the subject of IP claims. In addition, the separation of the material and informational forms of PGR might enable the transfer of valuable trait

information without transferring physical samples. Legal frameworks controlling the flow of PGR (e.g. the Seed Treaty – see section 2.7.2 below) have not kept pace with technological developments (Rhodes, 2016), and it is not clear whether IP rights apply when information, not seeds, are transferred between genebanks. Chiarolla (2011) also noted that access and benefit sharing (ABS) restrictions provided for under the CBD come into force when PGR leaves a country, so depend on its materiality. If information on relevant traits can be shared without sharing a physical object, then ABS restrictions may have no force. Parry (2004) was similarly concerned about the impact of this shift on ABS and ownership issues:

“Translating genetic resources into new, less corporeal and more informational forms might enable them to be circulated much more rapidly around avenues of exchange, but it also makes it much more difficult to keep track of where they go and who uses them.” (Parry, 2004, p.6)

This separation of genetic material and information raises wider questions about the form in which knowledge about PGR is held and shared. While farmers may be able to share seeds, and information about traits they contain, only scientists can use genetic information contained in genebank databases.

PGR for food and agriculture embody the knowledge of those who have cultivated them over centuries. However, formal IP regimes do not recognise this knowledge. With the application of IP regimes in the arena of food and agriculture, two different world views on information and knowledge have collided.

Gari (2001, p.3) argued that, with the CBD: “The issue of biodiversity conservation was globalised...” and a discourse on the global value of biodiversity developed. This is because biodiversity’s value derived from its use to biomedical and biotechnical research.

“...Biotechnological and agricultural corporations claim that their needs for biodiversity, in terms of the products they can develop from it, will provide the economic incentive to conserve biodiversity, as well as a fundamental benefit for humankind.” (ibid p.4)

In this way, the granting of IP rights over PGR is a prerequisite for both the production of new crops and the conservation of PGR on which future agricultural development will be based. Gari argued that these processes build on a global perspective: biodiversity has a global value as a resource in international markets. He argued that alternative understandings of biodiversity – as intrinsically linked to local environmental and cultural contexts – have been side-lined.

“Intellectual property rights encourage particular systems of managing both biodiversity and biotechnological processes at a global scale.” (ibid p.5)

Using quinoa as a case study, he described how indigenous communities used biodiversity as part of a wide-ranging “agricultural infrastructure” (ibid p.7) developed to improve food security. In their systems, different varieties of quinoa serve different purposes and biodiversity conservation is intrinsically linked with the use of the plants, and with food security. He argued that peasants’ “...traditional ecological practices comprise very active processes of *in situ* research, conservation, and innovation over biodiversity.” (ibid) These are linked to cultural practices in those communities, including sharing of resources and associated knowledge.

Thus, granting patents undermines indigenous knowledge-sharing practices that have led to agricultural innovation and instead “...strengthens and spreads the Western paradigm of nature and science...”, locating research away from the agroecological zone from which the plant originates.

“The collective management of both biodiversity and knowledge among the Andean peasants is largely undermined by the global privatisation of biodiversity and knowledge. In the global research centres, the biodiversity of quinoa becomes decontextualized. It may return to the Andean communities, but in the form of a commodity.” (ibid p.9)

Gari argued IP regimes put in place a model of biodiversity conservation and research that ignores and undermines indigenous community practices. He considered that indigenous communities engaging with IP will rarely, if ever, do so from a position of power and are likely to remain marginalised in a regime developed within, and for, market-based systems. He argued that potential development benefits for indigenous communities are therefore unlikely to be realised.

Chiarolla (2011) argued that IP systems might undermine local food security, because the sustainability and resilience of a crop-based agriculture system depends on access to diverse seeds. In LICs these are most often provided through informal seed systems. He argued that:

“... in informal seed systems, the conservation, development and use of crop diversity and seed production are integrated components of farming systems.” (Chiarolla, 2011, p.52)

An IP system that limits the ability of farmers to undertake this range of activities could lock farmers into formal seed systems, which provide a narrower range of seeds, therefore limiting agrobiodiversity and possibly food security.

Tobin (2013) argued that the notion of IP is antithetical to protecting indigenous rights because it creates a dichotomy between natural and cultural heritage, which is alien to many indigenous cultures. Thus its imposition distorts indigenous relations with the environment.

However, appropriate forms of protection for indigenous knowledge have not been developed.

Not only is Traditional Knowledge (TK) not protected, but the contribution of TK to crop development and biodiversity conservation has not been recognised, and farmers have not been compensated for their knowledge (Chiarolla, 2011). Although Article 9 of the Seed Treaty includes Farmers' Rights as a legally recognised concept, little progress has been made towards its implementation.

Instead, Tobin (2013, p.78) argued, the poorest farmers, who are not able to afford commercial seeds, play an important role in preserving agrobiodiversity, and are in effect "...subsidizing global crop conservation."

Chiarolla (2011) examined global regulatory regimes affecting use and ownership of PGR. He observed the possible conflict between PGR as a resource for agriculture, and PGR as biodiversity and questioned the appropriateness of international legislative frameworks to manage the dual role. He argued that legal frameworks on PGR governance had not taken development needs sufficiently into account. He argued that it was vital to do so, because of the importance of PGR governance for food security, for the distribution of agricultural resources, and for the outcomes of agricultural research.

Tobin (2013) examined the boundary between regulations on PGR ownership and human rights law. He argued that the expansion of private rights into previously public arenas had a particularly detrimental impact on people who depend for their livelihoods on access to the commons e.g. through traditional land rights or use rights. He suggested that there was a growing coalition of actors who were coming together to "...resist the continuing enclosure of the commons." (Tobin, 2013, p.76).

Tobin, like Chiarolla, considered that IP regimes in the seed sector were potentially detrimental to agrobiodiversity and to food security. He argued for the development of alternative legislative approaches to protect PGR commons, associated knowledge, and other resource commons.

Conversely, other authors examining the potential impact of IP regimes in PGR on food security argued that crop development using biotechnology is necessary to meet future global food demands, and IPRs are necessary to ensure incentives to develop new crops. Therefore IP rights are needed for food security (e.g. Lemaux, 1999; Henry, 2013).

Lemaux (1999) discussed the impact of biotechnology on shifting relations between public and private actors. She started from the assumption that biotechnology was necessary for future

crop development, and that public bodies should engage in biotechnology research. However, she argued that biotechnology methods were much more expensive than conventional breeding methods. This meant that private companies needed high levels of investment, and guarantees of future profits before commercial development could begin. This in turn required IP protection for both research products and the techniques and processes used in genetic engineering. As a result, if public sector actors wanted to participate in biotechnology research, they had to engage with IP regimes, at least to gain access to technologies and processes developed by the private sector.

Lemaux additionally urged public bodies to take out patents to protect public research i.e. defensive patenting. She recognised the political questions arising from IP use:

“Questions of ownership and control over biological resources will be the basis for political and economic skirmishes and will influence how effectively this valuable resource is used and conserved. The manner in which these issues are resolved will affect the way in which the benefits of diversity are shared.” (Lemaux, 1999, p.4)

However, she did not explore these political and ethical considerations further.

Stone argued that biotechnology research has both created, and been the beneficiary of, a shift in the relationship between public and private knowledge creation, and that this has “...had profound consequences for research priorities in biotechnology...” (Stone, 2010, p.385).

He argued that the rise of biotechnology has been part of a broader process of change in agricultural production systems, and that trajectories of agricultural research and technology development fit into wider historical shifts.

“One such trajectory is the progressive commodification of agriculture; ...Another trajectory is the ongoing enclosure of the genome; genetic modification facilitated and was facilitated by patenting of life forms. ...Another trajectory is the march of neoliberal economics; ...” (Stone, 2010, p.384)

Along with others (e.g. Feldman and Biggs, 2012a), he highlighted the ways in which technocratic framings hide political-economic concerns. He argued that a technocratic framing puts GM as the next logical step in a trajectory of scientific processes of plant development. Conversely, political economy framings place GM in “...the context of expanding corporate control over agriculture” (ibid).

Stone acknowledged the impact of the rise of biotechnology in crowding out other innovation trajectories, and also argued that within biotechnology research itself, funding has prioritised the concerns of industrialised agriculture over those of small-scale farmers in the global South.

Similarly, Cullet (2004) argued that biotechnology has not generally been directed towards the needs of smallholder farmers, and therefore questioned its relevance for reducing hunger.

Chiarolla (2011, p.33) questioned whether the application of IPRs helps or hinders “...effective crop research and domestic innovation that is suitable for developing countries’ agriculture.”

Lesser (2016) and Louwaars et al. (2005) both considered that evidence of the relationship between IPRs and innovation in crops was unclear and therefore the impact on food security was unclear.

However, claims about the value of biotechnology to food security have justified changes in IP rules and policies surrounding new seed technologies. These changes have opened up African markets to commercial seed companies, a move promoted by initiatives such as AGRA and New Alliance, as a means to increase agricultural productivity. These claims are hotly contested by anti-GM groups, proponents of food sovereignty and groups concerned about biodiversity (La Via Campesina, 2013). Nonetheless, the development of GM technology has spurred the privatisation of new elements of the food system and bolstered the ‘productivist’ market-led narrative, often through the use of the language of ‘sustainability’.

2.6 CGIAR, IP and global public goods (GPGs)

Muraguri (2006) examined the use of IP by CGIAR centres. She asked whether the public or private sector should provide public goods, and whether using IP conflicted with CGIAR’s role as provider of public goods. She asked:

“How does a public research organisation apply IPRs (which introduce excludability) while still maintaining their mandate to provide goods equally available and accessible to all?” (Muraguri, 2006, p.6)

Muraguri argued that the use of IPRs can skew research priorities towards products of commercial interest. Additionally, with far greater resources for agricultural research available in the private, rather than public, sector, research into less commercially valuable crops is limited.

She examined the CGIAR IP principles in place at the time, and asked what rights and obligations CGIAR had over the PGR it held in its collections. She concluded that policy was unclear and key concepts, such as the notion of holding materials ‘in trust’ were poorly understood and implemented.

Cullet (2004) and Chiarolla (2011) similarly argued that CGIAR was expected to find a balance between two different approaches. It had to fulfil its GPG mandate through safeguarding free access to PGR and research outputs; but it also had to judge when the use of IP for its own research, or to access IP held by others, would better fulfil its mandate to provide public goods.

Sherman (2013) examined changing approaches to IP in public IAR bodies. He argued that, although IP rights had initially been seen as either irrelevant to public sector goals, or a barrier to their achievement, publicly-funded research bodies have had to respond to the expansion of IP into agricultural research. Sherman (like Muraguri and Cullet) recognised the conflict between public good provision and IP frameworks. He argued, however, that CGIAR had reconciled the two systems by reframing its public goods mandate.

He examined changing approaches to IP in CGIAR to suggest how this reconciliation had taken place. He described how CGIAR had initially considered IP regimes as potentially limiting its ability to keep its research in the public domain, or to access technologies needed for its research. He then traced the way in which this “...traditional approach...has slowly been undermined” (Sherman, 2013, p.25) as Centres engaged with IP issues.

Sherman (and Brooks, 2011) identified the development of CGIAR’s multi-partner programmes (the Challenge Programmes and later, the Research Programmes) as a catalyst for greater use of IP by CGIAR. These partnerships made it necessary to clarify the legal relationships between all the partners, and the status of IP owned by different partners.

Sherman concluded that there had been a “...transformation in the role of IP...” (ibid p.38) in CGIAR over the previous decade, and that CGIAR has been working to diminish what he termed the “unresolvable tension” between the “...goal of publicly funded research...” – which is to create research results in the public domain that are freely available – and the purpose of IP law which is “...fundamentally opposed to free and open access.” He stated that CGIAR had managed to resolve this tension by redefining both concepts.

‘Public goods’ had been redefined “...when the focus of attention shifted away from research results as ends in their own right towards maximizing the impact of that research.” (ibid). IP was also redefined as a tool for “...achieving goals such as reducing poverty and improving food security.” (ibid)

It is open to debate whether these shifts were anything more than a discursive sleight of hand. Sherman did not examine the implications of those redefinitions for research priorities. It should also be noted that Sherman was an author of CGIAR’s 2012 Principles on the Management of Intellectual Assets (CGIAR Consortium Office, 2012a) i.e. he was an active participant in the process he described. These processes are explored in depth in Chapter Seven.

Bhutani (2013) also examined CGIAR’s 2012 IP policy but, in contrast to Sherman, she considered that it enabled (rather than guarded against) private use of public research

outputs. She considered that, in seeking new funding sources, CGIAR has had to sign up to terms set by private partners, including “exclusivity principles” (ibid p.14).

In contrast to Sherman, who focused on CGIAR’s reframing of IP, Bhutani raised questions about how public goods are understood and who is involved in defining them, arguing that:

“If AR4D is to work for the people, what is ‘public interest’ and ‘development’ have to be defined by people themselves in their local contexts.” (ibid p.21)

Brooks (2010) also considered how GPGs had been defined in CGIAR. While its internal literature had examined how to operationalise the concept of GPGs, Brooks questioned whether CGIAR’s outputs were GPGs at all. Brooks asked whether the GPG concept has been used to justify CGIAR’s role in a changing IAR environment, as it positioned itself as an organisation with the unique ability to deliver GPGs in order to assert its relevance and gain funding.

Brooks used rice biofortification as “...a lens through which to question the idea of ‘global science’ and the notion that it can generate generic research outputs as international public goods.” (Brooks, 2010, p.3)

She examined the case of rice biofortification to explore the application of CGIAR’s GPG principles in their programmes. She argued that conceptualisations of GPGs within CGIAR have been predicated on assumptions of scale-neutrality of research outputs, as exemplified by the rice biofortification programme – and CGIAR’s crop development programmes more generally. She considered that this conceptualisation had remained constant throughout CGIAR’s various reforms and restructurings and had dominated their research and programme priorities. However, she did not examine why the conceptualisation had remained unchanged.

Brooks asked how, within this framing, it might be possible to

“...create and protect spaces for a ‘public goods’ science which engages with social, cultural and agroecological diversity.” (ibid p.77)

She argued that, in order to explore that question, there was a need for an “...examination of the role and responsibility of the CGIAR vis-à-vis science for the public good”. (ibid)

This thesis seeks to undertake that examination.

2.7 Shifting regulatory frameworks

Governance frameworks affecting PGR conservation, research and plant breeding, have developed from the 1960s onwards. Treaties, Conventions and regulatory frameworks affecting PGR and IP, traditional knowledge (TK) and access and benefit sharing (ABS) overlap and are sometimes contradictory (Tansey and Rajotte, 2008; Bass, 2015).

Raustiala and Victor (2004) examined how different international frameworks governing aspects of PGR management interacted with each other, and considered the concept of a 'regime complex' for PGR management. They described the changes in rules on managing PGR in the 20th century:

"Rather than a single, discrete regime governing PGR, the relevant rules are found in at least five clusters of international legal agreements—what we call *elemental regimes*—as well as in national rules within key states.... These elemental regimes overlap in scope, subject, and time; events in one affect those in others." (Raustiala and Victor, 2004, p.279)

They identified these regimes – international institutions with a distinct set of rules and actors – as UPOV, FAO, CGIAR, WTO and CBD. Each separately addressed "...some important, but partial, aspect of the PGR issue." (ibid p.283). They argued that laws are not consistent across regimes and it is often not clear how rules made in one arena should be applied in another. This leads to inconsistencies and contradictions across rules governing PGR use and management. As a result,

"Negotiators often attempt to avoid glaring inconsistencies by adopting broad rules that allow for multiple interpretations." (ibid, p.277)

Further (often lengthy) negotiations are then needed to reach agreement on specific rules.

The authors presented some hypotheses about how regime complexes operate:

- That each individual regime will develop according to pre-existing interests of those negotiating (i.e. path dependence)
- That there will be forum shifting i.e. people will take negotiations to the forum where they think they are most likely to get their way
- That actors will focus on smoothing over inconsistencies i.e. focusing on how regimes fit together, rather than the "core rules" in each regime
- That inconsistencies are subsequently dealt with through "implementation and interpretation" (ibid p.280).

Feindt (2013) similarly argued that PGR governance takes place in overlapping regimes. He observed conflicting interests at play in different fora, and argued that alternative narratives about PGR governance could be identified. He labelled these narratives:

- Innovation, in which PGR is treated as a private good. This is reinforced through UPOV, TRIPS, CBD and national patent laws
- Community: PGR as a club good, reinforced through the Seed Treaty and traditional seed systems

- Life: PGR as a global common good, reinforced through exemptions to patentability of various life forms.

He argued that these are partial narratives because each forum deals with only one aspect of PGR governance (echoing Raustiala and Victor). He theorised that the narratives are reproduced through a multiplicity of technical committees and sub-bodies in the governance frameworks, where policies are made regarding ever smaller elements of the whole picture.

Feindt concluded that the partial nature of the narratives gives seeming legitimacy to the operations of the various sub-committees, but at the same time ostensibly depoliticises their work because they do not have to engage with competing narratives. He thus presented an alternative interpretation of Raustiala and Victor's observation that negotiators focus on the detail of how regimes fit together, rather than on core rules.

Helfer (2004) examined the interaction of international regimes from an international law perspective. He observed that IP law-making had moved into new international regimes, such as those for PGR and public health. He argued that such regime shifting was a strategy used by stakeholders unhappy with the outcomes of negotiations in the traditional fora i.e. WTO and WIPO. This strategy was mainly used by developing country governments. However, the strategy has been countered by actors such as USA moving IP negotiations into bilateral arenas. In this way, regime shifting can be seen to be a demonstration of power in the global political economy.

Raustiala and Victor (2004, p.297) argued that the power dynamics between different actors within regimes, and the relative strength of the regimes affected policy outcomes in regime complexes. Even when there were pre-existing norms in a regime, they could be challenged by norms in another regime. For instance, actors fighting against the introduction of property rights were not as powerful as those acting in the WTO to develop TRIPS. Therefore, Ziegler (2004, p.14) claimed a "...marked paradigm shift...from a system seeking to foster food security on the basis of the free exchange of knowledge to a system seeking to achieve the same goal on the basis of private appropriation of knowledge."

The international agreements, conventions, treaties and institutional arrangements dealing with aspects of PGR management, use and exchange are listed below, followed by brief explanations of their relevance and implications.

2.7.1 Treaty timelines

Table 2.1 Treaty timelines

Date	Treaty / Convention / Event
1961	International Convention for the Protection of New Varieties of Plants agreed and UPOV established
1967	World Intellectual Property Organisation Convention agreed and WIPO established. (Convention comes into force 1970)
1972	UPOV Convention revised
1978	UPOV Convention revised again (UPOV, 2011)
1983	<p>FAO Conference adopts a Voluntary International Undertaking on Plant Genetic Resources. (FAO, 2020)</p> <p>Commission on Genetic Resources for Food and Agriculture (GRFA) established under the auspices of the FAO.</p>
1989	FAO Conference adopts an Agreed Interpretation of the International Undertaking, on the relationship between the Undertaking and UPOV and on Plant Breeders' Rights (PBR). This stated that PBR are "not inconsistent with" the International Undertaking. Conference also adopted a resolution on Farmers' Rights, aiming to strike a balance between breeders and farmers – here identified as formal and informal innovators.
1991	UPOV Convention revised again, this time to incorporate exclusions e.g. subsistence farmers (UPOV, 1991)
1993	<p>Convention on Biological Diversity (CBD) comes into force.</p> <p>Negotiations started on the revision of the FAO International Undertaking in order to fit with CBD, and to deal with issues not covered by CBD such as farmers' rights and access to <i>ex situ</i> collections.</p>
1994	Agreement with 12 CGIAR Centres (and later other bodies) to place their collections under the auspices of FAO as an interim measure while the IU is renegotiated. Under these agreements, the Centres agreed "to hold designated germplasm "in trust for

	the benefit of the international community", and "not to claim ownership, or seek intellectual property rights over the designated germplasm and related information". (FAO, 2020)
1994	TRIPS (Trade-related aspects of intellectual property rights) agreed under WTO Uruguay Round
1995	FAO Commission mandate extended at the FAO Conference to “cover all components of biodiversity of relevance to food and agriculture.” (FAO, 2020)
2000	WIPO Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore (IGC) established
2001	FAO Conference adopts the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). It “...recognises Farmers’ Rights and establishes a Multilateral System to facilitate access to plant genetic resources for food and agriculture, and to share the benefits derived from their use in a fair and equitable way.” (FAO, 2020)
2002	Bonn voluntary guidelines on access and benefit sharing agreed under the CBD
2003	Cartegena Protocol of the CBD, on Biosafety, comes into force
2004	ITPGRFA comes into force, setting standards for the management of PGR held by genebanks
2004	FAO and Bioversity International establish Global Crop Diversity Trust (GCDT)
2006	ITPGRFA agreements replace the agreements made between CGIAR and FAO in 1994 GCDT incorporated as part of the fundraising strategy for the ITPGRFA
2010	Nagoya Protocol to the CBD on access and benefit sharing adopted
2011	Second Global Action Plan adopted by FAO Council
2012	GCDT – now named Crop Trust – starts 5 year Genebank Research Programme with CGIAR
2014	Nagoya Protocol to the CBD on access and benefit sharing comes into force
2015	DivSeek – an “initiative that aims to facilitate the generation, integration, and sharing of data and information related to plant genetic resources (PGR)” (DivSeek, 2020) –

	established, with support from GCDT and the ITPGRFA Governing Body. DivSeek shares with its members (mainly research institutions including CGIAR centres) gene sequence data for PGR held in genebanks, including (but not limited to) Annex 1 crops.
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2.7.2 Brief overview of treaties and conventions:

UPOV (International Union for the Protection of New Varieties of Plants), 1961, revised 1991:

UPOV's mission is "...to provide and promote an effective system of plant variety protection, with the aim of encouraging the development of new varieties of plants..." (UPOV, 2011)

It established intellectual property rights for plant breeders, defining a form of plant variety protection (PVP) called plant breeders' rights (PBR). It was "...created and shaped by plant breeders for plant breeders..." (Dutfield, 2008, p.34).

Plant varieties that can be protected under UPOV must be "(i) new, (ii) distinct, (iii) uniform, (iv) stable..." (UPOV, 2017)

The convention allows for some exceptions to PBR. These are the use of varieties "...privately and for non-commercial purposes"; to use varieties for research; and to use them to breed other varieties (UPOV, 2017). There is an additional optional exception which permits "...farmers to use for propagating purposes, on their own holdings, the product of the harvest which they have obtained by planting, on their own holdings, the protected variety..." (Article 15, UPOV, 1991).

WIPO (World Intellectual Property Organisation) Convention, 1970, amended 1979:

WIPO's purpose is to "...promote the protection of intellectual property throughout the world" (Article 3, WIPO, 1979). It provides technical assistance to its member states, to relevant UN bodies and to the WTO on the implementation of IP regimes at international level (Oliva, 2008).

WIPO committees include the Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore (IGC). This Committee has worked to increase understanding of the inter-relationship between genetic resources and TK; and to examine the impact of different forms of IP on both. Negotiations on instruments to protect TK and genetic resources are ongoing (WIPO, 2020).

FAO Commission on GRFA, 1983:

Established in 1983 to examine issues relating to PGR, in 1995 its mandate was extended at the FAO Conference to include all genetic resources. The Commission has produced global assessments of the state of genetic resources for food and agriculture, separately covering plant, animal and forest genetic resources. It has also developed Global Plans of Action for each of these sectors.

FAO International Undertaking on PGR, 1983:

The 1983 International Undertaking was the first international process addressing PGR for food and agriculture.

It defined PGR as “...a heritage of mankind...” vital for future plant breeding for agriculture, which should be “...available without restriction” (FAO, 1983b). It included agreement on the development of an international network of genebanks, under the auspices of the FAO, which would hold PGR “...for the benefit of the international community and on the principle of unrestricted exchange...” (Article 7). This would be supported by a “global information system”, and an “intergovernmental body” which became the Commission on GRFA.

The IU was a voluntary agreement, and eight countries⁶ registered objections, on the grounds that it did not recognise PBRs (Halewood and Nnadozie, 2008). As a result, in 1989, two resolutions were adopted which “...recognized the rights of both donors of technologies and donors of germplasm to be compensated for their contributions through the simultaneous recognition of plant breeders' and farmers' rights.” (FAO, 1989, para. 105). The first allowed states to “...impose only such minimum restriction on the free exchange of materials...as are necessary for it to conform to its national and international obligations” (FAO, 1989). The second defined Farmers’ Rights as “...rights arising from the past, present and future contributions of farmers in conserving, improving, and making available plant genetic resources...” (FAO, 1989).

In 1991, a further resolution was annexed to the IU, which aimed to address issues of national ownership of PGR. It stated that:

“...the concept of mankind's heritage, as applied in the International Undertaking on Plant Genetic Resources, is subject to the sovereignty of the states over their plant genetic resources” (FAO, 1991).

In 1994, CGIAR agreed to place the *ex situ* PGR collections held by Centres under the auspices of the FAO. However, the 1994 agreements with FAO were between each individual CGIAR

⁶ Denmark, Finland, France, New Zealand, Norway, Sweden, UK and USA (Bragdon et al., 2008)

Centre and FAO, rather than at a System level and each Centre was able to choose what PGR to include in the agreement. As there was overlap between collections held by different Centres, this led to a lack of clarity over which crops came under the auspices of the CGIAR-FAO agreements. In addition, each Centre could decide whether or not to include their own breeding lines in the agreement. This meant that the products of CGIAR research were not necessarily subject to the FAO agreements. These issues are explored in Chapter Five.

CBD (Convention on Biological Diversity), 1993:

The CBD has three objectives:

- conservation of biodiversity
- sustainable use of natural resources
- "...the fair and equitable sharing of the benefits arising out of the utilization of genetic resources..." (UN, 1992).

It contains 42 articles, covering conservation, sustainable use and information, access, funding and governance issues. It is a 'framework convention' which means that additional protocols can be added as agreement is reached on outstanding issues (Bragdon et al., 2008).

It redefined key concepts which had been used up to that point in international processes governing PGR use. In particular, it replaced the concept of PGR as 'common heritage of mankind' with nation states' "...sovereign rights over their own biological resources..." (UN, 1992), giving states responsibility for conservation and sustainable use. It requires signatories to implement the Convention at national level, developing or adapting national legislation as necessary.

As part of this, nations can decide on access to the genetic resources within their jurisdiction (UN, 1992, para. 15). Access should be on "mutually agreed terms" (between the relevant authority in the country where the PGR are located and the party seeking access to them) and should be "subject to prior informed consent" (ibid) of the relevant national authority.

Access issues were closely linked with benefit sharing, covered in paragraph 7 of Article 15. This required measures to ensure "...sharing in a fair and equitable way the results of research and development and the benefits arising from the commercial and other utilization of genetic resources with the Contracting Party providing such resources." (ibid). The rationale was that benefit sharing would provide an incentive to countries to conserve their biodiversity, as they could anticipate economic returns from it.

The CBD also formally recognises the value of Traditional Knowledge (TK) associated with genetic resources and obliges signatories to “...respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities...” (Article 8(j)). An Ad-Hoc Working Group on Article 8(j) was established in 1998, and continues to meet.

The CBD identified a number of ‘outstanding issues’ about which decisions still had to be made. These included the treatment of *ex situ* collections collected prior to the coming into force of the CBD, and for which information on country of origin might not be available. A further outstanding issue was that of Farmers’ Rights. Both these were to be dealt with through the FAO process of renegotiating the Undertaking.

Cartagena Protocol, 2003:

The Cartagena Protocol on Biosafety established mechanisms to manage the movement of transgenic crops, in order to minimise risk of inadvertent contamination of the environment from the products of biotechnology. The negotiation of the Protocol was controversial, with major exporters of agricultural commodities unwilling to agree to strict controls on the movement of GMOs.

Nagoya Protocol, 2014:

Despite benefit-sharing being one of the three objectives of the CBD, implementation mechanisms were not agreed until the adoption of the Nagoya Protocol on Access and Benefit Sharing (CBD, 2015).

The Nagoya Protocol covers both genetic resources and TK covered by the CBD. It provides mechanisms to support its implementation, including funding through the Global Environment Facility, information sharing through the ABS Clearing House and capacity building.

TRIPS (Agreement on Trade-Related Aspects of Intellectual Property Rights), 1994:

The TRIPS Agreement of the WTO was agreed as part of the Uruguay Round of the WTO and brought IP rights into international trade agreements. Agriculture was also incorporated into WTO agreements during the Uruguay Round, and therefore IP issues were extended to the agriculture sector for the first time. Although Article 27.3(b) allows for exclusions from patenting for “...plants and animals other than micro-organisms...” (WTO, 2020), it also states that members have to put in place some form of PVP. Countries can choose how to do this, but WTO favours the UPOV convention (Dutfield, 2008).

Member states have different views on whether or not TRIPS is compatible with the CBD. Of particular concern is that TRIPS does not require compliance with CBD requirements (of prior

informed consent and benefit-sharing) before granting patents. A number of different approaches have been put forward for addressing the problem, including refusal of patent applications where there is no proof of compliance with the CBD; integration of information about genetic resources and Traditional Knowledge (TK) into the patent system; and national-level systems for challenging patents (Roffe, 2008). However, little progress has been made on reaching agreement (WTO, 2011). Instead, discussions on the relationship between IP and TK has been moved to WIPO.

ITPGRFA (International Treaty on Plant Genetic Resources for Food and Agriculture) – known as the Seed Treaty, 2004:

The objectives of the Seed Treaty “...are the conservation and sustainable use of plant genetic resources for food and agriculture and the fair and equitable sharing of the benefits arising out of their use, in harmony with the Convention on Biological Diversity, for sustainable agriculture and food security.” (FAO, 2009b)

It superseded the International Undertaking, which had to be renegotiated to ensure compatibility with the CBD.

The Seed Treaty establishes a multilateral system (MLS) for sharing PGR of 64 crops (listed in Annex 1 of the Treaty) for conservation, breeding and research use for food and agriculture (Article 12.3 (a)). It expressly recognises Farmers’ Rights at national level (in Article 9) and aims to establish a mechanism for sharing the benefits of commercialisation of products developed from PGR accessed through the MLS, at the same time as recognising that countries retain the sovereign right to set their own laws on PGR access (Article 10.1). Article 11.1 states that the crops included in the MLS were chosen “...according to criteria of food security and interdependence”. However, the politics of treaty negotiation meant that a number of crops that are globally traded are not included (e.g. soy)⁷.

Halewood and Nnadozie (2008, p.115) argued that the Treaty differs from other regulatory instruments relating to PGR “...because it concentrates on defining and maintaining a commons, instead of means by which to fence portions of it off.”

Article 15 concerns the *ex situ* collections held primarily by CGIAR Centres, and the Treaty superseded previous agreements between FAO and the CGIAR Centres on the management of their collections. It calls for CGIAR (and others) to put their relevant PGR (i.e. the 64 crops)

⁷ See Visser (2013) for a detailed description of the negotiations over which crops would be included in Annex 1

under the auspices of the Treaty. Article 15.1(c) requires the Centres to accept the authority of the Treaty Governing Body on policy issues relating to their collections.

The implications of the Seed Treaty for CGIAR's management of PGR are discussed in Chapter Six.

As with other Treaties, once agreement had been reached, further negotiation on modes of implementation were needed because:

- Operation of the MLS required agreement on the legal framework under which PGR could be transferred. But this was not agreed till 2006, so the MLS was not operational till then.
- A number of Articles include deliberately ambiguous wording because agreement could not be reached. For instance, Article 12.3 (d) on the taking out of patents is unclear as to whether this is prohibited completely or only if such a patent would limit access to PGR under the terms of the MLS (Halewood and Nnadozie, 2008).
- There is no enforcement mechanism to ensure contributions to the benefit-sharing fund. As a result, the Treaty Governing Body has reported, with concern, the low level of funding into this mechanism (FAO, 2015).

GCDT (Global Crop Diversity Trust), 2004:

The Global Crop Diversity Trust – now called the Crop Trust – was established as a funding mechanism for the ITPGRFA. It established an endowment fund which funds the maintenance of *ex situ* PGR collections, giving priority to 25 of the 64 crops in Annex 1 of the ITPGRFA. It also maintains the Svalbard Global Seed Vault. Its role in relation to CGIAR genebanks is discussed in Chapter Seven.

DivSeek, 2015

The DivSeek (Diversity Seek) initiative aims to develop a system for the storage, sharing and analysis of digital information about PGR (FAO, 2017). The project has been highly controversial, with NGOs and farmers' organisations arguing that it undermines the principles of the ITPGRFA by enabling researchers to access genetic information without contributing to the ABS fund. Via Campesina (IPC, 2017) and others argue that researchers can access genetic information without having to access physical seeds, and therefore they do not have to comply with the terms of the MLS.

2.7.3 Implications of regime complexes for public IAR

Section 2.7.2 has outlined multiple regulatory regimes affecting food system functioning. Those regimes are inter-linked but also in partial conflict, because different values and interests inform their policy processes. They have also created a complex of institutions with overlapping mandates. This model of conflicting regimes echoes the conflict within the third food regime described by McMichael, in which corporate approaches to food, which see only its economic value, are challenged by social movements and others who consider food to hold multiple values (social, cultural, political, nutritional, environmental) and food production to serve multiple functions.

The existence of such interlinking regimes, each governing a different element of the overall global agri-food system, creates a complex arena of conflicting policy fora through which policy makers and others have to navigate. The relative power of different regimes (and actors within them) and contestation over the location of policy making authority across fora is a key feature of the complex governance of agri-food policy.

A body such as CGIAR, whose work spans multiple governance regimes (those relating to food security, management of PGR, intellectual property, environmental concerns) has had to try to navigate a path between diverse regulatory frameworks, and through competing political interests of its stakeholders – governments, donors, civil society and the private sector. CGIAR was not just affected by changes in international regulatory frameworks, but was also an active participant in their development, particularly the Seed Treaty. Those processes are discussed in detail in Chapters Five, Six and Seven.

Inconsistencies across the regime complex created practical difficulties for CGIAR. For instance, Blakeney (2004) pointed out that TRIPS article 27.3(b) (which states that plant varieties must be protected by IP (or another system) does not actually define ‘plant variety’. Therefore, it is not agreed what has to be protected under IP rules.

Similarly, Shashikant and Meienberg argued that UPOV and ITPGRFA are inconsistent regarding Farmers’ Rights (Shashikant and Meienberg, 2015). UPOV 91 puts limitations on farmers’ rights to sell seeds, or the products of those seeds. It also precludes any seed swapping or exchange, which is a key element in biodiversity conservation and development, and an important practice for farmer innovation. Although UPOV permits subsistence farmers to exchange ‘propagating materials’ if national legislation allows, UPOV has rejected national legislation enabling such exchanges. The authors highlighted several other areas of conflict between the two frameworks, and concluded that UPOV does not support the range of farmers’ rights

allowed for under the ITPGRFA. In this context, it is difficult for policy makers in IAR to know how to uphold relevant regulatory frameworks.

More fundamentally for CGIAR as an institution, the new international frameworks required clarity over the legal status of PGR held in CGIAR genebanks. The changing understandings of the value of PGR, specifically the shift from 'common heritage' to national sovereignty, meant that the legal status of collections held by the Centres had to be resolved during negotiations of the Seed Treaty (Moore and Frison, 2011).

CGIAR has played a key role in addressing the inconsistencies between regimes, through its management of PGR held in the public sphere. Raustiala and Victor (2004) described the operations of CGIAR genebanks as an example of how actors attempted to establish rules through implementation, rather than through negotiation and agreement. For instance, they described the lack of clarity over the different treatment of 'raw' and 'worked' PGR, noting that the CBD enabled states to claim sovereign ownership only over raw PGR (i.e. PGR that has not been developed through any crop breeding process).

However, CGIAR collections contained both 'raw' and 'worked' PGR, and material 'under development' by CGIAR scientists. CGIAR had to work out how to implement new rules on access to different forms of PGR created by the CBD. But separating out 'raw' and 'worked' PGR proved impractical. It was also the crux of the argument about Farmers' Rights, because seeds considered 'raw' by scientists have actually been 'worked' by generations of farmers.

CGIAR and other stakeholders have tried to find practical solutions to inconsistencies between agreements, or interpretations of legal terms to enable consistency. However, inconsistencies have remained – including how to interpret and implement Farmers' Rights (see Box 6.3).

Alongside addressing regulatory changes, CGIAR had to reconsider the role of public agricultural research as boundaries between public and private research shifted. This was particularly the case for research on, and management of, PGR (Blakeney, 2011).

Thornström (2005, p.2) was concerned that changing regulatory regimes, and the need for actors to operate within multiple, overlapping regimes, reduced the space for, and changed definitions of, public goods. In particular, he argued that the move from the principle of common heritage to one of regulated access has led to a process of "...enclosing of the biological and genetic commons..." with PGR moving "...from being a free public good to private, corporate or state property." He argued that the regime complex for PGR:

“...creates legal uncertainties that greatly hamper international exchange of scientific information and biological material. Most threatened is the concept of international public goods/IPG, presently taken for granted, not least in the public sector.” (ibid p.4)

It should be noted that Thornström was a member of CGIAR’s Genetic Resources Policy Committee at this time. CGIAR’s internal debates about PGR as public goods are explored in depth in Chapters Five, Six and Seven.

CGIAR’s responsibility in relation to PGRs changed over time in response to the development of the PGR regime complex described above. In the 1980s, CGIAR Centres had a relatively straightforward role in the collection and conservation of PGR. But in the 1990s, they had to respond to changing international governance regimes and overlapping legal frameworks.

They did this by developing their own policies, databases and systems of managing PGRs. They similarly developed policies on IP, both for CGIAR research and to enable CGIAR to access proprietary research and tools held by others. But this led to controversies both between Centres, which took different approaches, and between CGIAR and civil society organisations who were concerned about the lack of transparency over decisions about the use of IP, and about how PGRs were accessed, by whom and for what.

CGIAR’s internal debates about IP and PGR policy and management are explored in depth in Chapters Five, Six and Seven.

Commentators in the early 2000s highlighted the need for CGIAR to develop a clear approach to IP management across the Centres, if it was to avoid controversies and uphold its public goods mandate. Egelyng (2005) argued that CGIAR did not have the capacity to analyse and respond to potential controversies over PGR use, and did not have a clear development goal for its IP policy. Binenbaum (2004) similarly argued that CGIAR should strengthen its capacity to manage IP rights. However, he argued it should do so to enable it to build partnerships with private actors who were increasingly engaged in agricultural research.

Conversely, civil society activists were concerned about CGIAR’s increased engagement with private actors. For example, ETC Group (2012) argued that funders’ policies aimed at bringing smallholders into markets, along with increased direct engagement in research, development and extension services by agribusinesses and processing companies, were reducing the operating space for public IAR, and shaping the type of IAR conducted.

The authors argued that CGIAR partnerships with the private sector were unequal, with agribusinesses seeing CGIAR as a ready-made research set-up with bases across the global South and publicly-funded scientists who can do “...the most speculative and least profitable research” (ETC Group, 2012, p.4).

ETC Group expressed serious concerns about conflicts of interest, and the direction of change for public IAR research. This thesis aims to interrogate those issues.

2.8 Conclusion

The focus of the thesis is on CGIAR's policy approaches to its use, control and management of crop biodiversity held in its genebanks. This chapter has reviewed contributions to the literature addressing issues relating to that concern. It has provided an overview of some relevant literature examining the changing nature of agricultural research in the context of contestations over alternative framings of agricultural development. It has highlighted debates between agricultural development models supporting globalisation processes, and rights-based approaches centred on the complexity of smallholder livelihoods. It has described conceptualisations of globally-applicable science outputs and their relevance to addressing food security issues. It has considered factors affecting the changing shape of IAR. These have included increased private sector engagement in crop development, the impact of new technologies and new regulatory regimes, the expansion of IP regimes into the agricultural research sector and the dominance of market-led approaches to agricultural development.

The chapter has examined controversies about the impact of these factors on PGR governance. It has considered how the value of PGR has been and is framed in different approaches, including the relationship between information in different forms and traditional knowledge and rights. The chapter has also briefly examined literature exploring the interface between CGIAR's role in these debates, particularly its mandate to provide public goods and its approach to PGR governance.

The literature outlined above has also considered several aspects of debates on PGR governance under changing regulatory regimes. Authors have examined legal frameworks; implications of the expansion of IP into the agriculture domain; the relationship between IP and public goods; and PGR as a public good. But there is little that has brought them all together. This thesis seeks to do so.

Sumberg et al. (2013) called for further research to

“...focus on the role of framing and narrative in contextualising, justifying and prioritising some research topics, areas and approach over others. Closely related to this is concern with the processes and politics of research agenda setting.” (Sumberg et al., 2013, p.77).

This, they suggested, required an examination of relationships between actors involved in IAR and the politics and power dynamics influencing decision-making about research priorities. In

bringing together the literatures discussed above, this thesis seeks to engage with those concerns.

The next chapter introduces the concept of 'global public goods', and examines literature that explores diverse understandings of the term. It considers the relevance of these different meanings to the thesis' exploration of CGIAR's approach to managing PGR as a public good.

3. Global Public Goods: theories and interpretations

3.1. Introduction

The previous chapter has outlined literatures relating to the thesis topic. It has provided a summary of debates about different models of agricultural development, and the role of international agricultural research (IAR) in alternative models. It has provided an overview of global regulatory frameworks governing the use of plant genetic resources (PGR) and outlined controversies about the impact of those frameworks. It has examined those, and other factors, affecting policy decisions in IAR, and introduced the challenges facing CGIAR within changing PGR governance frameworks.

CGIAR claims that, as a provider of public IAR, its purpose is to produce global public goods (GPGs) through the provision of research outputs including new knowledge and technologies. But the concept of GPGs is complex, and multifaceted, and definitions and understandings are contested.

This chapter reviews several theoretical approaches to the concept of GPGs. It describes a diversity of definitions adopted by different actors, and how these have been interpreted for practical application across a range of contexts. The chapter also discusses the relevance of the debate about GPGs to policy debates relating to IAR. By presenting an examination of how the concept of GPGs has been interpreted and applied, the chapter provides a background to debates within CGIAR about how it should enact its GPG role.

3.2. Global Public Goods Theory: defining GPGs

Samuelson (1954) advanced an economic theory of public goods, defining them as non-rivalrous (i.e. use by one person does not diminish the availability of the good to others) and non-excludable (i.e. its benefits are available to all). The concept of *global* public goods arose in the late 1990s in response to, and in the context of, globalisation. Speth (1999, p.xii) noted that globalisation meant that key issues of public policy “...such as financial stability, human security or the reduction of environmental pollution...” were no longer confined to national borders, and had impacts at the global level. As a result, a “theory of global public goods” was needed to inform “a new framework for international cooperation.” (Speth, 1999, p.xiii)

Kaul et al. (1999c) first presented a seminal ‘theory of global public goods’ and attempted to define what GPGs are, or should be. They hypothesised that a variety of global crises were caused by the under-provision of GPGs. They considered that the GPG concept could be a useful tool for describing and analysing such crises, and helping to identify policy solutions.

Kaul et al. built on Samuelson's economic theory of pure public goods (Samuelson, 1954) and considered that most goods are impure to some extent i.e. partially rivalrous and excludable depending on conditions of production and consumption. The term 'public good' is used to describe both pure and impure goods. Drahos (2004) argued that the quality of excludability enables public goods to be provided through private mechanisms. Similarly, (Burnell, 2008) noted that a public good does not have to be provided by a public body; and it may be partly private, having only some public good attributes.

Kaul et al. (1999a, p.5) classified PGs further: non-rivalrous but excludable goods are 'club goods'; goods which are non-excludable but rivalrous are 'common pool goods'. They also described goods with an 'existence value' such as biodiversity, which cannot be consumed, but which have a value by virtue of existing; and merit goods, which have social value, such as art. They defined PGs in terms of the benefits from them that accrue to society in general rather than to the single individual who has paid for that 'good'. "...[the] difference between the public and the private benefits is called an externality." (Kaul et al., 1999d, p.xx). Negative externalities arise when the producer does not bear all the costs, and externalities (benefits or costs) can be widely diffused.

Kaul et al. (1999a) described the economists' approach to externalities, which consider them to be positive or negative depending on their 'utility' to others, but were concerned that this approach did not take into account social priorities, which are a key element of policy making.

For example, the World Bank defines PGs as:

"...those goods and services essential for survival and should be available for people without charge." (World Bank, 2005)

By this definition, food, water, shelter, health, peace and other basic human rights would be considered as GPGs, and the international community would have a responsibility to ensure their provision. International commitments to provide GPGs arise out of societal norms and priorities. However, the World Bank goes on to argue that air is the only pure PG. Because other goods are impure, there is a lack of agreement amongst international policy makers over what counts as a GPG, who should provide them, and how.

Sagasti and Bezanson (2001) also argued that identifying and defining public goods are political judgements. The impure nature of most goods means that there are costs and benefits to different actors in different circumstances, which have to be balanced and negotiated. But because the benefits of public goods accrue in a dispersed way, few individuals are willing to pay for them. This means that they are either under-provided, or have to be provided through

public action, or both. The concept of collective action is consequently relevant (Kaul et al., 1999d). The International Task Force on GPGs (ITFG) similarly defined GPGs in terms of the actions needed to provide them. They argued that GPGs are goods that, because they are important internationally, are unlikely to be provided by one country or institution acting alone. The need for multilateral action to ensure provision of the goods therefore defines them as ‘global’⁸ (ITFG, 2006).

3.2.1. Publicness and globalness

Authors attempting to define and analyse GPGs have provided different conceptualisations of their key characteristics. One aspect of globalness derives from the provision of a good through multilateral action. However, globalness and publicness overlap because a further aspect of globalness is provision of a good to a wide public. Kaul et al. (1999a) considered that identifying what qualifies as a GPG can be done by asking who the beneficiaries are – who the public is – when talking in a global context.

Kaul et al. (2003a, p.23) further defined GPGs as “...goods with benefits that extend to all countries, people, and generations.” This incorporates notions of sustainability and inter-generational equity in the provision of, and access to, GPGs.

Drahos (2004, p.52) observed that anything other than a pure private good has some public element. Kaul et al. (2003b, p.6) similarly argued that publicness was a movable quality:

“...publicness and privateness often are not innate properties. Goods can be...shifted from one side of the public-private continuum to the other.”

Some analysts have argued that the public or private nature of goods is not an intrinsic characteristic, but a characteristic assigned to the good by society (Callon, 1994; Kaul and Mendoza, 2003). Thus, identifying GPGs, and choosing which to prioritise for action by the international community, are inherently political acts. Tansey (2004, p.663) stressed the role of values:

“There are enormous philosophical and ideological differences in how different groups see the public and private sphere.”

Kaul et al. (2003b, p.6) argued that ‘globalness’ was a “dimension of publicness”. Goods which had previously been provided at the national level were now of global relevance, and conversely, globalisation processes reduced the policy choices available at the national level. They suggested a ‘triangle of publicness’, by adding attention to the dimensions of “publicness

⁸ Dalrymple (2008) noted the use of ‘global’ and ‘international’ PG interchangeably in many policy documents, and suggested that the geographical scope of a PG depends on political boundaries rather than the nature of the good.

in decision making” and “publicness in the distribution of net benefits” to “publicness in consumption” (Kaul et al., 2003b, p.24) in order to address issues of equity and make visible the social and political element of decisions about what is a ‘global’ and ‘public’ good.

3.2.2. Different approaches to identifying and characterising GPGs

It is necessary for international actors to identify and define different kinds of GPGs in order to know what action to take to provide them, and at what scale (local, national, international). Kaul et al. (1999a, p.13) distinguished between global policy outcomes and intermediate GPGs. They defined intermediate GPGs as actions or policy frameworks needed to “...contribute towards the provision of final global public goods.”

For instance, intermediate GPGs include international agreements, which set the rules for collective action needed to provide the final GPG outcome, such as reductions in greenhouse gas emissions. Similarly, Drahos (2004) put forward the idea of primary public goods – ones which are necessary for the creation of other goods, both public and private.

Building on this, there is some consensus that international rules and institutions should be considered as GPGs. For instance, ITFG (2006) characterised not just the outcome of cooperation as a GPG, but the cooperation itself. However, Langford (2009) questioned whether international regimes such as international trade rules and associated institutions could be considered GPGs, when many people would argue that they have created negative outcomes, at least for some groups.

3.2.3. Knowledge as a ‘public good’

CGIAR claims that by creating new knowledge through its research, it is providing public goods. It (and others e.g. Stiglitz, 1999) considers ‘knowledge’ to be a pure public good. By extrapolation the outcomes of research, as a form of knowledge are intrinsically PGs. Proponents of this view point to the role of science in fuelling innovation and economic growth, describing social benefits beyond the financial benefits received by the producers of the innovation (Dalrymple, 2008).

However, in practical terms there are many reasons why knowledge may not be universally available and accessible. While there are almost inevitably spillovers and externalities from research and knowledge production, the public good outcome of research is socially constructed through policy, regulation and other barriers to access.

Drahos (2004, p.53) distinguished between “capability-independent” and “capability-dependent” goods i.e. goods which can be used by anyone, and goods which can only be used

by those with additional capabilities. For example, technical knowledge may be available to everyone, but not everyone will be able to use it, if they do not have the necessary technical skills or equipment.

Further barriers might include not only the form in which the knowledge is available, but the relevance of the knowledge to the context in which it might be used. By this understanding, if knowledge is to be considered a GPG, it must be not only created but also provided to the public and made accessible to those whose use of it will improve social welfare outcomes.

3.2.4. Equity in identification and provision of GPGs

As noted above, not all goods are equally accessible or relevant to all groups, and their provision may not equally benefit all groups. Kaul et al. (1999c) stressed the importance of fairness in designing mechanisms for GPG provision, and for the allocation of resources to provide them.

Rao et al. (1999, p.66) argued that:

“...equity and distributional criteria must be at the core of a global public goods framework for international cooperation.”

They argued that equity is needed to create the conditions, such as cooperation and trust, under which GPGs will be provided, and international cooperation will only come about if participants feel that costs and benefits will be fairly shared.

This is a relevant issue to consider in the context of international regulatory frameworks governing the benefits deriving from the use and control of PGR. Issues of access and benefit-sharing have remained at the centre of controversies over the implementation of the Seed Treaty.

Rao et al. (1999, p.66) argued that:

“...equity is needed not just to organize the supply of public goods but also to define the demand for public goods and answer the question: whose public good should be on the agenda?”

Returning to an economic understanding of PGs as goods which are under-supplied by the market raises questions of how demand for such goods can be expressed. Without equitable and participatory processes, the need for goods valued by marginalised communities is unlikely to be heard in commercial markets. Thus, equity in relation to GPGs goes beyond how they are provided and distributed to questions of how they are identified, who has a voice in deciding societal priorities and who benefits from the different possible mechanisms for their provision.

Kaul et al. (1999b, p.478) argued that GPG outcomes have to be agreed through political processes, and prioritised through decision-making processes which enable “all interested groups” to contribute.

This point was followed up by Sagasti and Bezanson (2001, p.ii) who attempted to build a conceptual framework taking into account “...values, preferences, interests, asymmetrical knowledge and power relations in defining global public goods and in arranging for their provision.”

Sagasti and Bezanson (2001) argued that a GPG delivery system which does not address these asymmetries will fail to deliver a GPG. In other words it will not deliver a good which is equally available and accessible to all. Kaul et al. (1999d, p.xxix) argued further that without wide participation in the priority setting processes where decisions are made about what sort of goods need to be public, “...the publicness of public goods will stay a potentiality, not a reality.”

In this understanding, the publicness of a good is a function not just of its availability and accessibility but also of its value to all.

For instance, Maskus and Reichman (2004, p.27) suggested that some processes of setting international standards did not appear to be in the interests of developing countries. They noted that developing countries “...play virtually no role in norm formation” and suggested that processes to harmonise international regulations often did not include mechanisms for taking into account, much less protecting, public goods concerns.

In relation to agricultural research, the IAASTD report raised questions about the value of agricultural knowledge, science and technology (AKST) to different groups of people:

“Some gains have been made in the reduction of poverty, but the contribution of AKST to increasing agricultural production and agriculture based incomes has been very different in different regions, agroecologies and for different groups of people.” (IAASTD, 2009b, p.194)

If the publicness of a GPG is based on how widely the benefits from its provision accrue – how many publics are served – then AKST that produces benefits for only some sections of the public cannot be classified as a GPG. When asymmetries in power make it impossible for all publics to express their values, preferences and interests, then policy makers and others choosing which goods to supply are unlikely to choose those most needed by marginalised groups, and may even choose to supply goods which are detrimental to their interests. Therefore, participatory decision-making is a vital element of both the publicness and the ‘goodness’ of GPGs.

3.2.5. Normativity in GPG theory

The theories of GPGs so far reviewed build on economic theories and understand the term 'public goods' in a specific economic sense. While Kaul et al.'s three dimensions of publicness extend the conceptualisation of the term, it nonetheless incorporates the notion of goods having an economic value. This leads to a blurring of understanding between the economic conception of 'good' as a commodity, a thing that can be sold, and 'good' as a moral imperative, such as eradication of poverty and hunger.

Sagasti and Bezanson (2001) noted these definitional difficulties, as did Langford (2009), who argued that GPG discourses should attempt to bring the two meanings together, by defining externalities in terms of their social benefits. The analytical framework developed here aims to address that concern.

By taking an economic conceptualisation of 'goods' as items of economic value, and public goods as those items whose economic value cannot be appropriated (or can be appropriated by all), the wider normative concept of 'public goods' as things that are of social value may become lost. Broader values associated with objects that can be commodified are also subsumed. For food, its cultural, social and ethical 'values' become secondary to its 'value' in the economic sense.

In addition, when goods are seen purely in economic terms, there is a dichotomy between public goods like a healthy population and the means to achieve them, which are often privately owned. This leads to a blurring of the roles between public and private sectors in the provision of goods which should be available to all, but which have an appropriable element.

This is also true for food. Even if cultivated food is always considered to be a private good, there are public attributes to ensuring its provision, such as public health. There are also some aspects of food production and consumption that are often considered public goods, such as environmental sustainability. In addition, inputs to food production (seeds, soil, knowledge, water) are sometimes public goods and are sometimes privately owned (Vivero Pol, 2013). However, when food provision becomes increasingly market-based, and food's commodity value is prioritised over its other values, commercial interests may undermine policy actions for ensuring a healthy population or environmental sustainability (WHO, 2018). Just as the environmental externalities of industrialised food production methods are often not paid for by the producers, so the positive externalities of good quality food cannot be captured by them. Both forms of externality are of value and/or cost to the state and to the public good.

Kaul et al.'s GPGs theory is both normative and policy oriented, being concerned with developing a framework for identifying 'goods' which provide social benefits and for designing mechanisms for their provision.

3.2.6. Global governance and policy mechanisms

If participation in decision-making is a key aspect of the publicness of GPGs, then it is relevant to ask how decisions on GPGs are made and what mechanisms are in place for global governance. Maskus and Reichman (2004, p.15) noted that without any global governance mechanisms, it was not clear where responsibility lay for ensuring "global welfare". Therefore, debates about global governance and the nature of 'global public goods' are intertwined.

An economic approach to public goods assumes that they are not provided by the market, and should therefore be provided by the state or international organisations. But extrapolating this understanding to the global level is problematic, because there is no global level government able to address market failure. Internationally, collective action is difficult because the problems to be addressed are international, but the unit of policy-making is often the nation state. There is therefore a mismatch between the levels at which provision is needed and at which policy is made. For GPGs, the need is identified, and regulated for, at a global / international level (e.g. through international treaties and conventions), while provision remains mainly the responsibility of nation-state level bodies.

This means that individual states have to take action, and make policy, to address issues with global impacts. Conversely, global processes affect the policy choices available to national governments.

Maskus and Reichman (2004, p.19) argued that development of international regulation is controlled by rich country governments often acting in the interests of international corporate bodies. They noted the lack of participation in law-making processes by "...representatives of the global public interest". Drahos (2004) similarly argued that elites are able to influence governments because they are a small socially cohesive group, while the general public are not able to organise, or be represented in negotiation processes, in the same way. This means that some interest groups have more access to policy negotiation processes than others, leading to some interests being over-represented. As a result, "...many of the public goods that are supplied by government line up with private rather than public interest" (Drahos, 2004, p.60). For instance, business lobbies were able to convince governments to make intellectual property (IP) regulation a high priority in international fora, even though it could be argued that such regulations are against the interests of most consumers, who make up the 'public'.

Debates about intellectual property rights (IPRs) have thus become intertwined with GPG issues. Maskus and Reichman (2004) argued that IP regimes may serve corporate interests more than those of the general public by placing formerly public knowledge in the private domain. They discussed the relationship between PGs and IPRs, noting that:

“Drawing the lines between knowledge goods accessible to all and those subject to private property rights has always be a delicate, controversial, and economically uncertain task...”
(Maskus and Reichman, 2004, p.16)

This task is even harder in an international context because countries have such varying economic interests. They also highlighted the way in which IP regulations affect policy choices in a wide range of sectors relevant to public welfare, such as health. They suggested that this has reduced the scope for policy making at a national level on key public issues.

Drahos (2004, p.47) also argued that regulatory mechanisms may affect GPG provision, distribution, access and consumption. He stressed that provision may not, in itself, ensure distribution and noted that “...restricting access to a public good is sometimes a deliberate choice” citing IPRs as an example. Kaul et al. (1999b) similarly suggested that policy could be designed in order to move a good along the public-private scale, thus changing incentives for its provision.

Dalrymple (2008, p.14) argued that, if scientific research “...is inherently a public good”, then private companies producing it may choose to use IPRs to keep at least some of it out of the public domain. Conversely public sector bodies might use IPRs to keep their research results in the public domain.

These debates are directly relevant to CGIAR and its stated role as a provider of GPGs in the form of scientific research and in its role as custodian of GPGs in the form of plant genetic resources that private companies may want to access.

3.2.7. Policy uses of GPG theory

Despite a broad consensus across academic literature about the need for a theory on GPGs, there have been few assessments of the usefulness of GPG theory in helping policy makers to decide about their provision. One exception is Sagasti and Bezanson (2001) who focused on financing GPG provision and delivery. The authors noted the lack of global institutions to make policy or finance the outcomes of decisions, which hindered the effective use of the concept in policy development.

“As a consequence, the transition from acknowledging a good, service or outcome as desirable to declaring that it is a ‘global public good’ is anything but straightforward or automatic. It is heavily influenced by public awareness and political decisions, and

requires collective action at the level of the international community (which includes not only national governments, but also private corporations and civil society organisations). It also begs the question of ‘desirable for whom?’ Declaring something to be a global public good has meaning only when embedded in a political process that assures its delivery.” (ibid p.v)

They developed a framework for an “...idealised ‘international public goods delivery system’” (ibid p.ii). This framework differentiated between the global production of a good, and the actions needed – usually at a local or national level – to ensure its delivery. These are defined as “...the *core component* of the delivery system, which should be taken care of by the international community” and “...the *complementary* activities that are the primary responsibility of national and local entities.” (ibid p.v)

They explained these concepts using the example of providing HIV/AIDS drugs to people across the world. They considered that the ‘core component’ consisted of producing, and making available, the necessary drugs; while the ‘complementary activities’ included financing the purchase and organising the distribution of drugs at national level. However, international bodies could decide to take responsibility for financing and organising the delivery of drugs to people who need them. This illustrates that the line between ‘core’ and ‘complementary’ elements of a GPG delivery system are politically determined (ibid p.ix).

However, Sagasti and Bezanson’s idealised system enabled identification of the roles required of different actors at different levels in order to ensure delivery of GPGs. It demonstrated the complex process of political decision-making, international regime formation, collective action, resource allocation and capacity development needed for GPG delivery.

The authors went on to describe a framework for considering financing mechanisms for GPGs. However, this framework did not incorporate any analysis of the value of goods to different stakeholders, how to identify goods that need financing, or where decision-making about funding takes place. Despite stating the importance of considering “...values, preferences, interests” (ibid p.ii) of different stakeholders in identifying GPGs, their framework for ascertaining how they should be financed did not provide space for this consideration. This gap means that the interests of funders, in ensuring provision of some public goods and not others, might not be considered. In the context of an increasingly privatised and corporatised food sector, where the vast majority of agricultural research is privately funded, this failure to examine interests within the political economy of the agri-food system is a limitation to their approach. Their framework does not include any analysis of the nature of the good being provided, and to whom it is of value i.e. the politics of whose needs are met through public

good provision and who decides which goods to provide. Instead it examines only the practical details of how a good should be provided, once agreement has been reached that it is needed.

Their analysis also considered the role of private finance in funding the provision of public goods, but focused only on private actors such as philanthropic bodies or academic institutions. Since their paper was written, this area has grown a great deal, along with new financing mechanisms through public-private partnerships, and through tax incentives to private sector actors, or regulatory support for business activity (e.g. World Bank 2017).

Similarly, the funding environment has shifted considerably since their paper was written, so that their analysis of where interests lie in funding provision of GPGs is no longer adequate. In particular, they considered that private sector actors would be expected to play only a minor role in financing core elements of the delivery system. It did not take into account private provision of public goods, which has become a key element of many donor policies in agricultural development more recently (see e.g. DFID, 2017).

Sagasti and Bezanson examined a series of case studies and concluded that GPG theory is a useful approach to analysing problems of GPG provision. They highlighted the value of the approach in defining GPGs, and the importance of a clear definition for “...deriving useful policy implications” (ibid p.xxii). However, it is hard to derive clear policy positions arising from a commitment to provide GPGs if their definition is not agreed between actors in policy processes.

3.3. Relevance of GPG theories to the thesis

Kaul et al.’s (1999c, 2003) GPG theory presented a normative understanding of GPGs. This provides a useful lens through which to examine what CGIAR policy makers understood when asserting that CGIAR is a provider of GPGs. A recognition of the multiple meanings attached to the concept of GPGs can illuminate questions about how different – and sometimes competing – understandings of the public good outcomes of CGIAR’s work have influenced its policy making and institutional development.

Kaul et al.’s GPG theory makes explicit the links between provision and publicness. This insight informs an examination of how mechanisms in CGIAR for the dissemination of research outputs affected their publicness, and where the boundary between public and private has been drawn at different times and in different parts of the CGIAR system. It raises broader questions about how outputs from publicly-funded research should be provided, by whom and to whom. This is particularly relevant to CGIAR’s stated role as custodian of GPGs in the form of plant genetic resources that private companies may want to access.

GPG theory also examines the publicness of consumption of goods and the publicness of decision-making about which goods should be provided. In particular, it highlights the political nature of such decisions, raising questions about how different stakeholders within CGIAR have been able to influence policy processes and their consequences, and the mechanisms for diverse perspectives to be heard. It prompts a consideration of who the beneficiaries are, how their needs and interests are identified and understood, how 'what the public values as a public good' is identified, and whether the types of research outputs CGIAR has produced can be deemed as GPGs.

It also raises questions about the types of knowledge used and disseminated by CGIAR. As discussed above, knowledge is not, in and of itself, a GPG unless it can be used by any publics freely, and is of benefit to multiple publics. In that context, factors affecting whether research outputs are GPGs include the relevance of knowledge to end-users, how it is created, by whom, and the form in which it is made available.

However, GPG theory is a general theory, applicable across sectors. It prompts those using the approach to ask questions about the politics of decision-making and the power balance between different actors in a policy process, but it does not provide tools to analyse the operation of power and politics in those decision-making processes. The tools used for such analysis in this thesis are presented in the next chapter.

3.4. Conclusion

This chapter has presented an exploration of theoretical approaches to understanding the concept of Global Public Goods, and practical applications of the concept in policy development. It has considered the relevance of debates about interpretations of GPGs to the topic of the thesis.

The next chapter presents the research design and methodology. It presents an analytical framework and describes how it has been applied to the empirical data presented in subsequent chapters. It provides an overview of the data collected, and how it was collected. It describes the case study approach taken to examine CGIAR's policy making processes in different time-periods. It presents the narrative analysis methodology used to identify different understandings of key concepts, particularly GPGs, and specifies the particular research questions the thesis seeks to address and answer.

4. Methodology and conceptual approach

4.1. Introduction

This chapter presents the thesis research design and methodology. It presents the conceptual framework used to examine the data, the methods of data collection, the analytical tools used to apply the conceptual framework to the data, and the research questions explored in the thesis. It presents the rationale for the choice of data collection and analysis methods; and it outlines how the approaches chosen for data collection and analysis provide the evidence needed to answer the research questions. It also considers some limitations to the research design and its implementation.

The research takes CGIAR's policy making on the management of Plant Genetic Resources (PGR) from 1990 to 2012 as its main case study and explores this through three sub-cases covering different time periods. The research is based on archival data, primarily from CGIAR's online archive, supplemented with interviews with key informants and documentary data from other sources where information was not available in the CGIAR archive. The approach to searching the archive is discussed below. Documents and interviews were analysed using a narrative analysis approach to identify and describe alternative perspectives on key issues held by different stakeholders. This analysis focused in particular on understandings of global public goods (GPG) concepts within the identified narratives. A policy process analysis framework was then used to examine how different understandings of GPGs arose, which stakeholders upheld them and how they influenced policy decisions.

4.2. Research design

The research design provided a structure for data collection and analysis directed towards finding answers to the research questions. This research takes a case study approach, with the evolution of CGIAR policy on the management of PGR from 1990 to 2012 as the main case. This is explored through sub-cases focussing on three specific time-periods.

The cases are examined primarily through archival research, supplemented with key informant interviews. PGR policy is examined using narrative methods to reveal a range of perspectives held by different stakeholders in the policy-making process, and the framing assumptions underlying their views. Policy process analysis is used to explore the interplay between these narratives and what that reveals about how power was enacted in CGIAR's policy-making.

The research is focused on policy-making in CGIAR at a global (rather than national or Centre) level. It examines the interactions of CGIAR stakeholders in policy-making and considers those

processes in the context of global governance frameworks for food and agriculture. It examines whether CGIAR policy-making processes can be considered as an illustration of wider policy dynamics and shifts in global agri-food system governance.

The research design applies conceptual tools for analysing policy processes (described in section 4.2.2.5) to the case study of the evolution of CGIAR policy on the management of PGR from 1990 to 2012. It uses a narrative analysis approach (described in section 4.2.2) to analyse the data by:

- Identifying narratives through examining archival and interview material in chronological order and observing how narratives developed, who presented which positions, how different perspectives were justified, contested and defended, and how they interacted with each other
- Checking the identified narratives against narratives presented in wider literatures on global agri-food system dynamics, and positioning different perspectives within those wider debates
- Considering how proponents of different narratives have framed CGIAR's role as a provider of GPGs and how these framings have shaped their policy positions.

This methodological approach aims to address questions of directionality in policy-making: whether – and if so how – a policy approach was maintained or reinforced and why other approaches were excluded. 'Directionality' is explained further in section 4.2.2.6.

4.2.1. Case study approach

Eisenhardt (1989, p.534) observed:

“The case study is a research strategy which focuses on understanding the dynamics present within single settings.”

Platt (2007) examined the various ways that 'case study method' has been described and implemented in different disciplines, and over time. Platt's survey identified when it is a particularly appropriate research strategy. This includes:

- When the research is situated
- Where there are multiple levels of interest in the area of research
- When context is relevant
- When the research involves the observation of patterns and structures.

Yin (1994, p.1) in his seminal text on case studies also described when a case study approach is a useful strategy:

“In general, case studies are the preferred strategy when "how" or "why" questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context.”

He further defined a case study as

“...an empirical inquiry that

- investigates a contemporary phenomenon within its real-life context, especially when
- the boundaries between phenomenon and context are not clearly evident” (ibid p.13 – italics in original)

A case study approach is therefore appropriate when the relationship between the case and its context is relevant to answering the research questions. It is a relevant approach for this research, which seeks to understand CGIAR policy-making on PGR in the wider context of shifting dynamics in the global agri-food system; and to analyse whether the dynamics of CGIAR policy-making might shed light on contestations in the wider context.

Case studies can be:

- Exploratory, descriptive or explanatory
- Single or multiple
- Holistic or embedded (i.e. a case embedded in a case, examining one aspect of a specific situation)
- Real-time or retrospective (Yin, 1994)

Yin (1994) stressed the need for a researcher to define the ‘unit of analysis’ for a case, and described the embedded case approach, in which sub-cases illustrate aspects of the main case.

“The same case study may involve more than one unit of analysis. This occurs when, within a single case, attention also is given to a subunit or subunits” (ibid p.41).

For this research, the main case is CGIAR policy-making on PGR with sub-cases of different time periods. The sub-cases were selected to focus on time periods when events external to CGIAR challenged dominant narratives within CGIAR about its role in the wider international agricultural research (IAR) field. In the light of those external pressures, CGIAR re-examined its policies on PGR management, its role as provider of public goods, and its relationships with other actors in the global agri-food system. An examination of policy formation during those time-periods can reveal the evolution of PGR policy – and the linked evolution of approaches to intellectual property (IP) and GPGs. The three sub-cases enable a study of how different actors positioned themselves, what alignments were made and which policy directions emerged. The sub-cases therefore serve to illuminate the main case, and enable a detailed examination of the interactions between holders of different policy perspectives. At the same

time, putting the sub-cases together enables the building of a long-term picture of policy development.

The sub-cases centre on 1) the coming into force of the Convention on Biological Diversity (CBD) (1993); 2) the period of negotiation on the Seed Treaty and its implementation (up to 2007); and 3) the period following the food price crisis of 2007-8 (up to 2012). Chapter Five also provides a contextual background to the debates examined in the sub-cases, by presenting a brief summary of the evolution of CGIAR's founding narratives from 1971 – 1990.

The organising principle for data analysis is the three time-periods, in relation to which the research questions will be examined. Examination of the sub-cases is directed towards asking the same questions across different periods to trace narratives across time to see where they have changed, stayed the same, or been contested, and with what outcome. In this way, the separate sub-cases contribute to an overall picture to reveal issues of directionality in public agricultural research policies (see section 4.2.2.6).

Platt (2007, pp.12–13) described the various interpretations of the boundaries of a 'case' in different disciplines:

“...some authors have distinguished between the case as substantive phenomenon, and as an analytical category used by the investigator. ...If the case is defined analytically, the problem of where its boundaries should be drawn, or how much of its context should be taken into account to understand and/or explain it satisfactorily, will in effect have been conceptually decided. If it is defined substantively, the question remains relevant. ...In practice the researcher must strike a balance between the need to limit work to a problem of viable scope and the need to take into account sufficient of the empirical realities.”

In this research, CGIAR policy making on PGR can be considered to be a unique case, defined substantively. The sub-cases of different time periods can be seen as analytical categories. However, the substantive case is still delineated by the practicalities of keeping the research within viable boundaries, and much is excluded. This is discussed further in section 4.5 below.

4.2.2. Narrative approach

4.2.2.1. Framing

Goffman (1974) described the concept of framing as a cognitive process by which people make sense of events and experiences. Leach et al. (2010a, p.4) stated:

“...the concept of framing refers to the particular contextual assumptions, methods, forms of interpretation and values that different groups might bring to a problem, shaping how it is bounded and understood. In many situations, such understandings take the form of diverse narratives or storylines about a given problem; how it has arisen, why it matters and what to do about it.”

Frames give shape, stability and structure to concepts, decisions and activities, bringing focus to what is inside the frame, to the exclusion of other considerations (Laws and Rein, 2003). In a policy context, frames enable interpretation of complex or controversial issues as simplified policy problems, thus suggesting a course of action to deal with the issue. However, different actors may view the issues from contrasting perspectives, framing the problem in different ways, and suggesting different actions in response.

For instance, Muzaka (2013) argued that intellectual property (IP) rules have been developed in line with a framing of IP as tool of international trade. However, groups affected by the impact of IP rules in other sectors have sought to frame IP as an issue of human rights, access to, for example, biodiversity or health services.

In any given situation, there may be one dominant frame, or multiple conflicting frames. Where there is contestation over how a problem is viewed, action to address the issue may be inhibited, as different stakeholders argue for conflicting responses. Such clashes between different frames arise from different normative perspectives.

Leach et al. (2010b, p.371) observed that:

“...all framing involves not just choices about which elements to highlight, but also subjective and value judgements.”

Paying attention to conflicting framings of an issue can reveal the ways in which policy making is a political process involving contestation and negotiation between different actors with different agendas, holding different values and approaching policy problems with different perspectives. By looking at how systems are framed, the role of actors and their political interactions can be examined (Leach et al., 2010a).

Laws and Rein (2003) argued that the framing of a problem and actions to address it are intertwined. While choices of actions arise from a frame, actions then create ‘facts on the ground’ which reinforce the frame. In this way, actions based on ‘taken-for-granted’ framing assumptions create a reality in line with the underlying frame. Over time, frames become so embedded in ways of working that they are difficult for participants to see, and harder to reflect on or challenge. Laws and Rein argued that this arises from the needs of policy makers not only to understand a problem, but to know how to act to address it. What they already know how to do can therefore reinforce their approach to addressing a problem.

4.2.2.2. Frames and narratives

Any given framing will give rise to a narrative, where narratives are

“...simple stories with beginnings defining the problem, middles elaborating its consequences and ends outlining the solutions.” (Leach et al., 2010a, p.45).

Therefore, how a problem is framed shapes how the solution is envisaged; and the stories told about a problem (and its solution) “...link different system framings to particular goals and values.” (ibid p.49)

While it can sometimes be difficult to observe framing assumptions, or the beliefs and interests of different actors, it is possible to hear their narratives, and see their actions. Examining the stories stakeholders tell about what they are doing can reveal their underlying frames. This is the basis of narrative analysis as a methodology. Taken-for-granted positions can be revealed by examining what narratives consider and what they leave out (Dryzek, 1997). This approach can also reveal whose voices have been excluded from a story (Leach et al., 2010a).

4.2.2.3. Narrative analysis

Narrative analysis is a method to identify and examine the stories people tell to make sense of complex contexts (Roe, 1994); and as a tool to discern underlying frames in contention.

Roe described different types of narratives: policy narratives (with “beginnings, middles, and ends”); arguments (with “premises and conclusions”); ‘nonstories’ e.g. circular arguments which do not have a narrative logic; and ‘counterstories’, which challenge the dominant narrative (ibid p.3).

Narratives provide guidance for decision-making and are therefore instrumental to policy implementation. Roe (1994, p.5) further argued that stories that provide clear guides to action will retain their strength, even in the light of contrary evidence, because they enable decisions to be made. Therefore, policy narratives that reduce apparent uncertainty can remain in place even if they are not accurate.

Laws and Rein (2003, p.202) similarly explored the factors which can stabilise a dominant framing in the face of challenges, or undermine it. While doubts and uncertainty about the accuracy or relevance of a story may create opportunities for challenges to prevailing frames, they can also create difficulties for people trying to make sense of problems. Often, dominant narratives persist because they “...fill the void that doubt generates.” Attempts to challenge a dominant narrative, by increasing uncertainty, may strengthen it instead.

They observed that when the dominant narrative provides a compelling story, alternative narratives will not take hold. Stories or critiques that are complex or do not suggest simple courses of action will stabilise, rather than challenge, a dominant narrative.

Leach et al. (2010b, p.372) similarly argued that, in such moments of contestation, actors upholding the dominant narrative will seek to retain stability, rather than opening up policy debate to complexity and plurality. However, a narrative remains dominant not only because of its value in defining required policy actions, but also because of who is telling it. Power held by those telling different stories is relevant to the affective power of those stories.

4.2.2.4. Power

An examination of policy documents and meeting minutes does not normally reveal power dynamics between participants in a debate, and how these may have influenced decision-making (Bhutani, 2013). Documentary research does not often show unequal access to knowledge, information or influence between different stakeholders; or whether some groups have been excluded because they do not hold forms of knowledge considered relevant in policy deliberations (Hajer and Wagenaar, 2003).

However, Roe (1994, p.14) argued that an examination of conflicting narratives about an issue can reveal power dynamics and excluded voices. Roe considered that power becomes visible through observing which narrative wins out, because this is an indicator of who has the information and resources to shape "...how that issue is perceived, communicated and managed".

Identifying different narratives reveals stories questioning the dominant narrative, and its underlying framing, alongside the actors presenting alternative narratives. This helps to "...clarify just whose uncertainty and complexity are at issue" (ibid p.11).

Roe argued that the dominance of a narrative, especially in the face of counter-narratives, demonstrates the power of those actors telling it. Therefore, identifying dominant and alternative narratives can indicate where power lies in a debate. Similarly, building on the work of many authors, Smith (2009) argued that how key actors view the world shapes the world. Those who hold political, economic or institutional power are able to implement policy solutions arising from their narratives, thus reinforcing them.

Clapp and Fuchs (2009) explained this process in their examination of how corporate actors gain and maintain power in the context of the 'corporate food regime'.

They examined how corporate actors use their power and authority to develop legitimacy in their relationships with the state and civil society to shape discourses in their favour – for example, the discourse of GMOs as food for the poor (Clapp and Fuchs, 2009, p.7).

They suggested that corporate influence enables them to

“...have a say in what is on the agenda and what is not, and to shape the distribution of the costs and benefits of the resulting rules and regulations.” (Clapp and Fuchs, 2009, p.8)

They identified three forms of power, in addition to market (economic) power, used by corporate actors: instrumental, structural and discursive powers.

- Instrumental power: direct power / influence of one actor over another e.g. through lobbying, use of financial or other resources. Instrumental power derives from economic power i.e. firms can lobby and get access to institutional processes because of their value to the economy (Newell, 2009)
- Structural power: shaping the structures within which actors operate e.g. influencing agenda setting and making some alternatives more or less attractive even before policy makers have started to consider their choices. For example:

“The structural power TNCs derive from the ability to punish and reward countries for their policy choices by relocating investments and jobs...” (Clapp and Fuchs, 2009, p.9).

Structural power can therefore arise from economic power. Structural power is also enacted through governance regimes such as private standard setting.

- Discursive power: this is

“...a function of norms and ideas and is reflected in discourse, communicative practices, and cultural values and institutions...policy decisions are...a function of discursive contest over the framing of policies...” (ibid p.10).

Through the exercise of these forms of power, corporations and other stakeholders are able to reduce contestation and so maintain the stability of the regime.

Actors use different forms of power to mutually reinforce their positions. For instance, actors will only successfully influence a discourse if they have political legitimacy, because a position will only gain traction in public debate if it is considered to have come from a trusted source. This legitimacy can be created through the exercise of structural power (Clapp and Fuchs, 2009).

Similarly, discursive power gives “...support and credibility to key state and corporate accumulation strategies.” (Newell, 2009, p.264): the discourse is shaped to bolster the intertwined economic interests of state and business.

In this way, dominant narratives may serve a set of powerful interests and may maintain, and be maintained through, structural and other forms of power. Leach et al. (2010b, p.372) considered that:

“...narratives...interplay in ways shaped by politics and power. ...contextually powerful institutions assert particular narratives and framings, so that it is these that become interlocked with strategies of intervention and ensuing pathways of system change, marginalising alternative narratives in the process.”

While other indicators of power may be observable in a policy arena, consideration of narratives can reveal how power is enacted.

4.2.2.5. Understanding policy processes

Keeley and Scoones (2003) examined the interplay of narratives, actors and political interests. By focusing on each in turn, they considered “...three different approaches to understanding policy processes.” (Keeley and Scoones, 2003, p.25). They argued that:

“While not completely distinct, each suggests different conceptual perspectives on the relationship between knowledge, power and policy.” (ibid)

They proposed that understandings of policy processes and policy change could be illuminated by looking through the three lenses of actors, networks and practices; discourses and narratives; politics and interests; and where they intersect.

They also highlighted the political nature of policy-making, including the interaction of competing interests and agendas and the way in which the framing of a policy problem delineates the knowledge and evidence called upon to address it.

From this analysis, they developed a conceptual framework for policy process analysis, linking the three identified elements shaping policy processes:

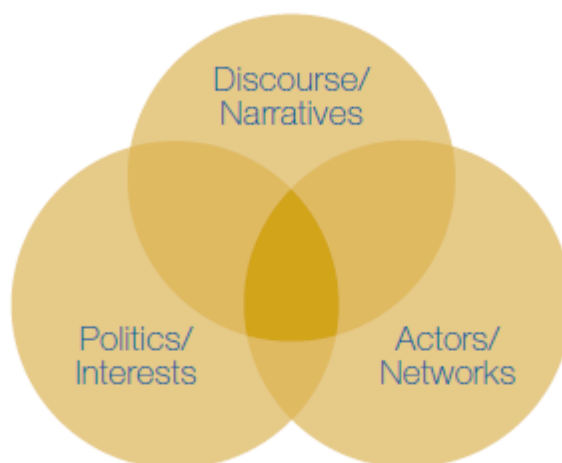


Figure 4.1: Conceptual framework (KNOTS, 2006, p.4).

This framework draws attention to the interactions between factors influencing policy processes, to help shed light on questions of “...how problems and policy solutions come to be defined, by whom, and with what effects?” (ibid, p.3)

This thesis uses the conceptual framework illustrated in Figure 4.1 to examine policy-making processes in CGIAR, with a particular focus on PGR management and CGIAR's role as a provider of public goods. The framework builds on the narrative analysis approach described in section 4.2.2.3, expanding it by considering how narratives about PGR management and CGIAR's mandate to provide public goods were upheld or challenged by different actors with varying political interests. Archival material was examined to identify different narratives about CGIAR's GPG role; the actors and networks associated with each narrative; the politics and interests of the different networks and the (different forms of) power they held; and the policy spaces within which policy-making took place and narratives were debated.

Using these conceptual tools, the case study data were analysed to examine questions about the evolution of CGIAR's policy directions on PGR and GPGs. This conceptual approach aims to address questions of directionality in policy making (how a policy approach is maintained and why other approaches are excluded), and whose interests are served.

4.2.2.6. Directionality, distribution and diversity (3Ds)

Leach et al. (2010a) and others (e.g. Ingram, 2011) have called for policy approaches which incorporate an understanding of the complex dynamics within and between socio-technological systems. These contrast with linear approaches that often close down policy options, rendering invisible political contestation over policy goals and alternative pathways to their achievement. Leach et al. (2010a) called instead for an approach which highlights the multiple possible pathways to different societal goals, and which underlines the political choices behind particular models of development and the technological choices associated with them.

The concepts of directionality, distribution and diversity (the 3Ds), articulated across a number of papers produced by the STEPS Centre (e.g. Stirling, 2009, Millstone et al., 2009), can provide tools to examine the possibility of different outcomes depending on directions of change in policy processes.

Stirling (2009) considered that the establishment of a dominant discourse makes alternative pathways to, and understandings of, progress invisible (ibid p.10). The dominant understanding of the direction of progress becomes the only possible way forward, and other possible pathways are then dismissed (discursively) as un-viable. This reduction of debate about possible pathways reduces political contestation. Treating the problem as technocratic and managerial renders the politics of decision-making invisible (ibid p.15).

From this analysis, Stirling articulated three concepts challenging linear policy approaches:

Directionality: this focuses attention on “...the fact of there being alternative possible orientations for progress.” (ibid p.5)

Stirling (ibid, p.19) argued that if progress is seen as unidirectional, then the costs and benefits are inevitable and the price to be paid for progress; but if multiple pathways are considered (directionality) then the vulnerability of some groups to the outcomes of some technological choices can become issues of social justice and equity.

Distribution: consideration of the costs and benefits to the full range of stakeholders affected by different directions which could be chosen. Because of these differential effects, there is a need for “...greater democratic agency, political accountability and social equity...” (ibid, p.5) in decision-making about directions of change.

Diversity: this focuses on “...the value of nurturing more plural discourses...” (ibid) in choices of pathways, as well as recognising the diversity of pathways that might be taken, and the possibility of plurality in approaches. It also takes into account the range of contexts, values, and interests affected by policy choices, and therefore further reveals the political dimension of policy processes.

By applying these three concepts to policy making processes, it is possible to ask normative questions about the impact and outcome of different policy choices:

Directionality: what is the policy for, what is the end goal?

Distribution: Who is policy for, who gains and who loses?

Diversity: What sorts of policies are needed and how many different policies, to meet the needs of the diversity of stakeholders affected by policy decisions?

Stirling presented three stylised characterisations of ways of understanding progress. The first privileges dominant discourses and power dynamics:

“Only the direction favoured by dominant interests constitutes progress. Any apparent alternative would thus be inherently against progress. Overall benefits can be assumed to outweigh drawbacks. Finding the right distribution of these is largely a matter for incumbent institutions acting through existing **markets**.” (Stirling, 2009, p.22)

The second defines progress similarly to the first but asks whether “...overall dynamic benefits exceed drawbacks?” (ibid p.23). If benefits exceed costs, then the direction chosen is valid, but should include a means to manage the costs. “Deciding on this is an essentially technical matter for **economics**.” (ibid)

The third approach “...fully encompasses the implications of the plural model of progress outlined here.” (ibid). It questions the direction, how costs and benefits affect different groups and how different actors might value the relative costs and benefits.

“Deciding on which direction presents the right balance is inherently a matter for responsible and accountable social choice through reflexive institutions and deliberate democratic **politics**.” (ibid)

The 3Ds, and directionality in particular, question why one technology rather than another is supported by institutional and economic infrastructure, and why this is the direction taken rather than any of the many other possible directions available. In raising the question, other directions become visible, and further questions arise about how power relates to the choices made. While it might be possible to imagine any number of directions of innovation, choices are delineated by the political space available for such choices to become viable options.

4.2.2.7. 3Ds and agricultural research

The 3Ds approach identifies the existence of many possible different directions, highlighting that they are not all equally supported by the wider socio-technical or political-economic considerations. For instance, dominant ‘productivist’ discourses about the functioning of the global food system assume that increasing agricultural production will reduce hunger. Mainstream policy approaches have therefore pursued increased productivity, without questioning the distributional impacts of technological and policy choices. But there is a body of evidence spanning decades challenging this assumption (Sen, 1981; FAO, 1997c; Meeker and Haddad, 2013). Those authors have argued that there is no aggregate scarcity of food. Instead they argue that hunger is caused by poverty and that impacts of policy decisions may be either disproportionately negative for poor people or exclude the needs and interests of the poorest and most vulnerable. Similarly, Feldman and Biggs have argued that, despite rhetoric putting food security at the centre of policy making, policy choices

“...often leave[s] as consequential, rather than constitutive, the need to address poverty and ecological sustainability.” (Feldman and Biggs, 2012b, p.149).

Millstone et al. (2009, p.4) applied the concept of directionality to the development of the global agri-food system and the place of IAR within that. They noted that:

“The **direction** of technological change in the food and agriculture sectors is intensely contested and deeply problematic.”

They considered that debates about forms of technological development (e.g. GM crops) can often mask more political questions about the direction of innovation:

“Rather than restricting policy debate to questions about the pace, efficiency and consequences of proceeding in the direction taken, there is a need to give

commensurate attention to choices about the direction to be taken, amongst alternatives. In relation to agricultural innovation, it is vital to ask not only 'how much?'; 'how fast?'; and 'when?' but also 'which way?'; 'what else?'; 'who says?' and 'why?'" (Millstone et al., 2009, p.5).

The concept of diversity also raises questions about whose values, interests and knowledge are taken into consideration in decision-making processes. Appreciation of the diverse forms of knowledge held by different groups involved in agricultural production, and the different values assigned to such knowledges by different actors in the food system, is a key point of contention in political debates about agricultural research. Stirling (2001, p.66) argued that

"...public participation is often approached purely as a matter of democratic process, rather than being equally about the limits of expertise and rationality ...".

Applying these concepts of directionality, distribution and diversity to the IAR system, Millstone et al. (2009) described attempts within CGIAR to explore different pathways, but noted the failure of such approaches to gain traction within the dominant IAR model. They argued – in line with the position taken by IAASTD (2009b) – that, as a result, the IAR system had not adequately served the needs of poor farmers in the global South, instead developing technologies which were of value to commercial farmers, including those in the global North. They further argued that alternative approaches, taking into account farmers' own knowledge and skills as innovators, would be more likely to result in technologies that met their needs.

Again echoing IAASTD, the authors called for a reconfiguring of the IAR system:

"If poor African farmers are to benefit from technological innovations, and become sustainably innovative, it will be necessary to re-configure the research system, transforming that system into one that is far more accountable to its intended beneficiaries, and conducted in more widely dispersed locations and engaging a wider range of stakeholders. ...Technological research and development agendas should therefore be reframed by reference to the needs, capabilities and aspirations of farmers, rather than by the technological opportunities for, and enthusiasms of, the researchers or by the corporate strategies of agrichemical, biotechnology or seed supply firms." (Millstone et al., 2009, p.11).

The thesis uses the concepts of directionality, distribution and diversity to inform questions about understandings of 'global public goods' within CGIAR policy-making processes, and the outcome for policy directions of diverse interpretations of CGIAR's GPG mandate.

Directionality: enables a consideration of social justice and equity issues relating to technological choices, i.e. consideration of alternative goods that might be provided, and the possibility of aiming for different societal goals.

Distribution: enables a consideration not only of whether goods are freely available to all, but also whether all groups have equal capacity to make use of them.

Diversity: enables a consideration of the range of goods that need to be public, taking into account the need for different technological choices for different contexts, values and interests; and considering that different values, contexts and interests should be equally provided for.

4.2.2.8. Research questions

These questions about understandings of ‘global public goods’ inform the analysis of narratives presented by different stakeholders within CGIAR, as part of the conceptual framework presented in section 4.2.2.5. The thesis applies that conceptual approach to analyse the empirical evidence about CGIAR’s policies and how they are made. It uses the framework to examine relationships between actors involved in IAR and the politics and power dynamics influencing decision-making about research priorities.

This approach informs the analysis of data presented in chapters Five, Six and Seven. In doing so, it seeks to answer the following research questions:

1. How did the role of, and strategy for, public IAR evolve in the light of the changing structure of, and pressures on, the global agri-food system between 1990 and 2012?
2. How was the concept of ‘public goods’ and CGIAR’s role as provider of ‘global public goods’ framed by different actors in IAR at different times?
3. How did competing framings of CGIAR’s role as a provider of ‘global public goods’ influence, and/or were influenced by, policy choices regarding its management of Plant Genetic Resources and Intellectual Property?
4. What are the implications of these policy choices for the direction of change in public IAR and for its intended end-users?

4.2.2.9. Narratives as unit of analysis

Narratives are articulated to make sense, for example, of policy responses to a specific event, or to create sense to justify policy choices. Narrative analysis is a method to reveal and examine underlying factors influencing those policy choices. It can therefore be a useful tool to explore issues of directionality, diversity and distribution in policy making e.g. what policy choices are made, how, by whom and the processes through which they are reinforced.

Narrative analysis can analyse syntax (the structure of a story), theme (what the story is about) or rhetoric (how the story is told). This research uses narrative analysis to explore themes. This is not just about the sequence of events, but about the different stories told about those events, how events are understood; and the policy positions arising from specific understandings. The analytical process is described in section 4.4.1 below.

4.3. Data collection methods

The main source of data examined in this thesis are documents held in CGIAR's public online document repository. Relevant documents from other sources were also examined, when they were not available in the CGIAR archive. In addition to archival research, interviews were conducted with 16 key informants representing a range of well-informed CGIAR stakeholders.

4.3.1. Archival research

The CGIAR repository is available online at <https://cgspace.cgiar.org/>; it contains over 4,000 documents, including minutes of meetings of all the main committees and sub-committees of the CGIAR system, annual reports, programme reports, policy documents and discussion papers. It is organised into communities (e.g. CGIAR Research Programmes, CGIAR Consortium) and collections (e.g. annual reports, impact studies). It includes a historical archive covering 1959 – 2009⁹. At the time the majority of the archival research was undertaken (2014-16), it was searchable by community, collection, date, author and subject. It has since been reorganised, and additional search mechanisms added.

Initially, the focus of research was the 2008 reform process. An attempt to understand why the reform had been undertaken revealed several underlying areas of contestation, which were not themselves the focus of the reform process. These included CGIAR's engagement in public-private partnerships, its management of PGRs and its use of IP. By tracing back these areas of contestation through the archives, it became apparent that there were long-standing differences in understandings of CGIAR's core mandate and different views on how CGIAR should act to deliver it. This led to a shift in focus for the thesis from CGIAR's organisational development to its institutional role in the wider agricultural research sector, and specifically its role as a provider of GPGs. The archival search was then directed towards identifying documents which presented discussion or policy development related to that role.

In order to identify documents where discussions on relevant issues were recorded, the repository was searched by subject. The search terms and subject tags used are listed in Table 4.1. This was supplemented by searching for documents from key internal bodies e.g. the System-wide Genetic Resources Programme (SGRP) and the Centre Directors' Committee (CDC), and cross-referencing with documents found from searching the subject tags. However, documents from *ad hoc* committees were difficult to find through either of these methods, so a full-text search was also used. In addition, documents presented to committee meetings were not always available in the repository (for instance if they were held in the archives of an

⁹ Available at <https://cgspace.cgiar.org/handle/10947/1>

individual Centre). For this reason, a number of important documents were located through Google searches. Other documents were located through searching other locations such as DFID and World Bank libraries.

This search process was triangulated with information from key informants, to cross-reference the locations of policy-making and to find documents mentioned in interviews. These were not always available in the repository, and additional searches were conducted through requests to CGIAR archivists and a World Bank Access to Information request. Nonetheless, some documents (such as those relating to the GPG Project Phase 1) have remained elusive. While the search process aimed to be comprehensive, it is not possible to claim that every document reporting on issues relating to PGR, IP and public goods has been examined.

The documents examined were noted in a spreadsheet which recorded the document's date, author, purpose, key topics, subject tags and location in the archive – see Table 4.2 for sample entries. The spreadsheet was initially created to record documents and cross-reference subject tags to identify what issues were discussed in the central policy making bodies of CGIAR. However, it developed into a tool for a first identification of narratives by the addition of a column in which positions reported in the documents, or presented by the authors, could be noted.

Approximately 250 documents were examined in this way. The spreadsheet was divided into three time-frames: 1971 – 1995; 1996 – 2006; and 2007 – 2012.

Table 4.1 Subject tags, in alphabetic order

Access and Benefit Sharing	Global public goods / global public goods
Biotechnology	Intellectual property rights / Intellectual Property
CGIAR change management	International Undertaking on Plant Genetic Resources
CGIAR genetic resources policy	IP Management in the CGIAR
CGIAR IA Principles	Open Access
Ethical issues	Participatory plant breeding
Farmers' rights	Plant breeders rights
Genebanks / CGIAR genebanks	Plant breeding

Global Crop Diversity Trust	Plant genetic resources
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The subject tags themselves revealed how issues and interests changed over time. For instance, 'Plant breeders rights' was an important subject tag to identify relevant documents up to 1995, but did not appear after that. Similarly, cross-referencing with other subject tags helped to identify which issues were topics of discussion over particular time-periods. This process also helped with following discussions and debates across subject tags. For instance, an issue might arise in one committee and appear under the subject heading 'Plant genetic resources' but then be taken up in another committee and labelled 'Plant breeders rights'. Further cross-referencing was undertaken by examining the minutes of particular committees whose position on key issues was relevant to the research questions, such as the Genetic Resources Policy Committee.

Finally, all the documents located were examined in chronological order. This revealed the time-periods when certain topics were discussed extensively, across a number of different internal bodies. This approach helped to build a clearer picture of where debate took place, who was involved and who was excluded, or how policy advice from one body was taken up (or not) in another.

There were some limitations to the approach taken. On a practical level, any search method is only as accurate as the information put into the system by the archivist. Subject tags were not consistently applied and varied over time. Small variations in the subject tag – such as 'food security' or 'Food security' – brought up different documents. In addition, it is a decision by the archivist how a document is tagged. For instance, documents covering seed research were not tagged with the label 'Plant genetic resources'. For this reason, triangulation was vital, following where discussions took place, and what documents fed into and out of them.

The spreadsheet was primarily used to keep a record of documents and their locations in CGIAR's archives. Having built up an overview of the locations and substance of debates on PGR management, IPs and GPGs, the documents were revisited to identify how those issues were discussed, what positions were presented in them, and which actors were recorded as having held different views. These were recorded in Word documents in which the contents of each document were described in more depth, and the perspectives presented in them were mapped. Through this process, a number of recurring perspectives were identified and contrasting narratives about CGIAR's role as a provider of GPGs emerged.

Table 4.2 Sample of information included in spreadsheet used for data collection and analysis

Date	Author	Title	Topics	Positions	Subject Tag	Additional Tags	url	Further comments
01/01/1996	CGIAR PSC	Report of the First meeting of the CGIAR Private Sector Committee	Setting up, agenda, work programme	Discussion of shared interests, complementarities, agreement on work programme, including biotech, IPR, genetic resources and biodiversity all under one sub-committee	Plant genetic resources	Biotechnology, CGIAR meeting 1996/05, CGIAR Private Sector Committee, CGIAR private sector relations, IARC private sector relations, Intellectual property rights, NARS private sector relations, Plant genetic resources, Private sector perspective, Proprietary science and technology, Research management	http://library.cgiar.org/handle/10947/1071	
01/04/1996	CGIAR Genetic Resources Policy Committee (GRPC); M. S. Swaminathan	Report of the Third Meeting of the CGIAR Genetic Resources Policy Committee	Responding to passing of CBD, and issues arising re ABS, farmers rights and IP	Takes a position in support of including Farmers' Rights as an issue to be addressed with as much seriousness as IP issues, while noting that they are mostly a national issue.	Plant genetic resources	CGIAR meeting 1996/05, Biodiversity, Convention on Biological Diversity, Ex situ conservation, FAO, Farmers rights, Genetic resources policy, Germplasm access, Germplasm collections, Germplasm exchange, Intellectual property rights, IPGRI, Plant genetic resources, UPOV, World Food Summit	http://library.cgiar.org/handle/10947/1183	9 documents with subject tag 'farmers' rights' date from 1995 (2nd meeting of GRPC) to 2001 (13th meeting of GRPC)

						1996, Commission on Genetic Resources for Food and Agriculture		
01/04/1997	Miguel A Altieri	The CGIAR and Biotechnology: Can the Renewal Keep the Promise of a Research Agenda for the Rural Poor?	This is described as the 'personal views of CGIAR NGO Committee Chair'	Highlights the range of problems with CGIAR's approach to biotech, from the NGO perspective and calls for research to see whether the same supposed benefits to productivity couldn't be reached through agrobiodiversity methods. But generally questions the focus on biotech and cautions against the approach to IP and private sector partnerships which work on biotech would require	Biotechnology	CGIAR meeting 1997/05, Biotechnology, CGIAR NGO Committee, CGIAR private sector relations, CGIAR stakeholders, IARC collaboration with NGOs, IARC NGO relationships, Participatory research, Poverty, Private sector research	http://library.cgiar.org/handle/10947/1505	Doesn't come up under any of the other key search terms, only know it exists because of earlier work looking at the positions of particular partnership committees

4.3.2. Interviews

There are several limitations to documentary data. Documents may not contain information of relevance to the research questions or they may not be accurate, both in terms of what is included and what is omitted (Richardson et al., 1965). Documents such as meeting minutes are often an interpretation of events, and may not accurately reflect the range of opinions expressed in debate; or may only record final decisions, not discussions prior to the decisions.

In addition, documents are often “...of little value in uncovering motives, opinions, or any other information usually elicited by skillful [sic] questioning.” (Richardson et al., 1965, p.18)

Interviewing participants in the debates has the potential to provide added insights, nuance and depth to understandings gained from archival research. Therefore, the archival research was supplemented with interviews with a range of CGIAR stakeholders.

Types of stakeholders were identified from the documents, and interviews conducted with people selected because of their institutional perspectives. Interviewees included donors (both public and private), CGIAR staff, CGIAR policy makers, and civil society representatives.

Relevant individuals were identified through publicly-available information (e.g. institutional websites) and/or through personal contacts in academic and professional fields. Sixteen people were interviewed in total.

Interviews were ‘semi-structured’, beginning with the same set of questions for each interview. These served as an *aide-memoire* for the interviewer, and to ensure that key areas were covered. Each interview was then tailored to the particular interests and expertise of the interviewee, and during the course of the interviews, questions were customised according to answers received.

Interviewees were provided with information about the nature of the research and how the interviews would be used, to enable them to give informed consent, as required by research ethics standards. A template information letter and consent form is provided in Appendix Two. Interviewees also chose whether to remain anonymous, whether to allow the use of direct quotes and whether they wanted to see transcripts of their interviews.

Interviews were one-to-one and conducted in person where possible but often over Skype or phone. Interviews were recorded in almost all cases, where the interviewee gave permission to do so. All were transcribed as accurately as possible, given the limitations of the quality of the recordings. The transcriptions were then treated as data sources and analysed alongside archival materials. They are referred to in the empirical chapters using an anonymised interviewee identifier (listed in Appendix Three). Interviewees decided the level of anonymity

they required and how they wanted the information they provided to be used. This is reflected in the information provided about interviewees in Appendix Three.

The topics covered in the interviews evolved to a certain extent over time as the focus of the thesis evolved. However, in broad terms, the interviews covered issues such as:

- The 2008 reform process: origins of impetus for reform and impact
- CGIAR's vision, mission and goals
- CGIAR's position in the wider IAR arena
- CGIAR's role in GPG research
- CGIAR's stakeholders
- Partnerships and donor relations
- The role of science in Agricultural Research for Development (AR4D)
- CGIAR's impact pathways

Interviewees chose whether to respond in a personal capacity or as a representative of an organisation. In all cases, the interview began with the interviewee describing their own position in, or in relation to, CGIAR.

4.3.2.1. Approach taken

Richardson et al. (1965) stated that interviews can be used to validate interpretations of data found from other methods, to provide more detail and to counter the researcher's subjective interpretation of the data. Interviews enable a researcher to test ideas and analysis arrived at from examination of documentary material and help ensure that perspectives presented are those of the participants, rather than the researcher's own.

Interviews were conducted with this in mind. Interviews conducted early in the research process also contained an element of fact-finding, particularly where the perspective of the interviewee was not visible in CGIAR archives e.g. donor perspectives. Early interviews also highlighted areas of contestation, which were then investigated further through the archival research.

However, the main purpose of conducting interviews was to assess opinions, gather interpretations and test ideas which had arisen as interim hypotheses from studying the archival materials. The interviewees provided a range of opinions, adding to understanding gained from documents about how different perspectives had interacted during policy-making processes. Their perspectives also helped to evaluate the reliability of the interim hypotheses;

and to fill gaps not covered by the documents. In this way, the interviews added depth and detail to the case studies.

Dexter (1970) argued that un-structured interviews enable the interviewee to identify the issue they consider most relevant in relation to particular research questions. Each interviewee inevitably focused on their own areas of expertise, which highlighted the range of different perspectives on specific issues. For instance, the interviews revealed a range of positions on CGIAR's 2008 reform process, on its role in IAR and its approach to AR4D, including shifts over time in how ideas about its mandate should be fulfilled. This enabled a clearer focus for the thesis, and an examination of documentary data on the basis of insights from interviews.

The interviews were also an opportunity to test the particular characteristics of narratives identified from the archival research, by observing whether the narratives were reflected in the views expressed by different stakeholders.

4.3.2.2. Considerations of using interviews

Although interviewees were institutionally aligned with different CGIAR stakeholders, the interviewees often expressed their personal perspectives, rather than necessarily representing the views of others in a similar role within CGIAR. Employees in particular are likely to have a wide range of views depending on where they are, or were, employed in the organisation and what their experiences have been. Conversely, other interviewees, such as the DFID staff member, spoke in a professional rather than personal capacity and presented the official 'line' on DFID's relationship with CGIAR. Therefore, a degree of judgement was required in interpreting and analysing interview responses. Opinions expressed had to be contextualised through broader knowledge of the topic, and of the position and interests of the interviewee (Bogner et al., 2009).

This contextual knowledge was also necessary to target questions effectively, and to elicit information that only that respondent may have had.

In addition, information derived from interviews may not be entirely reliable, because of failures in the interviewee's memory, because of selective reporting or because of the impact of hindsight. The views expressed in an interview might not be an accurate reflection of positions held at the time. Therefore, while interviews are a useful tool to triangulate insights derived from archival research, triangulation should be a two-way process.

4.4. Data analysis

4.4.1. Application of Narrative Analysis approach

Following Dryzek (1997) and Feindt (2013), narrative analysis includes the following steps:

- Identify and describe different narratives visible within a debate, by assessing texts and interviews for who said what, in what context
- Identify their associated policy ideas and underlying framing assumptions
- Identify the institutions / actors associated with each narrative or policy position
- Identify how those stakeholders operate within the policy making process
- Identify key moments when the narratives (and underlying framings) compete
- Draw conclusions about how the narratives and their proponents have interacted and to what end i.e. were dominant narratives – and their underlying framings – challenged, leading to changes in policy directions? If not, why not?

Laws and Rein (2003, p.175) observed that “...opportunities for reshaping the distribution of influence and resources among groups involved in a policymaking process...” arise at “...moments of doubt when accepted stories are challenged...and an indeterminate situation arises that requires interpretation.”

On this basis, the research focused on three key time-frames where events external to CGIAR challenged dominant narratives about its role in the global agri-food system:

- Agreement of the Convention on Biological Diversity and responses to it (early 1990s)
- Negotiations over the International Treaty on Plant Genetic Resources for Food and Agriculture (late 90s/early 2000s)
- The 2007-8 food price crisis and CGIAR’s reform process (to 2012)

Additionally, the research examined CGIAR’s formative narratives i.e. the ‘accepted stories’ that were challenged through the processes described in the sub-case studies. Similarly, the research examined relevant data beyond the core time-frames where necessary to contextualise debates.

Through an examination of archival documents, the research identified and described different narratives about CGIAR’s roles and responsibilities as holder of PGR ‘in trust’, including different narratives about ‘public goods’ and the relationships between public and private actors. These narratives were associated with different stakeholders and varied across time. The changes in narratives across time-frames and across stakeholders were examined,

alongside the interaction of these narratives in policy making processes i.e. which won, and why.

The narratives were analysed with reference to understandings of CGIAR's role as a provider of public goods, and how policy choices limit or enable enactment of that role. Analysis further examined how understandings of that role influence directions in CGIAR's research agenda. For example, different narratives contain conflicting interpretations of what 'public goods' CGIAR should deliver, who CGIAR is expected to work with and who should participate in policy-making decisions.

This narrative analysis of CGIAR's policy decisions revealed the interplay of the underlying politics of different stakeholders and how power has been exercised. It also revealed how the positions of different stakeholders align with broadly recognised framings of the functioning of the global agri-food system, identified in Chapter Two.

4.4.1.1. Practical approach to narrative analysis.

As discussed above (section 4.3.1), to identify narratives in policy debates within CGIAR, documents such as meeting minutes and policy statements were examined. Such documents reflect decisions made, presenting the dominant view. Therefore, it was necessary to undertake a process of tracing back discussions and debates which fed into final policy decisions. This enabled an analysis of where specific issues were debated (i.e. which internal bodies in CGIAR were concerned about particular issues); how issues were discussed by different actors; how stories interacted across time-lines i.e. how a story told by one group influenced perspectives of another.

Documents were examined to identify policy positions presented by different actors in the debates at different times. Through tracing how these positions framed problems and solutions, narratives were constructed.

The process of narrative construction is inevitably subjective, guided by the researcher's perspective. Another researcher might see different narratives in the debate. For this research, narrative construction focused on questions of how different policy positions defined Global Public Goods.

Narratives were derived directly from the archival material and interviews. Whenever possible, the narratives were tested through interviews; and cross-checked against narratives visible in wider debates about the global agri-food system (i.e. narratives identified by researchers and actors across policy and academic literature). Nonetheless, there was no expectation that narratives visible within wider global agri-food system debates would be visible within CGIAR

policy making. Instead, the possibility that narratives within the wider system were not present was part of the analysis. The range of narratives with which CGIAR stakeholders engaged provided insights into which voices and actors were able to influence policy making.

Roe (1994) argued that narrative analysis involves recognising the existence of competing narratives, which reveal the complexity, uncertainty and controversy surrounding a given issue. Identifying the existence of a range of narratives enables a discussion about which narratives have been neglected or marginalised, and what that means for policy decisions.

4.4.2. Operationalising conceptual tools

As outlined above, the research used narrative analysis to identify different narratives about PGR management and CGIAR's role as a provider of public goods. By comparing how key elements of these narratives are understood, underlying framing assumptions could be identified. Using the conceptual tools of policy process analysis (see figure 4.1), the research examined how the identified narratives, and their underlying framings, were supported by different groups of actors, with varied interests; how the narratives interacted with each other to shape policy decisions; and how different understandings of 'global public goods' contributed to shaping policy directions. These analytical tools underpin the approach to exploring the archival data.

Conflicting framings were revealed through narrative analysis, while the conceptual tools of policy process analysis enabled an examination of how those frames were positioned in the broader policy space of debates about the politics of food and global food system functioning. The conceptual approach in the first instance helped to illuminate how different stakeholders in CGIAR have defined its role as provider of GPGs and the policy implications of those different framings. But the relationships between internal and external frames connected the perspectives of participants in CGIAR's debates to wider policy debates about the global agri-food system, including through an examination of the relationship between actors and networks within and external to CGIAR. This enabled an exploration of how directionality (and diversity) in agricultural research related to directionality and diversity in the food system.

By applying a policy process analysis approach to CGIAR's role as a provider of GPGs, the research asks new questions about competing understandings of 'public good(s)' in the context of the global food system. In particular, it engages with concepts of development, the politics of participation, questions of 'who is the public' and how different publics can participate in defining public goods and shaping policy for their provision.

4.5. Limitations of the research design

In addition to the practical problems of archival research discussed above (section 4.3.1), the inevitable need to bound the research puts some limitations on data collection and analysis. These limitations, and their implications for the research findings, should be acknowledged.

The research focused on CGIAR policy making at the central level and does not examine policy or practice at the Centre or country levels. Discussion therefore remains at the level of policy development rather than engaging with the practical details of policy implementation or the consequences for programme work of policy decisions. While some of the practical difficulties of implementing complex and sometimes contradictory policies were discussed at the central level, the research approach inevitably missed out an examination of the implementation strategies of different Centres, and the interactions between Centres which may have influenced policy decisions. The approach risks portraying CGIAR as monolithic, when it is anything but.

A further limitation is the research focus on CGIAR's management of PGR, which meant that other policy areas were not explored. Debates that took place concurrently on related issues were only examined when they affected policy making about PGR management, or challenged the dominant narrative about CGIAR's mandate, but were not themselves explored in depth.

The decision to focus on PGR management can be justified because crop development has been at the core of CGIAR's mandate since its inception. However, this focus risks misrepresenting the totality of CGIAR's work. In examining this central issue, the research risks falling into the trap of marginalising work and issues that were marginalised within CGIAR, such as farmer-led research or participatory plant breeding. Attempts to overcome this limitation were made by triangulating subject searches with stakeholder searches i.e. examining what different groups of stakeholders were concerned about at specific times, and considering how, and the extent to which, those concerns were reflected in central level policy making. Using a narrative approach is also an attempt to address this concern because narrative analysis aims to make visible perspectives and stakeholders challenging dominant narratives.

In addition, examination of one policy area does not take into account the wide variety of work on the ground being conducted in an organisation of the size and complexity of CGIAR. Different parts of CGIAR have different priorities, interests and approaches; throughout its history it is possible to find examples of work that challenges CGIAR's central stories about itself and its ways of working. A key question for this research is why such work has remained

at the margins of CGIAR's programmes; and also why it has continued to exist. A challenge for data collection has been to identify alternative perspectives while maintaining the research focus.

4.6. Conclusion

This chapter has outlined the methodological approach used in the thesis. It has presented the data collection methods used, the analytical approach taken to analysing the data that were collected, and presented the thesis' research questions. It has also considered some of the limitations of the chosen methodology.

The previous chapters have laid out the research context, analytical framework and methods used in the thesis. The next three chapters present the empirical data, describing the development of CGIAR's policies on PGR management and IP, and changing approaches to its GPG mandate.

5. The development of CGIAR's policies on plant genetic resources - 1990 to 1995

5.1. Introduction

This chapter describes the development of CGIAR's policies on plant genetic resources (PGR) management and intellectual property (IP) from 1990 to 1995. The first section of the chapter presents a summary of debates on those issues from 1971 to 1990, to set out CGIAR's founding framings and to provide context for the discussions that follow. The second section of the chapter focuses on developments from 1990 to 1995, when CGIAR's approaches to PGR management were shaped by major changes in global regulatory frameworks including the agreement of the Convention on Biological Diversity (CBD) and the 1994 WTO General Agreement on Tariffs and Trade (GATT). The chapter also charts CGIAR's approach to relations with private sector actors and its attempts to develop an IP policy, both of which influenced its policy decisions on PGR management.

The first section of the chapter describes CGIAR's establishment by a small group of US-based foundations, industrialised country governments and international organisations. The founding group members were proponents of a productivist model of agricultural development (see section 2.2) and saw the role of agricultural research as supporting a process of industrialising agricultural production in low-income countries (LICs). During the 1980s, this approach was challenged by civil society actors and others, who questioned the environmental and social impacts of agricultural industrialisation strategies. CGIAR's limited membership and closed decision-making processes were also challenged.

The second section of the chapter examines the impact on CGIAR's policy processes of rising concerns, including among CGIAR's funders, about environmental issues, exemplified by the agreement of the CBD (section 5.3.1.3). It also examines the impact of pressure from governments in the global South and others for greater participation in global policy fora, and broader accountability in governance processes affecting the use and management of PGR. The chapter describes CGIAR's responses to these new pressures and its actions to retain its central role in an expanding international agricultural research system. It examines the interplay between public and private sector actors, governments and regulatory bodies, and their interests in shaping policy directions for PGR governance.

During this period, policy directions were decided by a small group of internal stakeholders, primarily the Technical Advisory Committee (TAC), the CGIAR members and Centre Directors. However, the new global frameworks forced CGIAR to work in new ways and to bring a wider

range of voices into its decision-making bodies. The impacts of those changes are explored in Chapter Six.

5.2. Brief overview of history

The focus of the thesis is on CGIAR's management of plant genetic resources (PGR) from 1990-2012. This section of the chapter provides relevant background to the case study period, to demonstrate the formation of key founding narratives that shaped CGIAR's approach to PGR management for decades to come.

5.2.1. Origins of CGIAR

CGIAR originated in international agricultural research centres (IARCs) established in the 1950s by the Rockefeller and Ford Foundations. The first centres were the International Rice Research Institute (IRRI) and the International Maize and Wheat Improvement Centre (CIMMYT), established to improve staple crop production at the global level (focusing on improving yields in rice, wheat and maize); and the International Institute of Tropical Agriculture (IITA) and the International Centre for Tropical Agriculture (CIAT) established to address productivity levels in subsistence farming (McCalla, 2014). As funding needs expanded, the two foundations brought together a wider group of funders, who established the Consultative Group on International Agricultural Research (CGIAR) in 1971. CGIAR was co-sponsored by FAO, the International Bank for Reconstruction and Development (IBRD) (as the World Bank was known at the time) and UNDP, with the chair and headquarters provided by IBRD. Membership of the Group consisted of co-sponsors, national governments (all industrialised countries), regional development banks and foundations (CGIAR Secretariat, 1971, p.2). The Group was supported by a Technical Advisory Committee (TAC), which had the role of identifying gaps in research, providing information to donors on priorities for investment and evaluating the quality of the science provided by the different centres (CGIAR Secretariat, 1971).

Organisationally, there was an informal structure, based (ostensibly) on three core principles of consensus decision-making among Group members, centre autonomy and donor sovereignty (Ozgediz, 2012). A further element of CGIAR's founding narrative was that science (as conducted in the Centres) was the key factor determining donor funding priorities. This meant that power over agenda setting was primarily in the hands of scientists at the Centres and in TAC.

CGIAR was founded by a network of international organisations, foundations and industrialised country governments. It was founded on the assumption that increasing agricultural

production and productivity would reduce hunger and poverty in low income countries (LICs), and that scientific research could provide the means by which to achieve these increases. It focused on specific technical problems, in isolation from local political, social or environmental contexts. Its role was to fill perceived gaps in the research provided by national agricultural research systems (NARS) and/or by commercial companies i.e. its founding role was predicated on an assumption of the need for, and relevance of, internationally applicable agricultural science.

5.2.2. Governance issues prior to 1990

In the late 1970s and early 80s, the CGIAR System grew rapidly with the addition of new Centres. Seven new Centres were included by 1976, of which three were focused on commodities¹⁰, one on plant genetic resources (PGR) and three on farming systems or ecosystems. However, donors were primarily interested in the crop breeding work, because of the perceived successes of new varieties of rice and wheat produced by IRRI and CIMMYT and distributed during the Green Revolution. They therefore prioritised a commodity approach, focusing on single crops rather than crops within farming systems (McCalla, 2014).

During the 1980s, CGIAR's work was influenced by critiques of its initial approach, which had been based on a 'pipeline' model of research in which scientists identified research priorities to increase production and tried to deliver the outputs of research to smallholder farmers (Hall et al., 2000). Concerns were raised about the impact on poverty of this approach, which separated the production of new technologies from the diverse socio-economic contexts in which they were to be used (Oasa, 1987). CGIAR's failure to interact with the complexities of rural poverty was highlighted by the development of alternative narratives, such as the participatory approach (Thompson and Scoones, 2009) and Farmer Participatory Research methods. Whilst some scientists within CGIAR engaged with these participatory agendas, TAC reconfirmed Centres' primary focus on "...component research, for technology generation in their commodity programs." (CGIAR TAC, 1984, p.77) Thus, despite the inclusion of new Centres and new research areas, such as research on ecosystems, CGIAR retained a core focus on commodity crop breeding.

¹⁰ In the CGIAR context, the term 'commodity' denotes a single crop, rather than a product that is traded. Therefore, commodities included not just global staples but also other crops which were of importance in the diets of poor people, such as roots and tubers.

5.2.3. PGR management debates prior to 1990

CGIAR's initial research approach, described above, required the collection and conservation of PGR for use in future breeding programmes, and the free exchange of such PGR between researchers. FAO similarly considered that future global food security might depend on traits discovered through such collection and research processes. Soon after CGIAR's formation in 1971, FAO proposed the establishment of "...a network of genetic resources centres..." (FAO, 1971, p.1) to enable the "...completely unrestricted exchange of plant materials and data relating to them, between developing and developed countries." (ibid)

This network would both conserve genetic resources and ensure free exchanges of PGR. In line with CGIAR's position, FAO argued that such conservation and exchange strategies were necessary to ensure that future crop development contributed to increasing agricultural production in LICs.

TAC members agreed on the need to protect genetic diversity:

"Agricultural progress has depended heavily on new plants or beneficial characters introduced from the world pool of germ plasm represented by primitive cultivars and wild or weed species. This irreplaceable resource is rapidly being eroded by the expansion of cultivated area, and by the spread of new and more sophisticated crop varieties..." (TAC Working Group, 1972, p.i)

The narrative, as stated by TAC, contained no critique or analysis of the role of CGIAR-produced varieties in this process, but moved from stating the problem as loss of genetic diversity to proposing genebanks as a solution.

"In order to conserve genetic resources against the needs of the future without retarding agricultural expansion it is recommended that a global network of genetic resources centres be established as rapidly as possible..." (ibid)

This marked the emergence of a narrative about the importance of genebanks in conserving PGR, and specifically to conserve PGR required for future agricultural development. This TAC meeting articulated several other narrative tropes which underpinned CGIAR's approach to managing PGR for decades to come:

- genetic diversity of different regions of the world is inter-connected
- access to PGR from other countries is vital for agricultural growth and development in countries that have not yet embraced 'modern' agriculture
- agricultural growth and development require improved seed technologies, and farmer-bred varieties are of limited value in the push to improve agricultural productivity in LICs

- the primacy of production and productivity above other functions of agriculture, or other characteristics of germplasm.

Despite concerns about the loss of genetic diversity, TAC nonetheless stated that:

“In order to increase production, it is necessary to replace primitive cultivars and landrace populations with more nutritious or more adaptable higher yielding strains” (ibid p. 4).

i.e. the project of modern agriculture should be to replace ‘primitive’ varieties with more productive varieties. At the same time, the ‘primitive’ varieties should be conserved in case they contained genetic traits that might be of value in future crop development. This narrative placed both CGIAR’s research work and its conservation work at the centre of the project to increase agricultural productivity.

In 1974, the International Board for Plant Genetic Resources (IBPGR) was established as a CGIAR Centre, with the role of coordinating the handling of PGR in CGIAR, including relations with FAO.

By 1980, CGIAR had embedded productivism into its objectives, with TAC stating that CGIAR’s focus should be on “...increased production of important food commodities...” (CGIAR TAC, 1980a, p.1). To that end, the commodity Centres prioritised plant breeding research programmes. Several also maintained genebanks, which provided access to PGR for breeding programmes. IBPGR’s role was to support and improve the work of these Centres, by setting standards and providing guidelines for genebank management, and carrying out conservation work that was “...beyond that which could be handled by the commodity and production-oriented centres” (ibid p.5).

TAC continued to dismiss concerns about the impact of CGIAR's breeding programmes on biodiversity, stating:

"...the role of IARCs in the development of new varieties...had little unique relevance as regards the problems of genetic erosion." (CGIAR TAC, 1980b, p.64)

Instead, they argued that CGIAR's plant breeding work contributed to increasing genetic diversity in agricultural commodity crops through its pre-breeding work. CGIAR argued that, by providing new breeding lines for private breeders to use in

new crop varieties, they were extending the genetic diversity of commercial crops.

Box 5.1 Plant Breeders' Rights

Plant Breeders' Rights (PBR) are a form of intellectual property (IP) protection for plant varieties, defined under the UPOV Convention (see Chapter Two, section 2.7.2). Plant varieties that can be protected under UPOV must be "(i) new, (ii) distinct, (iii) uniform, (iv) stable ..." (UPOV, 2017).

'New' is defined as not previously commercially available (rather than not previously existing); 'distinct' means distinguishable from other varieties; stable means it maintains its characteristics after repeated propagation (Dutfield, 2011 p.8).

PBRs grant "...breeders exclusive rights on propagating material (such as seeds) of new plant varieties that they have developed." (Dutfield, 2011 p.4). UPOV allows for some exceptions to PBRs, to enable the use of PGR for research, breeding and propagation by farmers in their own fields. However, UPOV has been criticised for favouring commercial crop breeding and undermining informal seed systems:

"This orientation towards industrial breeding is most clearly epitomised in the requirement that registration of a plant breeders' right will only be granted if a variety is new, distinct, uniform and stable (NDUS). ...These criteria encourage genetic homogeneity and cannot be used to protect more diverse plant varieties, traditional varieties or cultivated land races." (African Centre for Biosafety, 2015, p.5)

Traditional varieties, shared in informal seed systems, are unlikely to meet PBR standards. The introduction of PBR legislation into a country may therefore undermine local seed systems and consequently traditional farming systems. When farmers have to buy commercially produced seeds rather than swapping seeds with neighbouring farmers working in similar agro-ecological environments, it increases their costs and reduces the genetic diversity of crops in their fields (De Schutter, 2009).

5.2.3.1. Relations with the private sector

In the 1980s, CGIAR had to consider its relations with private sector actors, and its responsibilities as a public sector body, as Plant Breeders Rights (PBR) legislation expanded into countries in which CGIAR worked (see box 5.1). This legislation, alongside technological developments (i.e. the rise of biotechnology), enabled limited monopoly rights to breeders of new seed varieties, and supported the growth of private sector involvement in crop development.

In 1980, CGIAR members requested TAC to examine the impact of PBR legislation on CGIAR's work. The report of the 24th meeting of TAC (CGIAR TAC, 1980b) outlined concerns of some CGIAR Centres that PBR legislation in LICs had "...contributed to the take over of seed companies by large multinational corporations..." (ibid p.64) and that this had "...encouraged

excessive exploitation of the new technologies for profit and sale...” to the detriment of resource-poor farmers (ibid p.65).

Some Centres were also concerned about how PBR legislation might affect their work. In particular, Centres considered that PBR legislation might reduce their access to new seed varieties produced by private actors, and might limit their control over varieties they developed collaboratively with others.

TAC agreed to examine these issues and convened a panel of experts, chosen “...so as to represent the main groups of opinions and plant breeders' rights schemes (UPOV, US, etc.) which prevail in this field...” (ibid p.66). This choice automatically bounded the problem in terms of plant breeders' rights, not farmers' rights, and excluded actors (e.g. NGOs) opposed to the UPOV approach to plant variety protection.

Concurrently, IBPGR commissioned a consultant to examine these same issues and this consultant's report fed into the TAC process.

The IBPGR consultant's report (Aburg, 1981) listed several reasons why public sector breeders were wary of the expansion of PBR:

- PBR enables commercial breeders to limit exchange of material and related information
- If PBR restricted free exchange of germplasm, it could reduce opportunities for future technology developments.
- Focus on markets could reduce breeding programmes for minor crops
- PBR could strengthen monopoly interests of multinational seed companies
- PBR could facilitate the exploitation of developing country resources by multinational companies.

Nonetheless, Aburg took the position that public sector funding should be directed to “...basic research in plant breeding...” while “...breeding for practical purposes...” should rely on the income from royalties granted by PBR (ibid p.23). He therefore favoured the prevailing division of labour between public and private sector actors. He argued that the public sector should take responsibility for activities such as conservation and pre-breeding, because these did not provide direct financial benefit to private sector actors:

“Genetic conservation, in a broad sense, cannot be the responsibility of commercially interested breeders...” (ibid p.13)

Aburg concluded that private plant breeders could not be expected to take responsibility for the collection and conservation of germplasm, despite benefitting from such work. He argued

that this should be the role of the public sector. Additionally, genebanks should be linked more closely to breeders i.e. he reinforced the narrative that collection and conservation was of value only insofar as it might contribute to future plant breeding.

That paper was discussed by TAC in March 1981 (CGIAR TAC, 1981a), when it was decided to begin a process of drawing up a policy position on PBR. This limited, internal process included employing more consultants, holding a workshop in January 1982 (CGIAR TAC, 1982a), and starting a dialogue with UPOV (CGIAR CDC, 1981).

Over these different processes, elements of the debate emerged:

- PBR were considered necessary for private sector investment in plant breeding (CGIAR TAC, 1982c). This was the primary purpose of national PBR legislation, rather than quality control of benefit to farmers;
- PBR were intended to protect breeders' rights and different legislation was needed to protect farmers' rights and interests; and
- "PBRs of themselves were unlikely to have any benefit for development unless they were associated with national legislation covering the development and release of varieties and the certification of seed." (CGIAR TAC, 1981b, p.73)

Despite these concerns that PBR provided benefits to private sector actors rather than public sector researchers or resource-poor farmers in LICs, CGIAR chose not to challenge their spread. Instead, CGIAR positioned itself as providing a scientifically important, and politically neutral, international public plant breeding programme, with the objective "...to promote the widest use of this improved material for the benefit of all developing countries." (CGIAR TAC, 1982a, pp.3–4) In taking this position, it chose to ignore the political and financial barriers that might limit access to improved materials by resource-poor farmers who might benefit from it.

The debate illustrated that, to continue its public plant breeding role, CGIAR had to negotiate with other actors, particularly the private sector. In the new regulatory environment, CGIAR Centres had to decide on the terms under which to make their research outputs available to others. They could no longer just produce technologies, but had to engage with issues of ownership, access and the end use of their products. However, by claiming scientific neutrality, they side-stepped such concerns and continued to act within a framing of agricultural development that privileged the expansion of industrial agriculture crops.

The policy position that resulted from these processes recommended keeping an "...open-door policy..." (CGIAR TAC, 1982d, p.38) regarding giving out genetic material; not seeking "...exclusive rights..." on IARC improved seeds; protecting against appropriation by publishing

information; imposing conditions on, and seeking assurances from, government and private sector partners regarding exclusive rights, and working to minimise barriers to the free exchange of PGR between countries.

Following the 1982 policy decision, PBR issues remained a topic of concern within CGIAR, alongside the implications of increasing use of biotechnology in plant breeding and the related extension of other forms of intellectual property rights (e.g. patents) (CGIAR CDC, 1985).

A TAC-commissioned review of IBPGR (CGIAR TAC, 1986) included an examination of the relationship between public and private plant breeding work. Once again, CGIAR's role in pre-breeding was highlighted:

“Most plant breeders, certainly those working for private companies, are under continuous pressure to produce new varieties. Use of unimproved genebank material lengthens the breeding cycle and this is the reason why most plant breeders use it only as a last resort. Continuous and routine use of new germplasm will only be realized if the gap between genetic collections and breeding population is bridged by some pre-breeding activities. Realizing such programs should be the concern of each genebank and therefore also of the IBPGR.” (CGIAR TAC, 1986, p.22)

This reinforced the positioning of CGIAR's work as providing a service to the private sector. The justification for funding genebanks can be understood, in this framing, to rest on the usefulness of the genebanks to the commercial production of seeds. The review did not expect CGIAR researchers to produce technologies for use by farmers, but expected them to undertake pre-breeding work to produce materials from which the private sector could produce commercialisable technologies.

5.2.3.2. The FAO International Undertaking (IU)

During the late 1980s, discussions on PGR issues at TAC and Centre Directors' Committee (CDC) meetings focused on the impact of FAO's proposals for the international management of genetic resources.

The International Undertaking on Plant Genetic Resources (IU) was agreed at the 22nd session of the FAO Conference, November 1983. It stated:

“The objective of this Undertaking is to ensure that plant genetic resources of economic and/or social interest, particularly for agriculture, will be explored, preserved, evaluated and made available for plant breeding and scientific purposes. This Undertaking is based on the universally accepted principle that plant genetic resources are a heritage of mankind and consequently should be available without restriction.” (FAO, 1983a)

In line with CGIAR's founding framings, the IU was based on the premise that “...progress in plant breeding is essential to the present and future development of agriculture...” (ibid) but

that the skills and facilities for such programmes were not available in the countries in which relevant PGR were found. Therefore, international cooperation was needed to ensure the required work could be done.

The terms of exchange were also laid down: PGR was to be made available free of charge

“...where the resources have been requested for the purposes of scientific research, plant breeding or genetic resource conservation.” (ibid)

The framing of the IU therefore reinforced the prior understanding of the relationship between scientific research and agricultural development, and the relationship between PGR conservation and its use in crop development. However, none of the terms were defined, leading to future debate about which PGR were covered and what ‘without restriction’ implied.

The FAO’s Commission on PGR was also established in 1983, as an inter-governmental body to monitor the actions called for in the IU. TAC acknowledged that this new body was a response to CGIAR’s status as a donors’ club, which meant that “...many governments felt that they were not adequately involved in the present IBPGR network...” (TAC Secretariat, 1984b, p.51), particularly countries in the global South, in which many valuable PGRs could be found.

Because of these changes in the way in which PGR were to be managed at the global level, discussion within CGIAR was focused on where CGIAR’s work would sit in the new international arrangements, and what impact these systems would have on Centres’ work. TAC sought to frame the passing of the IU as complementary to CGIAR’s work “...through the provision of an international legal framework...” (TAC Secretariat, 1984c, p.9), within which CGIAR would operate, and set out its position on the delineation of roles between the two organisations. The chair of IBPGR suggested that “...the Commission would be concerned with political aspects, while IBPGR would continue to be concerned with the technical aspects.” (TAC Secretariat, 1984c, p.11). CGIAR was therefore claiming its role had no political dimensions, and proposed assigning responsibility for political issues to FAO.

The IU (Article 7.1(a)) called for the development of an international network of genebanks “...under the auspices or the jurisdiction of FAO...” (FAO, 1983a). However, Centre directors considered their collections to fall under the jurisdiction of the country in which the genebank was located (TAC Secretariat, 1984a). This led to a process of extended negotiation between CGIAR and FAO over ownership of the collections, centering on ownership between national governments, CGIAR and/or FAO. These negotiations were not resolved until 1994 (see section

5.3.1.4 below), and consequently informed policy development on the management of PGR at Centre and System level throughout the 1980s (e.g. CGIAR CDC, 1985).

5.2.3.3. National and international collections

As well as examining relations with private sector actors (section 5.2.3.1) the 1986 review of IBPGR (CGIAR TAC, 1986) also considered the relationship between national and international PGR collections. The review recommended that IBPGR retain free access to, and flow of, materials under its purview. To do this, the review recommended that IBPGR put terms on the conditions for PGR management such that, if a country asked IBPGR to store PGR, it would do so only on the condition that there would be free international access to it. The review therefore recommended that IBPGR, a supposedly apolitical technical organisation, dictate terms to national governments. It also interpreted the value of national collections in the context of their international use. In a framing in which new seed development is internationalised, the resources on which such development rests should be internationally available.

However, the relationship between national ownership of biodiversity and international use of it was highly contentious, and the status of germplasm collections managed by IBPGR and held by individual Centres was unclear. This was exacerbated by CGIAR's informal status and lack of member countries from the global South.

The 1986 review of IBPGR acknowledged that CGIAR's informal status was a potential hindrance to the free flow of germplasm.

“[It], however, conceals a deeper and more political issue: that IBPGR is a technical organization, politically answerable only in indirect ways, e.g, through the scientific community, through the participating international organizations and through the political processes of nations involved as donors or participants. As genetic material conservation has... become a much more public and political issue, the lack of more direct channels of political responsibility and participation has contributed to a reaction against IBPGR.” (CGIAR TAC, 1986, p.67)

This was a first recognition by CGIAR of concerns expressed by external actors (e.g. Mooney, 1983) about accountability and transparency. CGIAR's status as a 'donors' club', with limited membership, did not sit well with the role it was claiming for itself as curator of global PGR.

However, instead of considering actions to improve accountability, such as expanding CGIAR's membership, the review argued that the FAO Commission would provide the necessary “...channels of political responsibility...” (CGIAR TAC, 1986, p.68) and stressed the delineation between technical and political responsibilities. It used this as an argument for CGIAR working

at an international level rather than taking on activities which would require engagement with national level politics:

“...there are some tasks – such as *in situ* conservation – which are extremely important, but which require a much more political and governmental approach than the technical tasks at which the IBPGR excels.” (CGIAR TAC, 1986, p.68)

Thus, *in situ* conservation work was excluded from CGIAR’s mandate, not on the basis of whether or not it would improve the quality of PGR conservation efforts, but because it was considered to be ‘political’ and therefore FAO’s responsibility.

A further outcome of the review of IBPGR was a call from TAC for Centres’ global crop mandates¹¹ to be extended beyond plant breeding, to include

“...collecting, characterizing, preserving, and making available germ plasm for that crop and its wild relatives.” (CGIAR Committee on the IBPGR, 1985, p.2).

Such an extension recognised CGIAR’s responsibilities to act beyond its own interests in crop development.

In 1986, TAC established a working group to draw up System-wide policy on PGR. After two years of internal discussion, policy was agreed in 1988. This set the boundaries of CGIAR’s PGR work, stating a focus on crop plants, and excluding *in situ* conservation.

The purpose of CGIAR’s work was stated as being

“...to ensure that the diversity of germplasm is safely maintained and made available for use in programmes of research and crop improvement for the long-term benefit of all people.” (CGIAR TAC, 1988, p.2).

It is notable that the words ‘farm’ or ‘farmers’ do not appear in the document, nor any reference to poverty or biodiversity. While reference to ‘all people’ and ‘plant breeders’ can be understood to include farmers, nonetheless, the lack of explicit reference to them indicates that policy was primarily focused on the perceived needs of researchers and breeders.

The issue of ownership featured heavily in the policy, reflecting discussions with FAO about CGIAR’s role holding PGR ‘in trust’ for the international community (see section 5.2.3.2). The

¹¹The term ‘CGIAR mandate crops’ referred to 22 crops which were the subject of the 1994 agreement between FAO and CGIAR placing CGIAR genebank collections under the auspices of FAO. It is not clear how the 22 crops were decided and whether there is an authoritative list. (CGIAR Committee on the IBPGR, 1985, p.7) lists the crops Centres worked on: cassava, forages, bread wheat, durum wheat, triticale, barley, maize, potato, sweet potato, chickpea, faba, lentils, sorghum, pearl millet, minor millets, pigeonpea, groundnut, Bambara groundnut, cowpea, rice, yam, soyabean. Different lists were presented in later documents. For further discussion of ‘mandate crops’, see Appendix Four.

policy was internally conflicted, stating the importance of working with “national authorities” for “exploration and collection” but stating

“It is the CGIAR policy that collections assembled as a result of international collaboration should not become the property of any single nation.” (ibid p.3)

This seems to imply that national authorities were expected to allow collection of biodiversity but not claim any ownership rights on the collected materials. It expresses CGIAR’s framing of the value of PGR deriving solely from their international relevance.

Following agreement of the policy in 1988, the Inter-Centre Working Group on PGR was established. This group dealt with internal technical issues, such as ownership of the collections, which were under different arrangements for different Centres, according to the legal arrangements with their host country; funding; relations with FAO; and CGIAR policy positions e.g. in relation to PBR.

5.2.3.4. Critiques of CGIAR’s approach to PGR management

Within CGIAR, a clear narrative about the centrality of PGR collection and conservation to its plant breeding research work had developed by the early 1980s. But NGOs, academics and some internal voices were already questioning CGIAR’s approach to PGR management in the light of its status as a publicly-funded body. For instance, activist Pat Mooney (working within a coalition of development NGOs) argued that the spread of Green Revolution seeds was causing the loss of biodiversity in farmers’ fields. His book ‘Seeds of the Earth’ (Mooney, 1979) accused multinational seed companies of trying to gain exclusive control over PGR, and of shaping research and breeding priorities to fit their interests. This, and a later book (Mooney, 1983) triggered contestation between seed industry actors, government representatives of LICs, and international bodies such as FAO. He also argued that CGIAR’s role in managing genebanks and enabling ‘free exchange’ of PGR facilitated the transfer of seeds from their countries of origin, primarily in the global South, to research centres, primarily in industrialised countries (GRAIN, 1993).

These debates informed negotiations on the Convention on Biological Diversity (CBD) and subsequent negotiations over seed ownership and control. CGIAR engaged directly with Mooney and other NGO critics in the Keystone Dialogues (1988 – 91) discussed below (section 5.3.1.1).

Similarly, Oasa (1987, p.39) questioned whether there was a contradiction between IBPGR’s interest in preserving genetic diversity and CGIAR’s wider interest in participating in the

development of new technologies such as biotechnology. He raised questions about who would benefit from such use of genetic resources.

“Whether or not the two interests are contradictory will depend on the political character and content of hi-tech activity.”

Oasa argued that private sector actors would only be willing to invest in scientific research that would produce technologies that they could make money from. He also argued that public sector work in pre-breeding served private sector interests, leaving commercial actors free to invest in “...genetic innovations...that will expand their markets.” (ibid, p.52)

Internal reports also questioned the core focus of CGIAR’s work. Janvry and Dethier (1985), in an internal study paper, questioned the impact of CGIAR’s crop research and concluded that it had not been effective in meeting the needs of resource-poor farmers.

“While fundamentally oriented toward research on staple food crops, these centers have been more effective in addressing the problems of global food supply than the problems of who produces food and thus who derives an income from this activity.” (ibid p.79)

They highlighted the ability of more powerful actors in the food system to set the direction of research and therefore of technological development. To counter this, they called for more collaboration between

“...natural and social scientists and a greater participation of research beneficiaries (and affected sectors) in the definition of research priorities.” (ibid p.81)

5.2.4. Conclusion: CGIAR’s founding narratives and actors

The preceding description of CGIAR’s establishment has presented key elements of its founding narratives regarding agricultural research for crop breeding. It has laid out how those narratives shaped initial policy decisions on PGR management.

CGIAR’s founding role was predicated on an assumption of the need for, and relevance of, internationally applicable agricultural science. i.e. science that was relevant for agricultural development regardless of local political, social or environmental contexts. CGIAR presented its role as providing apolitical technical knowledge and scientific research. In relation to research on new crop varieties, CGIAR’s narrative stressed that its access to PGR from many countries was vital to its development of new crop varieties; these in turn are vital to increase agricultural production and productivity, particularly in LICs; and CGIAR’s research should support the development of new varieties by commercial actors.

This narrative was upheld by CGIAR members (a self-selecting group of foundations, governments and international organisations), by TAC and by many scientists in CGIAR Centres.

However, some internal and external voices presented alternative narratives, asking questions about the social and environmental impacts of agricultural development models within which new crop varieties were developed and used. These included some scientists in Centres working on NRM, civil society actors and some donors.

Those voices called for CGIAR to focus its research explicitly on the needs of poor farmers in LICs. However, TAC chose not to recognise the political implications of its choices about its research directions, such as supporting plant breeders' rights. Instead, TAC stated that political decisions were the remit of FAO. By framing technical and political policy processes as separate, it side-stepped questions about its legitimacy to make decisions about the use and management of PGR derived from countries not represented in its membership. It further protected its institutional interests by presenting its research as central to future developments, such as FAO's proposed international network of genebanks.

5.3. 1990 – 1995

The previous section of this chapter set out CGIAR's founding framings regarding its role in PGR management and crop development, and the relationship of that work to agricultural development approaches. The thesis' case study starts in 1990, and this section of the chapter charts internal and external pressures shaping CGIAR's policy decisions relating to the use and management of PGR from 1990 to 1995. CGIAR's approach was challenged by new international regulatory frameworks affecting PGR management (the CBD and agreements with FAO) and by financial crises arising from donors reducing core funding (CGIAR CDC, 1991). This section of the chapter examines some of those issues and CGIAR's responses to the challenges it faced.

5.3.1. External events affecting CGIAR's PGR work

Between 1990 and 1995, developments in the international governance of PGR influenced CGIAR's research agenda, and shaped its policy decisions regarding its use and management of PGR. The relevant processes are explained below.

5.3.1.1. Keystone Dialogues 1991

The Keystone Dialogues (Keystone Center, 1991) ran from 1988-91 and brought together relevant industry, international and public interest groups to try to identify common ground in relation to issues of PGR and intellectual property (IP) (GRAIN, 1991; 14). The dialogue process was seen by many, particularly NGOs, as valuable for enabling constructive discussion about biodiversity conservation between actors with starkly different perspectives. It highlighted

both the limitations of the genebank system (i.e. the quality of conservation) and the important role played by farmers and NGOs in the conservation and development of PGR. Its 'Final Consensus Report' (Keystone Center, 1991) called for urgent international action to address PGR losses and proposed the establishment of a "...global initiative for the security and sustainable use of plant genetic resources." (ibid p.v) It called for the involvement of informal sector representatives in decision-making processes and for recognition of, and recompense for, their role in biodiversity conservation (GRAIN, 1991). However, it reported that no agreement had been reached on IP issues. The final report was submitted as a contribution to the United Nations Conference on Environment and Development (UNCED) in June 1992, at which the CBD was to be agreed.

The Keystone Dialogues were influential in putting issues of Farmers' Rights onto the international agenda, and highlighting the role of non-government actors in PGR conservation. As a result, CGIAR came under pressure from donors to engage with diverse stakeholder groups and to consider the relationship between crop development and natural resource management (NRM).

5.3.1.2. United Nations Conference on Environment and Development (UNCED) 1992

UNCED 1992, also known as the Earth Summit, aimed to address concerns about environmental degradation, and to promote actions to achieve sustainable development. It produced the Rio Declaration on Environment and Development, Agenda 21, a statement of principles for forest conservation, the CBD and the UN Framework Convention on Climate Change (Parson et al., 1992).

5.3.1.3. Convention on Biological Diversity (CBD) 1993

The CBD, agreed at UNCED 1992, entered into force in 1993. As described in Chapter Two (section 2.7.2), it redefined concepts governing international use and ownership of PGR. Where the 1983 FAO International Undertaking (IU) had defined PGR as "...a heritage of mankind..." which should be "...available without restriction..." (FAO, 1983b), the CBD gave nation states "...sovereign rights over their own biological resources." (UN, 1992) This challenged the previously accepted approach of international ownership of PGR, under which most of the PGR held in CGIAR genebanks had been collected. As a result of the changed approach to PGR ownership and exchange arising from the CBD, CGIAR had to develop new policies for its management of its genebank collections.

The CBD linked access to PGR with sharing the benefits from research or commercialisation arising from the use of the PGR provided. However, the terms of, and mechanisms for, access and benefit-sharing were the subject of extensive negotiation, which were eventually agreed in the Nagoya Protocol (2014). The CBD additionally recognised, and called on signatories to protect, Traditional Knowledge associated with PGR.

Several 'outstanding issues' were identified in the CBD. These included the treatment of *ex situ* collections created prior to the coming into force of the CBD and Farmers' Rights. Both these were to be dealt with through the FAO process of renegotiating the International Undertaking (IU).

5.3.1.4. FAO-CGIAR agreements 1994

The 1983 FAO International Undertaking on PGR had proposed that PGR held in international genebanks i.e. by CGIAR Centres, should come 'under the auspices' of FAO. Negotiations between FAO and CGIAR on this issue concluded in 1994, with each Centre signing an individual, but identical, agreement with FAO. In doing so, Centres agreed to recognise "...the intergovernmental authority of FAO..." with respect to setting policies for genebank management, and agreed to consult with FAO on any relevant policy changes (CGIAR Secretariat, 1994b, p.3).

CGIAR saw the CGIAR-FAO agreements as a means to reinforce the existing multilateral approach to PGR access and exchange. They were therefore a response to the CBD, which encouraged bilateral arrangements (CGIAR Secretariat, 1994b).

5.3.1.5. TRIPS (Agreement on Trade-Related Aspects of Intellectual Property Rights), 1994

Under the 1994 TRIPS Agreement of the WTO, the scope of IP provisions were, for the first time, extended to include the agriculture sector. Although TRIPS (under Article 27.3(b)) allows for exclusions from patenting for "...plants and animals other than micro-organisms..." (WTO, 2020) it also states that signatory countries have to put in place "...some form of legal property protection for genetic material." (CGIAR TAC, 1994, p.iii)

Countries joining the WTO were put under pressure to adopt UPOV 1991 rules, which reduced farmers' rights to share and propagate protected seed varieties compared to the 1978 UPOV rules (GRAIN, 1996).

TAC noted that “This emphasizes the monetary value of such resources.” (CGIAR TAC, 1994, p.iii) and “...changes the context of the germplasm accessions held by the CGIAR System.” (ibid p.13) This is discussed in section 5.3.3 below.

CGIAR responded to those changes in the global regulatory framework affecting PGR by trying to consolidate its position as a holder of PGR, and put itself at the centre of new developments. Some of its processes, and the new policies and research priorities it developed, are examined below.

5.3.2. PGR governance debates

Throughout the 1980s, donor interest in sustainability and environmental issues increased. In response, TAC presented an expanded vision of CGIAR’s research at the 1990 annual meeting. It described research under two headings: “global commodity activities and ecoregional activities.” (CGIAR Secretariat, 1990, p.3)

TAC described ecoregional activities as incorporating “...research on the ecological foundations of sustainable production systems...” (ibid) and envisaged working with national partners on such programmes. Global level work would encompass not only commodity-focused research but also issues such as “...policy, management, conservation of germplasm and the maintenance of biodiversity.” (ibid)

On that basis, CGIAR members decided to include “...natural resource management as a twin pillar of CGIAR-supported research. The other pillar would continue to be productivity.” (ibid p.5) This represented an expansion of CGIAR’s mandate beyond crop productivity to incorporate some environmental concerns of interest to donors.

UNCED 1992 further increased global attention on sustainability issues. CGIAR responded by expanding its conservation research into new areas: *in situ* conservation and conservation of trees, fish and livestock.

In anticipation of changing global frameworks for PGR expected to emerge from UNCED 1992, TAC examined CGIAR’s work on PGR in 1991. It produced a paper on System-wide issues relevant to PGR management (CGIAR TAC, 1991). The paper identified several issues of concern. These included CGIAR’s role in relation to the global conservation strategy proposed by FAO; CGIAR’s role in relation to non genebank approaches to conservation; how Centres should work together on problems relevant to several crops; and ownership and security of genebank collections. The paper’s authors acknowledged that issues of use and ownership of

PGR were increasingly political, and expressed concern about the nature of CGIAR's future role in any global conservation system that supported the development of national genebanks.

The paper reiterated earlier positions that approaches to conservation had to facilitate access to PGR by researchers. In that context, characterisation and documentation were important parts of the work of genebanks. The paper acknowledged that, if conservation was not for its own sake, but was linked to use, criteria would be needed to decide what should be conserved, how much and in what form. The paper did not ask who decides what is considered useful, instead implying that such decisions would be based on technical and funding considerations. Despite recognising the political nature of questions of PGR use and conservation, TAC did not address them, instead considering such policy decisions to be the remit of FAO. However, TAC did recognise a need for consensus on the "...sociological, legal and political aspects that are involved..." (ibid p.6) without elaborating on what they were, or how consensus would be reached.

The paper set out TAC's position regarding CGIAR's role in a changing global system. It concluded that CGIAR should maintain its focus on *ex situ* conservation, and argued that Centres should expand that work beyond the mandate crops. It acknowledged the need for CGIAR to engage with an increasing number of other stakeholders including national governments. In that context, TAC's position was one of trying to ensure that CGIAR retained control over the genebanks under its auspices, and retained a central position in the developing global system, while maintaining its technical role in PGR management and not engaging with national political issues.

Nonetheless, TAC acknowledged the need for CGIAR to engage more actively in international political fora, such as UNCED, in order to influence their outcomes (CGIAR Secretariat, 1991c). It recognised that to do this, CGIAR would have to present a united position across all the Centres on relevant issues. This need strengthened internal pressure (particularly from the large commodity Centres) towards a System-wide approach to PGR management and to policy positions on PGR and IPR. This position also marked a move away from TAC's previous position that CGIAR was an apolitical organisation.

5.3.2.1. Ownership of PGR collections

In the run up to UNCED 1992, TAC commissioned legal experts to clarify the status of PGR collections held in Centre-run genebanks (Siebeck and Barton, 1991). TAC and CGIAR members considered this a necessary step prior to negotiations with FAO and others over any new international arrangement.

The legal experts recommended that the PGR collections should not be considered as assets belonging to the Centres, but instead Centres should be considered as “...custodians or trustees of their germplasm collections.” (Siebeck and Barton, 1991, p.iv) This would mean that, if the Centre closed down for any reason, the collections would be taken over by some other international body and would not become the property of the country in which the genebank was located. This notion of trusteeship for the international community was not only a restatement of past positions but was also seen by TAC and CGIAR members as a necessary counter-balance to calls for national sovereignty over PGR arising from the CBD process.

However, the legal experts then raised the question of how ‘trusteeship’ should be defined, and who were the beneficiaries of the trust.

“To clearly identify the beneficiary of the trust is important. While CGIAR Policy documents variously refer to humanity, all people, and present and future generations of research workers in all countries throughout the worlds as benefitting from the centers’ germplasm collection efforts, the purpose of the establishment of the CGIAR in order to meet the food needs of the developing countries suggests that these countries should be [p.v] considered the primary beneficiaries also of the collection effort. ...We also anticipate that only if the developing countries are clearly seen as the beneficiaries of the centers’ genebank collections, will they be willing to allow continued free access to their germplasm resources.” (Siebeck and Barton, 1991, pp.iv–v)

This attempt to define ‘trusteeship’ and identify the beneficiaries of CGIAR’s work coupled ethical and legal concerns with practical and political considerations. It raised the notion that trusteeship holds within it a duty to look after the interests of the beneficiary, but highlighted the lack of clarity regarding who the beneficiaries were. The report’s authors considered the beneficiaries should be ‘developing countries’, in part for political reasons, anticipating negotiations at UNCED. However, they did not consider whether CGIAR’s research should target specific groups within those countries e.g. farmers, researchers, poor people, indigenous populations.

This was the first time that the question was raised within CGIAR about who benefits from CGIAR’s crop development work and from it holding PGR ‘in trust’. However, the report’s authors merely highlighted that it was an important issue for CGIAR to consider, without providing any answers.

5.3.2.2. Implications of the CBD

The CBD did not clarify the status of CGIAR’s germplasm collections. Instead, their treatment was one of the ‘outstanding issues’ in the CBD about which decisions still had to be made. The *ex situ* collections created prior to the coming into force of the CBD contained germplasm for

which information on country of origin might not be available, and therefore could not be the property of any particular country. However, the Centre holding such germplasm could not claim ownership because it had been collected on the understanding that it was collectively owned as ‘common heritage of mankind’. Placing the collections formally under the auspices of FAO was seen as a solution to this problem, because FAO was a recognised international body under the UN, unlike CGIAR which did not have any legal identity. These developments highlighted national sovereignty issues and the rights of other actors, such as farmers and national bodies, over PGR which had until that point been held by CGIAR and which it had been able to manage as it saw fit.

CGIAR also acknowledged the need to develop strategies to manage external change and uncertainty (IBPGR, 1993). On a practical level, it had to find an organisational arrangement to manage new requirements on its handling of PGR, and its work in relation to wider global conservation concerns. While Centres took on “...full responsibility for the collecting, conservation and documentation of their respective mandate species...” (IBPGR, 1992, p.1) this left gaps in relation to non-mandated crops, and in relation to research that was relevant for more than one crop. The Centres had to agree roles and responsibilities between themselves, with IBPGR, with FAO and with NARS. The practical implications of the changing status of collections, as they came under the auspices of FAO, and had to be managed in line with CBD requirements, were major concerns for the Centres during this time.

As noted above (section 5.3.1.4), FAO and CGIAR Centres signed agreements in 1994 placing CGIAR’s genebanks ‘under the auspices’ of FAO. However, several issues about their use and management remained outstanding. These included clarification of “...the concept of the trusteeship of plant genetic resources...in particular as it related to the concept of ownership...” and the meaning of the word ‘beneficiary’ (FAO, 1993, p.15).

In addition, because the agreements were between each individual CGIAR Centre and FAO, rather than at System level, each Centre was able to ‘designate’ (i.e. choose) what PGR to include in the agreement. Only designated PGR was subject to restrictions on taking out IP protection, which were supposed to ensure PGR remained in the public domain. The situation was further complicated by the fact that there were overlaps between collections held by different Centres and sometimes poor record keeping. Therefore, germplasm could be designated by one Centre but excluded from the list of designated germplasm by another. This led to a lack of clarity over which crops came under the auspices of the CGIAR-FAO agreements and meant that the products of CGIAR research were not necessarily subject to the FAO agreements.

During negotiations between FAO and CGIAR Centres, the status of PGR of different types held in the collections had to be agreed. The debate centred on different elements of the collections (see Box 5.2), how they were used and how their ownership was understood i.e. what CGIAR could claim to own and what Centres had to place in the public domain.

These different forms of germplasm, held and used in different ways, were understood by the Centres to have different value and different ownership characteristics. For all the Centres' rhetoric about ensuring that germplasm was freely available, they felt the need for working collections to be managed so as to enable their own research to go ahead without others automatically having access to the materials on which they were working.

The shift in the role of genebanks and the material in them from being a resource to support research (CGIAR's and more widely) to being a resource of value in itself, both economic and as a public good, created debate about what sort of genetic resources belonged to which bodies, and for what uses. Thus, discussion about the difference between base, active and working collections was not just about the most effective way of ensuring the conservation of PGR needed for plant breeding, but also had a financial element to it, because of the potential to take out IPR on some forms of germplasm. Similarly, while debates

<i>Box 5.2 Categories of PGR</i>	
Category	Definition
Base collection	Long term storage, not normally distributed or exchanged. "Material in base collections is supplied only in emergencies to replace accessions inadvertently lost from active collections." (CGIAR TAC, 1988, p.3)
Active collection	Medium-term storage, with larger quantities of seed, for distributing and for use in crop development.
Working collection	Seeds on which researchers are working, and therefore are stored in much shorter-term conditions. These are "...not regarded necessarily as part of the coordinated international effort on plant genetic resources..." (CGIAR, 1988 p.2) though they are often shared with NARS and other collaborators.

about IP (see section 5.3.3) were couched in terms of maintaining free access to PGR, there was an undercurrent of concern about the financial burden on Centres of managing genebanks and how they might be compensated for holding PGR 'in trust for the world community'. Therefore, debates about what forms of PGR fell under the concept of trusteeship, were as much about such practical details as about ethical issues.

5.3.2.3. 1994 Stripe Study of Genetic Resources

In 1994, TAC commissioned a Stripe Study of Genetic Resources, which was conducted by a multi-stakeholder panel, including NGO representation (CGIAR TAC, 1994). This study

examined CGIAR's policies and activities relating to genetic resources, and external factors affecting them including IP (see section 5.3.3).

The Stripe Study identified several implications of CBD and GATT 1994 for the management of the genebanks. These included the need to record, and draw up contracts for, the movement of germplasm, to comply with the CBD's requirements on access and benefit sharing (ABS) (ibid p.13) and the need to work closely with national governments over the management of germplasm. This was not just a practical consideration but also potentially affected CGIAR's mandate to work internationally. Under the CBD, nations could claim ownership of PGR and expected crop development programmes to be directed to their national needs. CGIAR could no longer unilaterally determine its PGR management strategies.

Similarly, compliance with CBD required information on the genetic resources held in CGIAR genebanks to be easily available. The Study therefore recommended the establishment of a "...standardized system of information management..." (ibid p.22) as part of a broader System-wide programme to manage PGR.

The approach of the Stripe Study was underpinned by an assumption that researchers' access to, and information about, PGR was an essential prerequisite for crop yield improvements and that such crop development programmes were themselves a prerequisite for countries to be able to address food security.

"A strong technological base for understanding and utilizing the genetic resources at hand is essential for combating hunger and malnutrition in the future." (ibid p.2)

This was a reiteration of CGIAR's founding narratives regarding a linear relationship between PGR conservation and future global food security; and of science-led policy making. Despite the state of flux of regulatory frameworks and policy contexts, and a recognition of political factors influencing the shape of new frameworks, CGIAR's dominant narrative about its own work remained unchanged.

Similarly, although the Study questioned the range of CGIAR's work, it did not recommend any significant change. It concluded that *in situ* work was not its mandate, because CGIAR did not operate at a national or local level. The Study examined CGIAR's actions (what it did), but did not examine deeper questions about its purpose (why it did them) or the value of its work in relation to its mandate to address hunger and poverty. Thus, it recommended supporting NARS in work on underutilised crops "...if additional funding becomes available..." (ibid p.23) while maintaining its focus on "...crops...which are economically important for developing

countries.” (ibid) Broader questions about which crops were economically important for which groups in society, or what economic model such an assessment assumed, were not addressed.

The Stripe Study recommendations enabled CGIAR to position itself as ensuring its work aligned with, and contributed to, moves to create a global conservation system. However, the Stripe Study was conducted at a time of financial crisis in CGIAR. This undoubtedly influenced the decision to frame CGIAR’s work on PGR as a coherent programme, which could be ‘sold’ to donors. In other words, CGIAR’s promotion of its germplasm collections as a contribution to a global conservation system arose in part as justification for seeking funding for this area of its work. The Stripe Study noted proposals from FAO and others for the establishment of a trust fund to ensure long-term funding for genebank work and called for CGIAR to “...support the establishment of the fund and seek its appropriate share.” (ibid p.33)

The proposals for a System-wide approach to PGR management also arose as a means to counter critiques of CGIAR’s work. TAC was aware that any claim to be protecting biodiversity would have to stand up to

“...the scrutiny of the new global environmentalists.” (CGIAR TAC, 1994, p.8).

However, external actors considered that CGIAR’s understanding of ‘sustainability’ was limited, with its focus on productivity increases reducing its capacity to integrate environmental conservation within its agricultural development

<i>Box 5.3 Changes in global regulatory and practice approaches to PGR to 1995</i>	
From	To
<ul style="list-style-type: none"> Free international access to PGR for researchers and breeders 	<ul style="list-style-type: none"> National sovereignty over PGR
<ul style="list-style-type: none"> PGR as a free resource 	<ul style="list-style-type: none"> PGR as a resource with potential economic value
<ul style="list-style-type: none"> Most crop research conducted by public sector 	<ul style="list-style-type: none"> Increasing levels of biotechnology-based crop research mostly conducted by private sector
<ul style="list-style-type: none"> Plant breeding methods and techniques widely accessible 	<ul style="list-style-type: none"> Plant breeding techniques, particularly for biotechnology, often proprietary

approach (GRAIN, 1994). GRAIN noted the continued separation between its NRM programmes and its crop development work. GRAIN also criticised CGIAR’s technology-focused approach to addressing poverty and argued that CGIAR’s financial crisis arose because donors shared GRAIN’s concerns.

The CBD and GATT created new global frameworks for PGR use and management. Alongside the rise of biotechnology and increased private sector involvement in IAR (see section 5.3.3), the CBD led to a significant shift in approaches to PGR use and ownership (see Box 5.3).

CGIAR responded by shifting its research approach and extending its role in several areas of PGR management, and those changes are summarised in Box 5.4. In addition, CGIAR changed its approach to global negotiation processes. It initially claimed a position as an apolitical body, standing aside from international negotiation processes. Following UNCED 1992, it began engaging actively with international negotiation processes to shape their outcomes in its interests (framed as the interests of the ‘international community’).

By 1995, CGIAR had established a Systemwide Genetic Resources Programme (SGRP) (Hawtin, 1994) and a Genetic Resources Policy Committee (GRPC). The former focused on programme coherence and the latter had the remit to develop system-wide policy on the management of genetic resources, and to formulate CGIAR’s positions regarding changing international frameworks governing genetic resources.

<i>Box 5.4 Changes in CGIAR's approach to PGR management</i>	
1990 position	1995 extensions
<ul style="list-style-type: none"> CGIAR sees PGR as having value as input to its breeding programmes 	<ul style="list-style-type: none"> Recognition of value of PGR for biodiversity (CGIAR Joint TAC-Center Directors Committee on Intellectual Property Rights and Plant Genetic Resources et al., 1992, p.7) Additionally, Centres provide germplasm to NARS for their own breeding programmes (CGIAR TAC, 1994)
<ul style="list-style-type: none"> Centres hold PGR for their own needs 	<ul style="list-style-type: none"> Centres hold PGR ‘in trust’ for use by all (not defined) Centres taking responsibility for protecting genetic diversity for their mandate crops (IBPGR, 1992)
<ul style="list-style-type: none"> Ownership not an issue because PGR is a ‘common heritage of mankind’ (CGIAR TAC, 1994) 	<ul style="list-style-type: none"> Ownership has to be clarified CGIAR acknowledgement of the political dimensions of debate over ownership Public ownership has to be defended (‘public’ not defined)
<ul style="list-style-type: none"> CGIAR Centres use resources for their own research 	<ul style="list-style-type: none"> CGIAR has a duty to make PGR available to other researchers, including undertaking characterisation work so that information about the contents of the genebanks is available to others
<ul style="list-style-type: none"> Centres maintain responsibility for collections for ‘mandate’ crops 	<ul style="list-style-type: none"> Alongside that responsibility, CGIAR begins to recognise importance of <i>in situ</i> conservation and need for conservation of forestry, marine resources and orphan crops
<ul style="list-style-type: none"> PGR conservation is a concern of plant scientists 	<ul style="list-style-type: none"> Acknowledgement by CGIAR that a wider range of stakeholders have valid interests
<ul style="list-style-type: none"> PGR conservation required at international level 	<ul style="list-style-type: none"> Recognition of need for CGIAR to support national, and nationally relevant, conservation (CGIAR TAC, 1994, p.5)
<ul style="list-style-type: none"> Centres operating genebanks independently of each other 	<ul style="list-style-type: none"> CGIAR recognising the need for coordination across an international system

5.3.3. Intellectual Property policy development: 1990 to 1995

Plant breeders had been able to apply a limited form of intellectual property protection on their varieties (plant breeders’ rights – see Box 5.1) since the 1960s. But in the late 1980s, with

the development of biotechnology, large-scale private seed companies started to take out patents on their new varieties, and on some of their production processes (CGIAR TAC, 1991). Policy debate within CGIAR focused on how to respond to this shift.

During the early 1990s, CGIAR internal stakeholders debated IP issues extensively in a range of committees, ad-hoc working groups and donor meetings. At least four sub-committees and task forces were engaged in developing policy on IP, biotechnology and PGR management (CGIAR GRPC, 1995). The period was characterised by draft papers going to and from the Centre Directors' Committee (CDC), TAC, donor meetings and back to CDC. Initially, biotechnology and IP issues were examined in separate working groups, but the inter-relationships between the issues quickly became apparent, and the groups joined together to consider issues of PGR, IPR, biotechnology and biosafety together.

CGIAR had agreed a policy position on PBR in 1982 (CGIAR TAC, 1982b). Discussion in TAC at that time had considered the potential future impact of the rise of biotechnology and related extension of IP into agricultural research, but the 1982 policy had not included any guidance on that issue. In 1991, in the context of the Keystone Dialogues, and preparation for UNCED, Centre Directors recognised the need for CGIAR to have a coherent policy on this issue (CGIAR CDC, 1991). They developed a draft policy on IP rights (IPR), which proposed that Centres would not take out patents or other forms of property protection on PGR for financial gain (CGIAR CDC, 1991). It also called on CGIAR to make a clear statement that Centres would not take out patents on genes. This draft policy was discussed by CGIAR members at the half-yearly meeting in October 1991. However, members were unable to reach agreement on endorsing the policy. Instead:

“After considerable discussion, the Group decided that the draft should be further discussed in the home capitals of delegates, and the results of those discussions conveyed to the CGIAR Secretariat.” (CGIAR Secretariat, 1991b, p.20).

This indicates that CGIAR members considered IPR to be a political issue because national representatives were unable to make a decision without consultation with their home authorities.

IPR was discussed again at the May 1992 mid-term meeting and two complementary papers were presented. The first (from the TAC-CD committee on IPR and PGR) presented a set of principles on which CGIAR's IPR policy should be based. These included:

- Holding PGR “...in trust for the world community...”
- Assuring free access to PGR (though without specifying for whom)
- Recognition of both PBR and farmers' rights (though without specifying how)

- Only seeking IP protection if “...it is absolutely necessary to ensure access by developing countries to new technologies and products.” (CGIAR Secretariat, 1992, p.22)
- Non-patenting of “...naturally occurring genes...” (CGIAR Joint TAC-Center Directors Committee on Intellectual Property Rights and Plant Genetic Resources et al., 1992, p.1)
- Protective patenting of own inventions if necessary
- Case-by-case consideration of the need to take out IP protection based on whether it was needed to enable collaboration with other research institutions and/or to enable “...product development and distribution...” (CGIAR Secretariat, 1992, p.22)
- Investment of any income from patents into PGR conservation and development
- Following agreed international guidelines and conventions where appropriate.

Although the paper sought to enable the development of a single position across CGIAR, decision-making power regarding when to take out IP protection remained with individual Centres.

The second paper was prepared by the TAC Secretariat (CGIAR Secretariat, 1992). This discussion paper highlighted the potentially positive role of IPR in increasing investment in biotechnology research, as well as the potential dangers of IPR in placing restrictions on access to the results of research. It distinguished between PGR and “research products”, and reaffirmed the principles outlined in the first paper (*ibid* p.2). It called for a “...guarantee of unrestricted access for the benefit of the world community...” for PGR, but, as with the Joint TAC-CD paper, did not define what it meant by “the world community” or access for whom (*ibid*). It recognised that unrestricted access to technologies developed by others was no longer guaranteed. It also recognised that “...the Centres’ genebank collections cannot be considered amongst the Centres’ assets.” This meant that any income from IPR could not accrue to Centres, and should instead be placed in “...an international fund...” to support conservation in LICs (*ibid*).

The paper stated that Centres should recognise patents held by others, or take out patents on their own research products only “...to ensure that the most beneficial advanced technologies and their products would be made available to developing nations at as low a cost as possible.” (*ibid* p.4). However, this paper did not contain any guidelines on how a Centre might identify those technologies which would be “most beneficial” or make any comment about who within developing nations might receive the technologies.

The paper also acknowledged global interest in PGR conservation “...as part of the wider concept of biodiversity.” (ibid p.7) i.e. beyond its relevance for future agricultural development.

In a further recognition that stakeholders beyond the research community had a valid interest in PGR management, the paper stated

“The plant genetic resources maintained in international base and active collections by the CGIAR Centres are held in trust for the world research and development communities.” (ibid p.8)

The addition of ‘development communities’ represents a major shift from earlier policy statements, which identified trusteeship only on behalf of researchers. Farmers, however, were still not explicitly mentioned.

The proposed principles were adopted as a ‘Working document on genetic resources and intellectual property’ (CGIAR Secretariat, 1992).

In 1993, CDC conducted a stakeholder consultation on IP issues, which confirmed agreement by stakeholders on the guiding principles outlined in the 1992 Working Document. CDC also prepared a paper presenting first suggestions for a policy for the management of in-trust germplasm, based on these guiding principles. The paper stressed that this policy would apply only to in-trust germplasm, and did not “...cover materials arising from breeding programs, processes, publications, software, machinery etc., for which other guiding principles are needed” (CGIAR CDC on IPR, 1993, p.3).

As seen already, CGIAR was therefore making a clear delineation between germplasm that it might make available to all, and germplasm and related products that was the basis of (or arose from) its own research.

The 1993 paper presented policies on IP developed at Centre level. These demonstrated varying degrees of engagement with the issue, from Centres that had no policy to those that had developed a position encompassing concerns not addressed by the suggested guiding principles. For instance, ICRISAT’s policy discussions considered “...equity and impact issues...” (ibid p.11) of making germplasm freely available to all. It questioned whether free distribution of germplasm to any researcher “...may not be as equitable as it seems on the surface.” It stated that

“Material will be made available for commercial use only when ICRISAT is confident that the interests of people of developing countries are properly safeguarded.” (ibid)

The ICRISAT policy therefore applied different terms of access to PGR for LIC government bodies, non-profit organisations, commercial actors and users in industrialised countries. It

allowed access only for research purposes for the latter two and required royalty payments for distribution licenses (ibid p.12). The policy therefore took into account, and tried to act to counter, technological and resource inequalities in the global crop development system.

Despite a level of internal agreement over the Suggested Guiding Principles, comments from external stakeholders demonstrated a high degree of antipathy to CGIAR's approach. NGO representatives stated that:

“...if Centers were to adopt intellectual property practices they would be seen to be endorsing a system which is taking away rights from farmers in favor of breeders.”
(ibid p.23)

A group of NARS felt that CGIAR should be promoting farmers' rights not IP; NGOs and FAO both questioned the distinction between in-trust germplasm and “research products”, and FAO called for clarification of CGIAR's right to make policy in relation to materials owned by the ‘world community’ without input from “...representatives of the world community...” (ibid p.26). Who these representatives might be, or how they might be identified was not clarified. There was also no discussion of how they might participate in decision-making i.e. mechanisms for their inclusion.

The CDC paper was discussed at the 1993 members' meeting, in panel discussions on IPR and PGR (CGIAR Secretariat, 1993). Despite the level of debate within CGIAR, and Centres' careful responses to complex changes in the environment within which they operated, positions put forward by different stakeholders in the panel were predictable and becoming entrenched.

These can be characterised as:

<i>Table 5.1 Stakeholder perspectives on IP</i>	
Representatives of the legal profession	<ul style="list-style-type: none"> • IP is a reality and CGIAR has to work out how to operate within the new environment; arguing for or against IP is irrelevant • IP is valuable and useful • IP can be a bargaining chip for Centres • Understanding IP issues is essential to developing partnerships with private sector actors <ul style="list-style-type: none"> ○ Partnerships are essential to gain access to proprietary technologies <ul style="list-style-type: none"> ▪ Access is essential because developing countries need technology to be transferred.
Private sector representatives	<ul style="list-style-type: none"> • IP is necessary for collaboration with the private sector • IP is necessary for technology transfer • No logical reason to oppose patenting of genes • Economic value of genes can only be identified through use of proprietary technology • Biotechnology is expensive and companies need IP protection to ensure returns on investments.

Representatives of developing country government	<ul style="list-style-type: none"> • CGIAR Centres give PGR out for free, but companies develop and patent products which developing country farmers then have to pay for • UPOV and TRIPS strengthen breeders' rights but do not protect farmers' rights • IP has value in innovation protection • Conflicting interests have to be balanced <ul style="list-style-type: none"> ○ Between free access and commercial interests ○ Between patent protection and conservation needs.
NGO representatives	<ul style="list-style-type: none"> • Patents on life should not be allowed, and are often not culturally appropriate • But patents can protect what belongs to farmers in the South, and can encourage <i>in situ</i> conservation • Farmers' rights are important • Patents always lead to exclusivity • Patents are unlikely to serve the interests of small-scale farmers • Technologies gained through transfer may not be of value to small-scale farmers • CGIAR should not protect research results through patenting, but through publishing to keep in the public domain

These discussions highlighted the wide range of positions held by CGIAR members and other stakeholders, and the alignment of actors' interests with the positions they presented.

They also informed the Stripe Study of Genetic Resources in 1994 (CGIAR TAC, 1994) discussed above (section 5.3.2). As part of its examination of CGIAR's policies and activities relating to genetic resources, the study considered how CGIAR should engage with IP issues. It stated:

“In order to respond on a day-to-day basis to IARCs' partners, the CGIAR System needs to develop a coherent and acceptable policy on intellectual property with regard to genetic resources upon which their breeding programmes depend.” (ibid p.7)

In this context, the Study considered it vital that CGIAR “...maintain trust with germplasm donors.” To do that, “...the System must consciously forego benefiting from the commercialization of germplasm.” (ibid p.14) This implies that the policy decision to limit Centres' opportunities to take out IP on their research products did not arise from a principled position, but from a balancing of interests regarding CGIAR's ability to continue to access PGR for its research programmes.

The Study also recommended that CGIAR support national governments to develop appropriate IP systems that enable them to uphold “...the rights of the germplasm donors...” when germplasm is given to “commercial users” (ibid p.15); and to develop *sui generis* plant variety protection laws that recognised and protected farmers' varieties. This recommendation presented CGIAR's role as providing technical support to national governments; it did not acknowledge the political dimensions of providing such advice.

IP issues were discussed again in 1995 as part of a larger process reviewing major issues affecting CGIAR (see section 5.3.4 below). An *ad hoc* IPR Panel was convened, which reviewed CGIAR's approach to IP in the light of new frameworks introduced under CBD and WTO. The panel endorsed the 1992 position paper on IP (CGIAR Joint TAC-Center Directors Committee on Intellectual Property Rights and Plant Genetic Resources et al., 1992) and elaborated on it, by describing three circumstances when it might be acceptable for Centres to take out patents on their research products:

- to "...prevent appropriation by others..." (CGIAR IPR Panel and Swaminathan, 1994, p.ii)
- to facilitate product development and dissemination
- and to "...use ownership of intellectual property to negotiate access to other proprietary technology for the benefit of developing countries." (ibid p.ii)

The last of these was an extension of the 1992 position.

The panel recognised the complexity of IP issues and recommended that CGIAR set up central technical and legal services to help Centres understand and apply relevant IP law.

While the Panel endorsed and reiterated existing policy positions on the use of IP, the report presented a new version of CGIAR's research priorities. It stated:

"The major aim of the CGIAR has been to protect and promote the interests of small and resource poor farming families in developing countries. CGIAR's new vision places the productivity, profitability, and stability of food-based farming systems in the developing countries on an environmentally sustainable and socially equitable basis as being of highest priority." (ibid p.1)

This significant reframing of CGIAR's work and role can be understood as part of the process of crafting the 'New CGIAR' in the run up to the Lucerne process (see section 5.3.4 below).

5.3.4. CGIAR governance and funding issues: 1990 to 1995

In response to a shift in donor interests towards environmental issues, as articulated through the Brundtland Report (WCED, 1987), CGIAR adjusted its mandate. By 1990, CGIAR was "reorienting" its programmes to include NRM, forestry and agroforestry, broadening its work out from its previous "...pursuit of productivity-directed commodity research." (CGIAR Secretariat, 1991a, p.3)

Between 1991 and 1993, five Centres with a focus on NRM became part of CGIAR. This shift was, at least in part, in response to funding concerns. Donors were reducing their funding to CGIAR, as CGIAR's research agenda did not fit their changing priorities:

“...with surpluses and declining real prices of commodities in the developed world, the CGIAR system with its emphasis on agricultural growth in developing countries is a “tough sell” among donors.” (CGIAR Secretariat, 1992, p.3)

After the addition of new Centres, Members agreed some changes to CGIAR’s governance and structure for the first time i.e. some centralised bodies were established in 1993 (Finance Committee, Oversight Committee). However, the model of independent centres, with no central coordination, was maintained. Participants in governance debates, writing later, (McCalla, 2014 and Ozgediz, 2008a) characterised this episode as the first of many instances when a funding shortfall was addressed by expanding CGIAR’s mandate to access more funds, rather than focusing on core areas of work and restructuring.

External actors characterised CGIAR’s funding crisis and debates about expanding its mandate differently. GRAIN (1994) identified the funding crisis as arising from shifts in donor interests towards sustainability and equity concerns, but also CGIAR’s failure to respond to challenges to its linear pipeline model of research and its informal and opaque governance systems. GRAIN argued that CGIAR had

“...lagged behind in responding to external pressures such as: the need for transparency and accountability to the public; the need to democratise participation in and governance of the system; the need to address the demise of public research against the increasingly important role of the private sector; and an adequate response to the fundamental critiques of the Green Revolution.” (GRAIN, 1994)

The expansion of CGIAR’s research programme could be seen as an attempt to address some of those criticisms.

The process of expanding CGIAR’s mandate required a significant review of its governance systems and its vision and mission. This culminated in a ministerial level meeting, which CGIAR hosted in 1995. It was attended by ministers from CGIAR member countries (variously representing agriculture, development cooperation and education ministries), as well as representatives of foundations and international bodies that supported CGIAR. This meeting endorsed the ‘renewed’ CGIAR’s direction, issuing the Lucerne Declaration in February 1995 (CGIAR Secretariat, 1995).

The Lucerne Declaration articulated a changed direction for CGIAR, moving from a narrow focus on food production. It said that CGIAR’s research agenda would be:

“...aimed now at the multiple challenges of increasing and protecting agricultural productivity, safeguarding natural resources, and helping to achieve people-centered policies for environmentally sustainable development.” (ibid p.7)

The signatories to the Declaration endorsed

“...the vision of the renewed CGIAR of helping to combat poverty and hunger in the world by mobilizing both indigenous knowledge and modern science...” (ibid)

It further stated that CGIAR should “...conduct strategic and applied research, with its products being international public goods...” though it did not define that term¹² (ibid p.10).

The Lucerne Declaration also stressed CGIAR’s role in relation to partners in the South and poor farmers, and called for actions to broaden CGIAR’s partnerships. This was understood to mean both broadening CGIAR membership to include countries of the global South and finding ways to improve communication and collaboration with NGOs, private sector actors and NARS.

As a result, a number of partnership instruments were established. These included the NGO Committee and the Private Sector Committee, which had remits to build and strengthen CGIAR’s relationships with civil society and the private sector respectively. CGIAR also established the Global Forum on Agricultural Research (GFAR) and regional versions, as a collective voice for groups engaged with agricultural research outside CGIAR, particularly in the global South. With the creation of these partnership committees, new voices came into CGIAR. Their impact is discussed in Chapter Six.

5.4. Conclusion

This chapter has described CGIAR’s establishment and founding narratives. It has described how those founding narratives were challenged by external changes affecting PGR management. These included changes in global regulatory frameworks, the rise of private sector engagement in agricultural research, and more active civil society engagement with environmental issues.

CGIAR’s founding narratives were premised on an assumption that policy processes on IAR directions could be science-led. TAC and the commodity Centres maintained this approach. However, some CGIAR donors called for a new approach taking into account environmental issues and of the politics of global negotiations.

At the same time, other stakeholders, beyond crop breeders and researchers, demanded a voice in policy processes affecting the ownership, use and control of PGR. Developments in FAO and the CBD highlighted national sovereignty and the rights of other actors, such as farmers and national bodies, over PGR which had until that point been held by CGIAR. These new actors called on CGIAR to consider wider biodiversity conservation and environmental concerns beyond its own interests for crop breeding programmes; to consider the social

¹² The earliest document in the CGIAR archives with the subject tag ‘global public goods’ is dated April 1996

impacts of its research approach; and to include a wider range of voices in policy processes affecting PGR management.

1990 – 1995 also saw CGIAR suffering financial crises, in part arising from criticism from donors and external actors regarding its direction and research priorities.

CGIAR responded to these challenges by creating a process of ‘renewal’, which included reframing its research focus, broadening its membership and creating new partnership mechanisms. The reframing reflected external concerns about the social and environmental impact of its research approaches and rhetorically shifted its focus from crop productivity to poverty reduction. In this way, changes to CGIAR’s narratives about its work could be seen to reflect donor and other external interests, and the reduced power of TAC and Centre scientists to set the research agenda.

From 1990 – 1995, CGIAR also focused on developing policy positions on IP, PGR management and biotechnology, in line with new global regulatory frameworks (CBD and TRIPS). In these policy processes, CGIAR’s positioned itself as providing public IAR by conducting PGR conservation and pre-breeding work that commercial actors would not undertake; and by providing internationally applicable research. However, CGIAR did not address further questions of who, within different countries, might benefit from their research. It did not examine at System level questions of equity in the provision of goods, despite concerns raised by Centres (e.g. ICRISAT) and others (e.g. Siebeck and Barton, 1991). There was some consultation with stakeholder groups, but no opportunity for actors outside the CGIAR System to participate in decision-making about its research directions. Despite a shift in decision-making power towards donors, TAC and the Centre Directors retained control over policy processes.

While CGIAR sought to adapt its work and policy approaches to fit with changing global regulatory regimes, it retained its core focus on crop breeding work and *ex situ* PGR conservation. It reframed its work in those areas to position itself as central to new global PGR conservation frameworks, and to align its work with increased donor concerns about sustainability issues. As part of that process, CGIAR highlighted its role as holder of PGR in trust for the international community. It claimed a role for itself at the centre of FAO’s proposed genebank network. However, this positioning can be seen as CGIAR acting to preserve its funding and relevance.

Similarly, while claiming a central role for itself as protector of publicly-owned PGR, it engaged in negotiations with FAO over which kinds of PGR were subject to which ownership and control

rules. In its negotiations with FAO over the management of genebank collections, it sought to protect its own interests by drawing boundaries around its own research products, often excluding them from PGR to be held in the public domain.

Despite the challenges to CGIAR's narratives, research approaches and priorities, it continued to claim it acted as a technical body, providing politically neutral scientific research. It claimed that political negotiations on PGR policy were FAO's remit. It retained its focus on crop development, and reiterated its role in biodiversity conservation through providing new varieties to commercial breeders.

The process of developing policy during this period (as later) was lengthy and iterative and documents from the period reflected attempts by CGIAR actors to find ways through conflicting positions to come up with policies that all stakeholders could support. However, by 1995, it had made little progress.

Uncertainty about global regulatory frameworks continued after 1995, as the process of renegotiating the IU began. Negotiations continued over issues that were not resolved under the CBD, such as farmers' rights, the status of the international genebank collections and access and benefit sharing arrangements. These all affected CGIAR's work and the policy environment in which it operated. Chapter Six examines these issues and CGIAR's responses from 1995 – 2007.

6. 1995 – 2007

6.1. Introduction

Chapter Five has described the development of CGIAR's policies on plant genetic resources (PGR) management and intellectual property (IP) from 1990 to 1995, and major changes in global regulatory frameworks that influenced their development. It laid out the internal and external actors who participated in shaping policy directions, and the positions they held.

This chapter describes the impact of the internal changes agreed in 1995 on CGIAR's approaches to its research agenda; and the continued impact of developments in global regulatory frameworks on CGIAR's policies for PGR management and IP rules. The chapter charts internal and external contestation over CGIAR's purpose and direction, its research priorities and its place within a changing international agricultural research (IAR) system from 1995 to 2007.

The chapter also considers the development of CGIAR's narrative about its role as a provider of public goods, and the debates – both ethical and practical – about how that term might be understood, and what different understandings might imply for CGIAR's research priorities and ways of working.

The chapter is divided into three time-frames, to facilitate understanding of how issues were debated concurrently and influenced each other.

The first sub-section covers 1995 to 1999. In response to the 1995 Lucerne Declaration, CGIAR introduced a new organisational structure, a new vision and a new approach to building relationships with other actors in the IAR system. These included actors from the private sector, civil society and other research institutions, bringing new voices and perspectives into CGIAR. CGIAR characterised this shift as recasting its work to be more strategic and more engaged with partners in the global South and at the grassroots (CGIAR Secretariat, 1994a).

Changes in international regulatory frameworks for PGR, such as the renegotiation of FAO's International Undertaking (IU) on Plant Genetic Resources also had an impact on CGIAR's policy directions. Those changes meant that CGIAR had to clarify its role in, and approach to, issues of biotechnology, IPRs, PGRs and private sector involvement in research. These debates raised questions about CGIAR's purpose, how it operated, with whom it should partner and how it addressed its mandate – newly-defined at Lucerne – to provide pro-poor research.

The second section covers 1999 to 2002 when CGIAR was focused on the renegotiation of FAO's IU, and came under increasing pressure from NGO activists over its handling of its

genebank collections. Contrasting understandings of the economic, environmental and social value of PGR informed the positions of different actors engaged in renegotiating the IU, and CGIAR had to decide its position and role within that contestation. These issues are explored through an examination of the debates in the process of negotiating the new IU, and in controversies over CGIAR's actions to develop a new IP policy. The section also examines continuing internal debates about CGIAR's role, purpose and interpretations of its GPG mandate.

The third section covers 2002 to 2007, during which CGIAR acted to address the demands placed on it by the newly adopted Seed Treaty. It also had to respond to a funding crisis arising from increasing donor dissatisfaction with its governance systems, research directions and insufficient impact on poverty reduction. It sought to address these concerns through the development of System Priorities, by re-examining its approach to its GPG mandate and by developing new programme structures. These required shifts in its approach to genebank management, information management and IP policy, to enable the creation of new partnership mechanisms for conducting research and delivering research outputs.

Debates about what CGIAR did, how it did it and with whom, were closely intertwined after 1995. Organisationally, 1995 – 2001 was characterised by trying to reconcile CGIAR policies and practices with positions held by new partner bodies; 2001-2007 was an almost continuous process of organisational change and reform, responding to funding crises arising from the lack of clarity over CGIAR's direction and purpose. Key questions – about the role of science in CGIAR, how it enacted its 'public good' mandate, how CGIAR should be organised and where it should be positioned in the wider IAR ecosystem – were all interlinked. This chapter attempts to unravel those entangled threads.

Chapter Seven, which follows, covers the period from 2007 to 2012.

6.2. 1995 – 1999

CGIAR's new structure, created after the Lucerne Declaration, brought new voices into CGIAR. Private sector and civil society actors (represented through the Private Sector Committee and the NGO Committee) brought radically different perspectives to questions of CGIAR's role and purpose. Additional perspectives were brought in by new member countries from the global South joining CGIAR between 1994 and 1995 (CGIAR Secretariat, 1997b). Those new actors contributed their perspectives to policy debates about PGR management, IP rules and related issues, which were affected by ongoing changes in global regulatory frameworks.

6.2.1. External events affecting CGIAR's role and mandate

6.2.1.1. Negotiations in multiple fora

Issues around the use, management and governance of PGR were subject to intense contestation from 1995 in global fora such as the CBD and FAO and internally within CGIAR. CGIAR often claimed that it was an objective provider of technical advice to those setting the global governance frameworks, but it actively engaged in helping to shape those frameworks, as well being shaped by them. Some of the multiple strands of this complex process are described in this section.

As explained in section 5.3.1.4, CGIAR Centres signed agreements with FAO in 1994 to place the genebank collections under FAO's auspices. Those agreements set the terms of the Centres' trusteeship of PGR. Additionally, the agreement between the International Plant Genetic Resources Institute (IPGRI, formerly IBPGR) and FAO delineated areas of responsibility between them, with FAO having responsibility for legal and policy issues relating to the genebank collections, and IPGRI providing scientific and technical support (CGIAR TAC and CGIAR Secretariat, 1997).

The CGIAR-FAO agreements related to the genebank collections, but the CBD covered "...all aspects of the conservation and use of all genetic resource..." (CGIAR Committee on Genetic Resources, 1995, p.3) thus providing an overarching policy framework within which CGIAR should operate. However, the CBD did not treat PGR for food and agriculture (agrobiodiversity) differently from other genetic resources. To address this, parties to the CBD asked FAO to find ways to resolve a number of 'outstanding issues', including:

"...the status of pre-CBD ex situ collections, the implementation of farmers' rights, and terms and conditions for accessing genetic resources." (CGIAR TAC and CGIAR Secretariat, 1997, p.2)

To address these issues, the IU had to be renegotiated to align with the CBD (CGIAR GRPC, 1997a).

PGR issues were also under discussion in WTO (TRIPS), the FAO Commission on PGR, UPOV, the Conference of the Contracting Parties to the CBD, and global events such as the World Food Summit (1996), and the International Technical Conference on PGR (1996) (CGIAR GRPC, 1995).

GRPC produced a report in 1995 (*ibid*), which outlined the implications of these changes for CGIAR. The report raised concerns about the lack of coherence across the different fora, and the consequent policy vacuum on some issues. This had practical implications for CGIAR as it

sought to reach agreement with FAO regarding the terms under which different forms of PGR could be distributed. For instance, CGIAR agreed that Centres would not take out IP on any PGR acquired before the CBD was passed, and they would not allow recipients of PGR from Centre genebanks to take out IP either. To enforce this, recipients had to sign Material Transfer Agreements (MTAs) which specified the terms under which they were receiving 'in trust' PGR (CGIAR Secretariat, 1998). However, new mechanisms were needed for germplasm collected post-CBD and for "...centre-improved germplasm." (CGIAR GRPC, 1995, p.6)

GRPC also recognised the significant policy implications for CGIAR's work of the renegotiation of the IU. These included bringing genebank collections under the auspices of any new IU; developing CGIAR's role in benefit-sharing e.g. through provision of improved germplasm; and new governance arrangements including closer working with the Commission at FAO (CGIAR GRPC, 1999).

While the work of CGIAR Centres was affected by new governance structures for PGR, CGIAR was also a participant in the debates about the shape of future arrangements. CGIAR was primarily represented by IPGRI in committees of the CBD, and in the FAO Commission on PGR. IPGRI also provided technical support to the deliberations in these bodies and was therefore on both sides of the supposed science/policy divide. Through IPGRI's inputs, CGIAR played a key role in shaping the debate about PGR governance, framed as providing "...scientific and technical advice..." (CGIAR Secretariat, 1996b, p.56) even while it had its own interests in the deliberations.

A review of IPGRI by TAC and the CGIAR Secretariat in 1997 identified the political impact of the changing global governance framework. The reviewers argued that the CBD and the TRIPS agreement had shifted perspectives from considering PGR as elements of an agricultural production system towards

"...an 'industrial' approach which views genetic diversity as an economic commodity subject to national sovereign ownership and intellectual property rights." (CGIAR TAC and CGIAR Secretariat, 1997, p.71)

This shift in the understanding of the value of PGR affected CGIAR profoundly, as IPGRI suddenly found itself "...in the middle of a heated and highly politicised confrontation of economic interests involving PGR on a global scale." (ibid)

6.2.1.2. FAO's Global Plan of Action on PGR

CGIAR's work was further shaped by the Global Plan of Action on PGR (FAO, 1996), agreed by 150 governments at the FAO International Technical Conference on the Conservation and Utilization of PGR in 1996.

The Plan focused specifically on PGR of relevance to food and agriculture. It highlighted the value of *in situ* conservation programmes; the need to develop more coherence between *in situ* and *ex situ* conservation; the value of farmers' knowledge about the crops they grow; the need to support on-farm conservation and community seed-sharing initiatives; and the need for co-ordinated funding for global conservation work (FAO, 1996).

The Plan called for actions to ensure the realisation of Farmers' Rights, and equitable benefit-sharing; for improved conservation of farmers' varieties and crop wild relatives (CWR); for more participatory and gender-sensitive conservation and farm management programmes, including more collaboration between farmers and researchers; and conservation in genebanks of a wider range of genetic material, including 'under-utilised' crops (ibid).

In relation to *ex situ* conservation, the Plan called for improvements in the standards of storage of germplasm; rationalisation of genebank collections (e.g. to minimise duplication); and improvements in the identification, characterisation and documentation of germplasm held in genebanks. The Plan therefore had direct implications for CGIAR's work, including regarding funding for the proposed improvements in genebank management and information programmes (CGIAR GRPC, 1996).

The Plan did not explicitly address policy issues, but the actions required to implement the plan had policy consequences for CGIAR. The call for greater consideration of ecosystems and biodiverse environments within which crops developed called into question CGIAR's focus on *ex situ* conservation. Similarly, the call for more engagement with farmers in conservation and crop development challenged CGIAR's scientific research approach. CGIAR's internal debates, such as those in the Ethics and Equity workshop (see section 6.2.5), overlapped with the more holistic approach to PGR conservation laid out in the Plan.

The Plan also required improvements to the maintenance and standards of conservation in all genebanks, including CGIAR's. The Plan provided international agreement on the development of a global system of genebanks, which GRPC argued CGIAR should take a lead role in implementing. This would include securing funding for its own genebanks in the context of the development of "...a firm funding base for the evolving global system and the FAO Network of International *Ex Situ* Collections." (CGIAR GRPC, 1997a, p.5)

6.2.2. Governance issues

Following the Lucerne process in 1995 (see section 5.3.4), several internal changes were instituted. These included bringing donor funding for specific projects into core funding, and the World Bank ceasing to provide funding for otherwise under-resourced projects. The result was that projects which had not been part of CGIAR's core work became incorporated into the core, and TAC-recommended projects which did not receive donor interest were no longer funded.

McCalla (2007) considered that those changes

“...effectively severed any linkage between System/TAC priorities and fund allocation, meaning that...the Program of the CGIAR was the sum of decisions taken independently by 18 Centers.” (McCalla, 2007, p.11)

Ozgediz (2012, p.xv) argued that the changes reduced TAC's power in relation to both the Chair and the donors, increased Centres' power within the CGIAR system, and increased donor power over setting the research agenda.

Additionally, in 1995, both the NGO Committee (NGOC) and the Private Sector Committee (PSC) were established, creating two new internal bodies with active interests in CGIAR's handling of PGR and Intellectual Property (IP) issues.

The PSC considered its purpose to be to help CGIAR better understand private sector interests, and to work on areas of shared concern such as IPR. CGIAR, for its part, could

“...play a catalyst role in forging better links between the needs of the developing countries and the interests of the private sector.” (CGIAR PSC, 1996, p.1)

PSC further considered its role as providing advice at System level to CGIAR on how to develop effective partnerships with private sector (PS) actors, including through finding common approaches to issues arising across Centres as they developed public-private partnerships.

Similarly, the NGOC saw its role as increasing understanding between CGIAR and civil society groups, including farmer and producer organisations. Its focus was on promoting concepts of sustainable agriculture with CGIAR, and strengthening “...a people-centered approach to sustainable agriculture research and implementation”. (CGIAR NGO Committee, 1995, p.1). However, it took a more adversarial role than the PSC. By its 3rd meeting, it had identified its goal as

“...nothing less than the promotion of major changes in global agricultural research and in how CGIAR centers work with farmers and NGOs.” (CGIAR NGO Committee, 1996, p.2)

Alongside the two partnership committees, the Genetic Resources Policy Committee (GRPC), an internal advisory body, was also established in 1995. It had a System-level oversight role, with the remit to monitor the implementation of relevant international frameworks relating to PGR. It was additionally tasked with considering legal and ethical issues relating to CGIAR's management and use of PGR.

Beyond work on PGR, following the Lucerne process, CGIAR members sought to put in place governance changes that would help move CGIAR research in the agreed new, poverty-focused direction.

A press release after MTM96 stated:

“In concluding its four-day annual meeting...[CGIAR]...decided that its research programmes to 2000 will be skewed in favour of the poor.” (CGIAR Secretariat, 1996a, p.1)

That statement begged the question: who CGIAR had previously favoured in its research?

CGIAR defined its new 'pro-poor' role in terms of providing 'high science' to poor people in LICs. At the Mid-Term Meeting 1997, CGIAR's Chair sought to reassert CGIAR's position as uniquely able, and willing, to provide needed technologies to poorer countries. The Chair argued that privatisation processes threatened to put new technologies beyond the reach of many people, creating a “scientific apartheid” in which people in the global South were unable to access the results of new scientific developments (CGIAR Secretariat, 1997b, p.19).

The Chair presented CGIAR as therefore having a vital role to play in bringing high science (i.e. biotechnology) to LICs. To do this, CGIAR had to maintain a place at the cutting edge of scientific development.

Discussion at MTM97 on CGIAR's positioning was all-encompassing, covering “...focus, roles, policies, norms, scientific tools, partnerships, tensions, organization, and efficiency.” (ibid p.29) This demonstrated the range of contests over CGIAR's purpose and processes.

In 1997, the Third System Review (TSR) of CGIAR was initiated, which examined CGIAR's position in the global IAR system, including its engagement in global policy (ibid). The TSR (completed in 1998) called for a consolidation of Centres and their activities across the System but made no recommendations on structural reform to enable this. It also recommended the creation of a legal corporation with a central Board, arguing that because CGIAR was not a recognised legal entity it could not take out patents and gain legal ownership of its research products. However, Members rejected that recommendation (Ozgediz, 2012).

The TSR also explored CGIAR's claims to political neutrality. The review team commented that changing external frameworks had

“...political implications for the CGIAR's ability to pursue its mission and goals, including free access to and exchange of genetic resources. Thus the non-partisan, nonideological character - perhaps an asset in times past - has left the System vulnerable to international agreements and policies that could severely limit its effectiveness in addressing its mission.” (CGIAR System Review Secretariat, 1998a, p.65)

While CGIAR's earlier claims to political neutrality may only have been rhetorical, the TSR explicitly recommended that CGIAR develop policy positions in its own interests, and defend those positions in political arenas such as FAO negotiations.

As a result of the TSR, the Group decided in 1999 to commission TAC to lead a “visioning exercise” (CGIAR Secretariat, 1999, p.3). This led to the Change Design Management (CDM) process, which was completed by 2001, and which is discussed in section 6.3.2 below.

6.2.3. Biotechnology debates

One of the first issues that the partnership committees considered was how CGIAR should respond to developments in biotechnology. While controversies over biotechnology are beyond the scope of this thesis, policy debates on biotechnology, IP and the use of PGR were inevitably entangled. The summary below outlines positions on biotechnology held by different actors, as relevant to perspectives on IPRs and public goods.

Biotechnology was a major topic of debate at CGIAR's mid-term meeting (MTM) in 1997 (CGIAR Secretariat, 1997b). The debate was informed by inputs from numerous internal committees as well as a broad stakeholder consultation.

The PSC presented a paper arguing in favour of CGIAR expanding its biotechnology work (CGIAR PSC and Ozgediz, 1997). The paper argued that doing so would enable CGIAR to engage at the ‘cutting edge’ of scientific research, and increase its access to private sector proprietary technology. The PSC was strongly in favour of supporting developing countries to develop their own IP regimes, in order that they could attract private sector investment. It saw a role for CGIAR Centres to act as brokers in this process, “...linking companies with markets...” (ibid p.2). It clearly stated its desire for CGIAR to act in the service of private sector interests. It acknowledged that CGIAR's public goods remit might be a barrier to the shift they were calling for, but did not consider this a problem. It argued that:

“An increased role in biotechnology...would compel the CGIAR to reconcile the public good nature of its work with the norms prevailing in the biotechnology industry, such as patenting and licensing.” (ibid, p.i)

The NGOC also submitted a contribution to the debate (Altieri, 1997). That paper expressed concerns that CGIAR's research goals were narrowly focused on increasing yields. It questioned the push towards biotechnology in the light of commitments under the 'renewal' to recognise the role of farmers' organisations and other civil society groups in research processes. Altieri was particularly concerned that private sector interests would lead to the development of products for which there was a commercial market, rather than products of relevance to, and affordable by, resource-poor farmers. But NGOC was not opposed to biotechnology. The paper argued for CGIAR to take a lead role in developing pro-poor biotechnology, in alliance with NGOs and farmers' organisations, arguing that it should be seen as one tool among many. It also called for research into agroecology and for a greater focus on participatory research.

The NGOC's paper emphasised that:

"The real challenge for the IARCs in engaging in the biorevolution is to gear biotechnological research towards the specific problems of the rural poor..." (ibid p.2)

The TAC endorsed the PSC's call for CGIAR to increase investment in biotechnology (CGIAR, 1997), but not the NGOC's call for research on "...overlooked traditional crops..." (ibid p.4) or "...diversified farming..." (ibid p.3). However, Centres and GRPC took a more cautious view.

The Centre Directors' Committee (CDC) argued:

"...that the CGIAR has an advantage in developing technologies that are difficult to appropriate (e.g. open pollinated, farmer held, self replicating or self sustaining technologies), that provide social returns that are hard to capture by individuals or enterprises, and that are closely associated with the genetic resource base husbanded in CGIAR centers." (CGIAR CDC, 1997, p.11)

On that occasion, the CDC presented a view of CGIAR's role and purpose at odds with that promoted by the PSC and TAC.

The GRPC stressed the need for CGIAR to clarify its position on IP and on biotechnology, to give Centres clear guidance for their work and stated:

"The lack of clarity on what the CGIAR stands for makes interactions difficult." (CGIAR Secretariat, 1997b, p.45)

As a result of the 1997 debate, TAC established a panel on biotechnology. Its report and recommendations, presented in 1998 were accepted by members (CGIAR, 1998). The report acknowledged that some areas of biotechnology were controversial, but its clear conclusion was that CGIAR should embrace this technology. It noted that biotechnology should be integrated into Centres' wider work on crop development, and that there could be "...a strong role for the CGIAR in genomics, i.e. developing and supplying molecular biological information..." (ibid p.2).

To develop the capabilities to take on this role, the Panel argued that the Centres needed to become major players in “...policies on the acquisition and utilization of information on molecular genetics...” (ibid, p.9). It saw CGIAR as being in a “...strong position to act as a catalyst to foster these contributions, while strengthening its own role as a significant user of biotechnology to further the aims of its mission.” (ibid)

There were caveats and qualifications from various quarters. The Panel itself warned against biotechnology changing the direction of CGIAR’s research; the Centres noted the need for the “...prudent application...” of biotechnological tools, and the CGIAR members, while accepting the report’s recommendations, noted the need for biotechnology research to take place “...within the ambit of agreed-upon ethical principles, and with necessary precautions to ensure safety.” (CGIAR Secretariat, 1998, p.30).

The Panel report on biotechnology broadly reflected the views advanced by the PSC rather than the NGOC. The report demonstrated the close links between debates about CGIAR’s role in relation to ‘cutting edge’ science, its work priorities (e.g. developing capabilities in bioinformatics), and the position it should take in negotiations in international fora on the rules for managing PGR, and its associated information.

The report pushed CGIAR towards genomics and bioinformatics research; which in turn implied extracting molecular level information from PGR it held in its genebanks. Having extracted the seeds from their ecological context, genetic information was increasingly being extracted from the seeds. Negotiations on the agreements with FAO, and on the implementation of CBD were taking place as the parameters of scientific research were changing.

6.2.4. Intellectual property

Issues of how CGIAR should deal with IP were hotly debated by stakeholders in this period, closely tied to the rising importance of biotechnology outlined above.

Following the recommendations of the *ad hoc* Panel on IP convened in 1994 (section 5.3.3.), CGIAR again revised its IP guidelines for Centres. These were submitted to CGIAR members for approval at the 1996 annual meeting. However, Members were wary of endorsing guidelines which might be seen to pre-empt decisions made in international negotiations, and instead decided to approve them as working guidelines only, to be reviewed (CGIAR Secretariat, 1997c, p.67).

At MTM97, the CGIAR Chair (Ismail Serageldin) argued for a new approach to IP. He expressed the view that, given the increased role of the private sector in agricultural research,

relationships between public and private sector researchers had to change to avoid a productivity and technology gap between the North and the South.

“...the manner in which the research is carried out, including the need for intellectual property rights to recoup their investments, will make it impossible to practice the open exchange of information and germplasm that have been the hallmark of the past.” (CGIAR Secretariat, 1997a, p.19)

At the same meeting, the PSC expressed its strongly held views about the need for Centres to support developing countries to develop their own IPR, and to ensure public sector access to technologies protected by IP rights (see 6.2.3). The Centres, meanwhile, made clear their frustration at the lack of guidance on IP issues, calling on CGIAR members to decide on common approaches across the CGIAR System (CGIAR Secretariat, 1997a, p.45). For their part, the GRPC suggested that the draft principles on IP should remain under review, and that CGIAR needed to pay greater attention to issues of access and benefit-sharing, and ownership and rights issues relating to PGR held in CGIAR genebanks (ibid p.46).

Discussion at MTM97 concluded with CGIAR deciding to set up two panels under TAC, one as described in section 6.2.3 to review biotechnology and the second to look at IP issues.

The latter panel presented its report to MTM98 (CGIAR Panel on Proprietary Science and Technology, 1998). This report reflected significant debates and differences in opinion held by members of the Panel, at a time when the governing frameworks for PGR were in a state of flux.

For example, the Panel identified potentially conflicting rights regimes relating to PGR, which were emerging as international regulatory frameworks changed. Alongside formal IP regimes, there existed “...alternative rights regimes” (ibid p.1) including Farmers’ Rights, collective and traditional rights, and national resource rights under the CBD. The Panel considered that

“Both intellectual property rights and alternative rights regimes can potentially impact the way IARCs co-operate with national programmes and other partners in developing countries, and must be taken into account by the CGIAR system...” (ibid)

However, the Panel did not deliberate further on their relevance to CGIAR’s work; instead it focused on the impact of IP on the production and dissemination of technology to farmers, rather than on how to ensure the knowledge and technologies of farmers were adequately acknowledged, respected and protected.

The report presented an overview of three different positions held by panel members, without making a firm recommendation itself. The positions were:

1. The extension of IP regimes: This position argued that biotechnology development was essential to address food security, and to enable this, CGIAR should support the extension of IP regimes as well as conducting research into biotechnology itself. The establishment of IP regimes was needed to ensure appropriate incentives for innovation by the private sector, and for effective market functioning to disseminate new technologies.

Holders of this position further argued that CGIAR should not position itself as a 'voice for the poor':

"They believe this would polarise the CGIAR's supporters; put at risk its scientific credibility; and undermine its ability to continue its enormously valuable technical contribution to the welfare of the poor." (ibid p.16)

This position reflected confusion over CGIAR's role in relation to 'the poor'. It pitted providing technical assistance to farmers against championing their interests in a changing regulatory framework, suggesting a contradiction between these two areas of work. The report did not expand on how CGIAR's work would change if it chose to act as voice for the poor rather than just providing technical services.

2. Work within existing and future frameworks: This position argued that CGIAR could fulfil its mission without shifting its research agenda towards biotechnology; and that CGIAR should concentrate on understanding and working within the existing situation, adapting as necessary as regulations changed.

3. Challenge the direction of change in IAR: Following the logic of the alternative rights regimes highlighted above, some panel members argued that CGIAR should not be conducting research into crops for 'industrial' agriculture because this would not address the needs of the poor. Instead, it should be looking into the management of "...diversity-based agricultural systems..." based on "...high inputs of local knowledge and the fruits of participatory research." (ibid p.17)

In this view, IPRs created a barrier to achieving CGIAR's mission, because they enabled the appropriation of knowledge, seeds and technologies developed by farmers, limited the free exchange of PGR and knowledge and made useful technologies too expensive for poor farmers. More profoundly, they caused a shift in research agendas "...in the direction of products that are profitable in larger-scale markets and/or produced by large transnational firms." (ibid) This shift undermined small-scale farming systems, replacing them with "...monocultures and increased uniformity, both genetic and cultural..." (ibid).

In this view, CGIAR should actively campaign against TRIPS, and

“...should work in concert with others to establish an alternative IPR regime that will enable it to conduct its historic mission of making freely available varieties to the poor and to developing countries.” (ibid)

Debate in this Panel thus reflected wider debates about governance of, and directions of change in, the global agri-food system. The report drew attention to ethical questions raised by the expansion of IP rights, and highlighted differences of opinion between panel members, on the value (or otherwise) to CGIAR’s work of this expansion. Differences were less about the practicalities of how Centres should operate within existing IP regulatory frameworks, than about what “...an ideal situation should be...” (ibid p.14) and whether CGIAR should act to support one or other possible future arrangement.

However, rather than addressing these conflicting positions, and making clear recommendations advising CGIAR members about the approach they should support, the Panel limited its recommendations to what it saw as practical actions the Centres needed to take to facilitate their work.

Given the level of disagreement among its members, the Panel limited itself to a few recommendations that could be supported by all stakeholders. Specifically:

- Decision-making about IP should be based solely on helping CGIAR achieve its ‘mission’.
- Research should never be undertaken only to generate income or to provide ‘bargaining chips’ to help CGIAR access proprietary technology owned by others.
- CGIAR should improve its competence in dealing with IP, including by setting up a central office to advise Centres.
- The Guiding Principles on IP should be “...revised, formalised and enforced...” (ibid) to ensure consistency in Centres’ use of IP and to minimise any possible legal risk.

This period can be seen as one of transition, from a public goods regime in PGR governance to a regime based on IP. The Panel laid out clearly different views regarding who might benefit from the new IP regime being established but made no comment about who CGIAR should align with in the process of regime formation or resistance.

Debate within the Panel reflected competing narratives about the value of biotechnology and therefore IP, and competing world-views about the relationship between science and society. Panel members held different views about whether increasing privatisation of previously public goods was of benefit to poor farmers, and how CGIAR should act in response to this moving boundary: whether it should operate within the boundaries set by the emerging private rights regime, or challenge the move of the boundary across its domain.

These fundamental disagreements about how CGIAR should fulfil its mission (or even how it defined its mission) meant that the Panel could not guide Centres on whether to challenge privatisation processes. Guidance was limited to where Centres should draw the boundary in relation to their own research outputs, and which side of the boundary they should position themselves on in relation to products owned by others.

The Panel decided that it was not its role to “...judge whether the current proliferation of intellectual property claim[s] is beneficial or detrimental to the ultimate aims of the CGIAR.” (CGIAR Panel on Proprietary Science and Technology, 1998, p.1), thus side-stepping the profound conflict over directionality in agricultural development underpinning their deliberations. Rather, it focused on practical actions Centres should take to operate within the “...current systems of rights...” (ibid p.xiii). In doing so, it effectively recognised the use of IP in CGIAR operations *de facto*.

In responding to the report, TAC recognised the potential impact of expanded IP regimes on CGIAR’s mandate to produce international public goods:

“Biotechnology is opening up new possibilities and new opportunities to make proprietary claims, in effect thereby permitting the removal of some products from the public goods portfolio.” (ibid p.vi)

TAC thus acknowledged that goods are not objectively public or private, but their public-ness depends on choices made about what rules apply to them (see discussion in chapter 3).

However, TAC did not consider this to be problematic for CGIAR’s work:

“...to the extent that the CGIAR intends to use property rights to maintain the products in the public domain, the products retain some of the characteristics of non-proprietary goods.” (ibid)

TAC endorsed the Panel’s recommendations, including the limited situations in which Centres could seek IP protection for their own research, the need for better legal advice, and to revise the IP guidelines.

In doing so, the TAC demonstrated its leanings towards expanding the IP regime. TAC, alongside the Panel, put to one side the ethical questions raised by the debate, and shied away from an examination of its implications. While this could be considered a pragmatic response to the differences of opinion amongst CGIAR’s stakeholders, it left the underlying conflict unresolved, ready to re-surface in the future.

Following the Panel’s report and the TAC, CGIAR decided to set up a central advisory service on IP and biotechnology (established in 1999), and to commission an audit of existing Centre practices relating to IP.

The Third System Review (TSR), which reported in October 1998, challenged CGIAR on its failure to grapple with the politics of the emerging IP regime. It argued that CGIAR needed to decide its policy positions on highly political issues such as IP, and would have to be proactive in supporting its policy positions in international bodies such as CBD and FAO (CGIAR System Review Secretariat, 1998b, p.66).

While it did not state explicitly what those policy positions might be, the recommendation was framed in terms of CGIAR's need for clear policies on IP if it wished to increase partnerships with private sector actors, demonstrating implicit acceptance of the expanding IP regime.

6.2.5. Ethical issues

At its first meeting in 1995, the GRPC agreed the extensive range of issues that would come under its remit. These included policy issues relating to PGR collection, acquisition and access; management of data relating to PGR held in genebanks, including indigenous knowledge; plant variety protection systems; relations with external actors and CGIAR's role within the global PGR management system; biotechnology and biosafety; *in situ* conservation; other genetic resources (not plant); and financial issues.

It also identified ethical questions arising from deliberating on these issues and asked IPGRI to organise a workshop for CGIAR stakeholders to discuss ethical dimensions of CGIAR's management of PGR (CGIAR Committee on Genetic Resources, 1995). The aim of the workshop was to identify and consider ethical concerns in relation to CGIAR's role as trustee of global genetic resources, its purpose as an organisation conducting scientific research, and its humanitarian mission; and to develop a code of ethics which incorporated perspectives beyond the scientific ethos. These principles were to help CGIAR identify its ethical responsibilities and therefore its role in the wider IAR system.

The premise of the workshop was that CGIAR's work was underpinned by scientific research ethics, but that these may not adequately address broader ethical considerations, such as equity and poverty issues, conservation concerns or the ethics of trusteeship. Examining those "...ethical underpinnings of the CGIAR's work in genetic resources..." could help CGIAR understand the values held by other stakeholders and therefore build partnerships with those "...that share one or more of the ethical and moral values that we claim." (Hawtin, 1997, p.vii)

The workshop involved approximately 60 participants, including CGIAR Centre staff, board and committee members, and representatives of NARS, farmers' groups, community groups, NGOs, academic institutions and commercial companies. Topics covered included biotechnology, biosafety, relationships with private sector actors, working with

farmers/community groups, implementation of Farmers' Rights, CGIAR's trustee role, and socio-cultural issues including gender equity.

A number of issues came up repeatedly in the papers and discussions:

- Scientists must acknowledge the social and ethical implications of their work. CGIAR's failure to take account of social and ethical concerns had reduced its effectiveness. Critics of the social and environmental impacts of Green Revolution technologies were developing new approaches based on environmental sustainability and farmer participation, and CGIAR was not generally equipped to engage with such approaches¹³.
- Some stakeholders mistrusted CGIAR, not only because they considered the 'scientific ethic' to be too narrow, but because CGIAR's systems of decision-making were opaque, with no mechanisms for accountability to partners or farmers. There were also no mechanisms for farmers' representation, leaving CGIAR unable to find out what farmers needed and wanted. This led to calls for principles of mutual respect, participation, partnership and transparency to be included in the Ethical Guidelines being developed (e.g. Voss, 1997).
- Interlinked issues of Farmers' Rights, use of indigenous knowledge, benefit-sharing, *in situ* conservation and participatory research needed much more attention. However, there was recognition that regulatory frameworks were still being developed and other bodies governing the use of PGR were also grappling with the practicalities of applying agreed principles.
- CGIAR needed to clarify what it stood for. Its stated mission to help the poor was not precise enough to provide guidance on its role and ways of working (Hanson, 1997). This lack of clarity arose, in part, from CGIAR's failure to examine its ethical underpinnings. CGIAR had also not considered the relationship between means and ends:

"When the urgency of producing more food is used as justification for dispensing with the luxury of discussing how, the result is usually a reinforcement of the status quo. It never becomes particularly convenient or appropriate to raise questions about the means. By implication and practice, ethical considerations are applied exclusively to goals, and not to the strategic choices of how to achieve them. They do not relate to the costs involved in pursuing one path rather than another." (Fowler, 1997, p.73).

¹³ A notable exception was the CGIAR Programme on Participatory Research and Gender Analysis, which began in April 1997 (Prain et al., 2000)

This observation went to the heart of questions about directionality and distribution (section 4.2.2.6) in relation to the technological developments produced by CGIAR's scientists i.e. who benefits from approaches chosen, which approaches are not pursued and does the choice of means affect the impact on goals. In this context, Fowler (1997, p.65) argued that:

“...the formulation of ethical guidelines are part of a larger process of struggle over the identity and purpose of the CGIAR, and a larger dialogue between the CGIAR and the “outside” world.” (ibid)

In other words, CGIAR's failure to examine its ethical basis had left it without a clear sense of its role in the IAR system. Stakeholders stressed that it also undermined trust in CGIAR's work:

“...ethical values for scientists ... must be clearly defined ... to guide interaction and build trust with local communities; **the institutional ethical values of the CGIAR are NOT clearly articulated and transparent;**” [bold and capitals in original]. (Anon, 1997)

- Assuming CGIAR was able to reach agreement on what it stood for, it should be much more pro-active and politically engaged in international fora in support of its position (e.g. Voss, 1997). CGIAR also had to be proactive in addressing inequalities, including in power relations between its own researchers and indigenous holders of genetic resources (Castillo, 1997).

Several other issues were raised but not explored, including:

- The central concept of ‘public good’, which was cited as informing CGIAR's ethical position, but was not defined.
- CGIAR's role in addressing market failure i.e. private sector actors' unwillingness to invest in long-term conservation, even though their own work depended on genetic diversity protected by CGIAR.
- The relationship between freely available PGR from CGIAR genebanks and patented commercial material:

“...the CGIAR system should acknowledge that there exists no clear scientific distinction between germplasm in a genebank and that same material removed to a breeding programme, or germplasm later developed into new commercial varieties. It is one continuum, and it is unfair if the front end is ‘free’ and the end-product is patented by any party, private or public.” (Balakrishna, 1997, p.125)

The draft Ethical Principles arising from this workshop were discussed at the 6th GRPC meeting (CGIAR GRPC, 1997b). The guidelines were organised under four headings, covering

“Equity; Trusteeship of Genetic Resources; Respect, Responsibility and Integrity in Science; and Social Benefits.” (ibid p.8)

The principles outlined under those headings represented the minimum level of agreement reached in the workshop discussions. They included some specific commitments:

- That in considering how to ensure equity “...emphasis be given to the needs of resource poor communities and to disadvantaged members of society, such as rural women.” (ibid p.9).
- That the contribution of farmers to conservation and genetic diversity needs to be recognised. However, its responsibility for benefit-sharing is limited to “...striv[ing] to ensure that the benefits derived...are made available to those that developed and nurtured these resources.” This could be interpreted as merely trying very hard to get seeds to farmers.
- That Centres’ responsibility as trustees of the genebanks is to “...be impartial and fair in their administration of the trust...” (ibid); to abide by national and international laws; and to make PGR “...readily available for use for the public good.” (ibid) ‘Public good’ was not defined.
- That research is for humanitarian use, not just for its own sake; that societal costs and benefits must be considered; and research should respect the cultures and values of partner communities and institutions.
- That “The CGIAR aims to promote lasting social benefit through its research for the international public good.” (ibid p.10), where ‘social benefit’ is defined in terms of increasing food security, and taking into account “...social and gender equity and environmental sustainability...” (ibid) in its work.

The draft guidelines were circulated widely within CGIAR, and a marginally revised version was adopted at MTM98 (CGIAR Secretariat, 1998).

The workshop reflected a process of grappling with complex ethical issues at a time when scientific research into genetic resources, and global governance structures for PGR, were changing rapidly. A wide variety of perspectives were presented and debated, but the resulting principles were vague and left considerable room for varying interpretations of key concepts. Despite claiming to represent a clear ethical position, the principles did not address some fundamental disagreements within CGIAR – in particular, what its relationship to ‘the poor’ should be. The principles did not provide guidance on questions of directionality in CGIAR’s research agenda, or provide a clear statement of CGIAR’s mission and role, and therefore left open the likelihood of future conflicts over the same issues.

6.2.6. Scope of CGIAR's PGR and public goods mandates

The renegotiation of the IU, to align with the CBD, had practical and policy implications for CGIAR's management of its genebank collections. In debates about forms of a future governance framework and access and benefit-sharing system, both IPGRI and GRPC consistently argued that arrangements should be on a multilateral basis (CGIAR GRPC and Swaminathan, 1996; IPGRI, 1996).

In order to develop a multilateral system, agreement was needed on what it would cover.

“A fundamental decision would be required as to the species coverage of any multilateral agreement. ...Should it cover all PGRFA, all food crop genepools, just crops of critical importance for food security?” (CGIAR GRPC, 1995, p.19).

This was a key policy decision, as crops included in the multilateral system would be maintained in the public domain, while those excluded would not. In this context, inclusion of a crop in CGIAR's 'mandate' was vitally important for its future public goods status.

GRPC argued for a system covering as many crops as possible.

At the same time, the detail of the implementation of a new system was tied up in negotiations over terminology. Work by CGIAR and FAO to clarify exactly what materials were covered by their existing agreements was part of the process of reaching agreement on future frameworks. Because germplasm designated as falling under the auspices of the FAO-CGIAR agreements was covered by MTAs (see 6.2.1.1), thus keeping it in the public domain, it was important to agree the criteria for 'designation' (section 5.3.2).

In October 1998, IPGRI produced guidelines for Centres to ensure consistency across CGIAR “...in determining whether materials should be formally designated under the Agreements with FAO.” (CGIAR GRPC, 1998, p.1).

In line with the principle of holding PGR in trust for the public, the guidelines stated that Centres should start from the assumption that all of the accumulated accessions should be designated unless the supplier had placed restrictions on the material; or if the same germplasm had already been designated by another Centre. Nonetheless, it was up to Centres to choose what to designate. The Guidelines clarified some elements of terminology in the FAO-CGIAR agreements, but other terms remained undefined. These included “...germplasm and related information...” and ‘derivatives’ (ibid p.2) from germplasm originating in Centre collections. Their definition, and therefore their status as public goods, was still to be agreed.

As discussed in section 5.3.2, in 1984, CGIAR decided to focus on its 'mandate' crops, and on *ex situ* conservation (CGIAR Secretariat, 1999). However, as a result of the passing of the CBD,

and in the context of the renegotiation of the IU, questions about CGIAR's role resurfaced. In particular, questions arose about the position of commodity crops in their wider ecosystems, the need for broader biodiversity conservation and CGIAR's responsibilities for conservation of genetic diversity beyond the genebanks.

The Third System Review (TSR), completed in 1998, examined the linked issues of farmers' rights and the scope of CGIAR's conservation work. The authors argued that on-farm conservation had not been given the same status as a 'public good' activity as *ex situ* conservation.

"Indigenous and rural families are thus conserving genetic variability for public good at personal cost. The concept of farmers' rights seeks to end the inequity inherent in the current recognition and reward systems." (CGIAR System Review Secretariat, 1998b, p.21).

The concept of farmers' rights raised questions about CGIAR's understanding of its public good mandate, including questions of which 'publics' benefitted from its research. For instance, a review of CGIAR's system-wide programme on PGR recommended broadening work on "...agrobiodiversity conservation..." beyond their mandate crops, particularly to support farmers on marginal land; and to support "...on-farm crop improvement and participatory breeding and gender." (CGIAR TAC, 1999, p.xl)

In parallel to questions of whether farmers on marginalised land, and women farmers, had been adequately served by CGIAR's research up to that point, concerns were raised about private sector access to PGR. For instance, at the Ethics and Equity workshop (section 6.2.5), participants asked:

"To what extent will it be acceptable to the world community to enter into agreements that afford bilateral benefits to private sector companies compared with multilateral benefits to partners in developing countries?" (CGIAR Secretariat, 1997a, p.46)

Similarly, the IPGRI review asked:

"...the question as to why private industry should continue to have free access to PGR as the basic raw material for their industry needs to be entertained." (CGIAR TAC and CGIAR Secretariat, 1997, p.108)

The shifts in understanding of the value of PGR introduced by the CBD left Centres grappling with the ethical, policy and practical problem of how to enact CGIAR's public goods ethos. They raised questions about unequal power to access PGR held in CGIAR's genebanks, but CGIAR failed to address those concerns. Similarly, negotiations on the scope of the IU informed internal discussions on the scope of CGIAR's mandate, including its responsibilities for non-

mandate and under-utilised crops, and *in situ* conservation. In this way, decisions in external fora reframed the parameters of CGIAR's work.

6.2.7. Conclusion: 1995 – 1999

The late 1990s was a period of uncertainty and contestation over the direction of change in the global agri-food system, and in global governance of PGR. The agreements of the CBD and TRIPS placed CGIAR's work on PGR management at the centre of highly political debates, and different stakeholders within CGIAR pressed for policies supporting one or other direction of change. Two distinct world views were emerging: in one, agricultural research should move towards supporting local approaches, farmers' rights, biodiversity conservation and crop development in the context of surrounding ecosystems; in another, agricultural research should focus on isolating genetic information from seeds, which could then be used across multiple crops and contexts, often to support an industrial agricultural production model.

Proponents of the first view considered that the interests of poor farmers in LICs would be best served by diverse research directions, identified through participatory research working with farmers. Proponents of the second view argued that CGIAR had a key role to play in ensuring that cutting edge technology reached farmers in LICs, as a means to improve their agricultural productivity and therefore reduce poverty.

These two views were in contention in internal debates in CGIAR over key issues including biotechnology, IP and PGR management. In debates over CGIAR's policy directions on biotechnology (section 6.2.3), CGIAR's Chair, major donors, the PSC and TAC all called for CGIAR to increase research into biotechnology, to stay at the cutting edge of scientific research for the benefit of poor farmers. This position built on CGIAR's founding narrative that its role was to provide internationally applicable science to LICs through a technology transfer model. Conversely, the NGOC and some Centres called for increased research into agrobiodiversity and 'orphan' crops.

Debates on IP (section 6.2.4) fell along similar lines, with some participants arguing in favour of extending IP rules to enable Centre researchers to work with PS actors and gain access to the proprietary technology necessary to expand biotechnology research. Others argued that CGIAR should actively challenge the expansion of IP rules, which they considered supported an industrial agricultural production model that disadvantaged poor farmers. A third group considered that CGIAR should operate within existing and future IP frameworks as they developed. In this case, CGIAR side-stepped the conflict between alternative views. Neither

the IP Panel tasked with examining the issue or TAC engaged with the ethical questions raised by the debate or provided any guidance to Centres on those concerns.

Ethical issues were considered in the Workshop on Ethics and Equity (section 6.2.5), where a wide variety of perspectives were presented and debated. However, the resulting principles were vague and left considerable room for varying interpretations of key concepts. In particular, no conclusion was reached on what CGIAR's pro-poor mandate implied for its research priorities or its ways of working.

Repeatedly, during this period, voices within CGIAR raised concerns about the impact on poor farmers of key policy decisions such as expanding the use of IP. Questions were raised about the relative power of poor farmers and major corporations to benefit from new frameworks for PGR management, but CGIAR did not engage with those issues. It did not engage with arguments put forward by proponents of alternative rights regimes in debates about IP, and did not try to develop approaches to uphold those rights.

In each case although alternative voices were heard they were unable to influence the direction of change. The dominant narrative of CGIAR's role – that it should provide cutting edge science to LICs – was supported by major donors including the World Bank, as well as scientists in the commodity Centres, and by the PSC. Within CGIAR's opaque decision-making processes, there was limited opportunity for alternative voices to influence key power holders such as the Chair, TAC or the World Bank. Additionally, in a time of change in global regulatory frameworks for PGR, CGIAR sought to maintain a position of seeming neutrality, claiming to stand outside the political debates. It acted to maintain existing positions until decisions were made about future directions.

CGIAR's members and other stakeholders were also participants in their own right in global bodies engaged in shaping the future governance of PGR. They therefore created networks of actors able to present similar positions across multiple negotiating fora. For instance, the expansion of IP rights included in the TRIPS agreement aligned with WB policies on opening up markets in LICs to private sector investment. PSC calls for CGIAR to change its IP policies in order to gain access to proprietary technology fitted into that trajectory.

As a result, CGIAR's narratives about its role in PGR management remained substantially the same as before 1995, and informed its positions going into negotiations on the IU.

6.3. 1999 – 2002

CGIAR's policy positions on PGR management were gradually defined over several internal and external processes from 1999 to 2002. The most important of these was the renegotiation of the FAO's International Undertaking (IU), which reshaped rules on the ownership, use and management of PGR. As part of this process, CGIAR also examined its Intellectual Property (IP) policy and engaged in internal debates about its Global Public Goods (GPG) mandate. Across all these processes, tensions increased between stakeholders with contrasting perspectives on how CGIAR should act to provide public research within changing regulatory and economic environments. These debates, and how they shaped CGIAR's policy directions, are explored below.

6.3.1. Renegotiation of the FAO International Undertaking (IU)

CGIAR's policy positions in relation to the management of PGR were gradually defined during the IU negotiations which led to the Seed Treaty in 2001. CGIAR played a critical role in the process, both as subject and participant. The management of PGR collections held in CGIAR genebanks was a key issue in the negotiations; IPGRI representatives attended the Contact Group meetings, officially in the role of observers; IPGRI provided technical support to the negotiations (FAO, 1999); and GRPC members engaged in formal and informal discussions (CGIAR GRPC, 2000b).

Despite its official role providing technical information to the negotiations, CGIAR also had its own policy positions, developed by GRPC, and pressed for specific outcomes. There was little internal contestation, with neither NGOC nor PSC engaging with the process as committees. CGIAR's position was therefore (unusually) clear and consistent throughout the IU renegotiations.

6.3.1.1. Negotiation topics affecting CGIAR

Initial issues under negotiation of direct relevance to CGIAR included (CGIAR GRPC, 1999):

- Whether PGRFA should be managed through a multilateral system under FAO (as existed under the IU) or bilaterally between nations (in line with the CBD).
- Practical arrangements for bringing CGIAR genebank collections into the new IU
- How 'benefits' would be defined, and the role of CGIAR Centres in providing them
- Governance implications for CGIAR Centres
- The scope of the new IU i.e. what crops would be included

GRPC members recognised the importance of the negotiations to CGIAR's future role, status, governance systems and funding, and highlighted the need to ensure that CGIAR members, who were parties to the negotiations, understood the implications for CGIAR of different outcomes (ibid).

By March 2000, agreement had been reached on developing a multilateral system (MLS) for managing PGRFA rather than bilateral arrangements (CGIAR GRPC, 2000b). Crops would be included within the remit of the MLS if they met the criteria of being both important for food security, and being interdependent internationally (see box 6.1) (FAO, 1997a). The two criteria were intended to provide a non-political basis for agreeing which crops to include in the MLS, and IPGRI provided technical information on this, and other relevant issues, to the negotiators (Esquinas-Alcázar et al., 2013).

Box 6.1 Interdependence of PGR

Plants, domesticated and grown for food, have over centuries been shared across the world, taken from one country to improve production of the same crop elsewhere. This has led to high levels of global interdependence in the genetic resources underpinning most major food crops. Kloppenburg and Kleinman (1988) measured this interdependence and estimated that, amongst others, "...the agricultures of Australia and North America...are almost completely based on plant genetic materials derived from other regions." (ibid p.181) They also found that Africa is highly dependent on crops, such as maize and cassava, originating in Latin America. No region of the world is self-sufficient in PGR for food and agriculture.

However, negotiations over the specific list of crops meeting these criteria were highly politicised, with countries of the North and South taking broadly opposing positions. In general, most industrialised countries wanted as much PGR as possible to be covered by the MLS, while countries in the global South wanted a more limited list of crops included, with several countries seeking to exclude economically important crops originating within their borders¹⁴. This was because countries in the global South, which were often rich in biodiversity, wanted to retain control over their PGR which might have commercial value. They were unwilling to grant seed companies free access to PGR which might be used to develop seeds that farmers in the South would then have to pay for. Conversely, industrialised countries, in which large seed companies were often based, wanted to retain free access to as much PGR as possible¹⁵.

Those positions reflected different framings of the value of PGR embodied in the IU and the CBD. While the IU treated PGR as the 'heritage of mankind', the CBD recognised national sovereignty over PGR, changing it from a fully global public good to one controlled by each nation state. This can be seen as a response to the increasing private ownership of previously

¹⁴ See Visser (2013) for a detailed description of the negotiations over which crops would be included in Annex 1

¹⁵ Halewood and Nnadozie (2008) reported that developed country delegations included private sector representation, and developed country negotiating teams consulted with relevant private actors in their countries. The private sector also participated directly in the negotiations, through the International Seed Federation

publicly-available seeds and knowledge. As the growth of biotechnology, and related IP regimes, restricted access to new seed technologies (primarily developed in the North) through cost, countries in the global South sought to restrict access to PGR by exerting the national sovereignty granted them by the CBD (Halewood et al., 2013). However, the CBD's approach to benefit-sharing, based on identifying the country of origin of the PGR used in a commercial product, was not applicable for food crops with high levels of interdependency (Halewood and Nnadozie, 2008). Negotiations over the scope of the MLS, and the terms of access and benefit-sharing, reflected this tension.

CGIAR's agreements with FAO had been based on treating PGR as a global public good, in line with the IU. In the renegotiation process, CGIAR sought to retain that approach as far as possible. This, paradoxically, meant its position aligned more closely with that of industrialised nations than that of low-income countries. GRPC stated:

“As a minimum, the CGIAR would look to the new IU to establish a Multilateral System covering the major mandate crops¹⁶ of the CGIAR centres.” (CGIAR GRPC, 2000b, p.3)

GRPC portrayed the genebank collections as “...the foundation of many CGIAR and NARS efforts to provide international public goods...” (ibid), and considered free movement of PGR to be vital to CGIAR's GPG role. It therefore sought to ensure wide scope and access terms, alongside legal clarity over the status of the genebank collections.

Terms of access, and forms of benefit-sharing were also contentious, and intertwined with negotiations on the scope of the MLS. Under the CBD, benefits were understood in terms of financial rewards from commercialisation, which should return directly to the providers of the resources. Under the IU, benefits from commercialisation were to be channelled into an international fund to support conservation programmes, but there was no direct link between the origin of the PGR used in the commercialised product, and the beneficiaries of funding for conservation programmes. Instead, biodiversity conservation was understood as a public good, with conservation work anywhere being assumed to be of benefit to everyone. Reflecting this multilateral approach, industrialised countries generally considered access to, and conservation of, PGR to be the main benefit of the MLS¹⁷, alongside the production of new seed varieties. Low-income countries wanted to realise the potential value of their PGR, and

¹⁶ See Appendix Four for a discussion of ‘mandate’ crops.

¹⁷ For instance, the European delegation stated its position in April 2000: “We see the Benefit Sharing arrangements largely as a way of providing Developing Countries and Countries with economies in transition with the means to utilise PGRFA in their own way through technology transfer, capacity building and information. But we also accept the principle that when PGRFA obtained under the Multilateral System results in commercial benefits, that those benefits would be shared.” (FAO, 2000)

therefore wanted a more direct form of benefit-sharing. They also wanted to keep potentially valuable crops out of the MLS, in order to be able to negotiate bilateral access arrangements alongside direct financial benefits.

Box 6.2 Farmers' Rights

The concept of Farmers' Rights was developed in the early 1980s, in response to the increasing application of Plant Breeders' Rights (PBR) (Andersen, 2005). It sought to ensure recognition of the role of farmers in cultivating and improving PGR used in modern crop breeding, alongside the role of scientists and breeders who had developed new seeds. It also sought to ensure that PBR did not limit farmers' customary freedoms to save, share and develop seeds, enabling them to continue to conserve and develop their crops.

The concept was debated in the FAO's CGRFA, which, in its second session in 1987, conceptualised Farmers' Rights as a collective right, and suggested mechanisms for implementation such as biodiversity conservation and seed improvement programmes. The idea of an international fund to pay for these mechanisms was also raised.

The concept was officially recognised in FAO in 1989, in a resolution added to the IU (5/89, FAO, 1989). A further resolution (3/91, FAO, 1991) agreed on the establishment of an international fund, but this did not materialise in practice.

While Farmers' Rights had been recognised, they had not been defined, nor any agreement reached on how to uphold them. "What they were rights to, who the rights holders were, and how the rights were to be maintained – these issues were not clarified." (Andersen, 2005 p.14)

The CBD (1993) formally recognised the value of Traditional Knowledge (TK) associated with genetic resources, but left the issue of Farmers' Rights to be determined through the renegotiation of the IU.

While the concept of Farmers' Rights developed in response to the spread of PBR, it is rooted in a conceptualisation of PGR management in which crop improvement is based on local, shared contextual knowledge, and biodiversity is intrinsically linked to local environmental and cultural contexts.

PBR, conversely, aim to grant ownership rights over PGR, based on a conceptualisation of PGR as having an economic value in global markets.

GRPC argued that CGIAR should be considered as a "...mechanism for benefit-sharing..." (CGIAR CDC, 2000b, p.20) through its activities, such as provision of improved seeds and capacity building, and called on CGIAR members to "...underscore access-related benefits associated with a Multilateral System..." (CGIAR GRPC, 2000b). CGIAR's position therefore aligned with that of most industrialised countries.

GRPC also took the position that the new IU should be legally binding (ibid).

A further topic under negotiation was the status of Farmers' Rights (see Box 6.2). GRPC did not put forward a position on this topic, but reported that, by March 2000, agreement had been reached that Farmers' Rights would be implemented at national level (ibid). Nonetheless, this remained a highly contentious issue in the renegotiation process (Correa, 2017) and CGIAR was later criticised for not taking a clear stance in favour of Farmers' Rights (see section 6.3.3.2).

6.3.1.2. Scope of the Multilateral System (MLS) for management of PGR

As negotiations continued, and it became apparent that the scope of the MLS would be limited, GRPC expressed concerns that crops excluded from the MLS would not receive future resources and research attention. GRPC reiterated its call for the inclusion of all crops held in CGIAR genebanks, including under-utilised species, and proposed that such crops be included in the MLS mechanisms even if they were not included in the new IU (CGIAR GRPC, 2000a).

GRPC was also concerned about access arrangement for countries and institutions that did not ratify the new agreement, and sought to maintain rights to distribute PGR held in CGIAR genebanks under the same terms as under the IU. GRPC argued that granting access only to countries that ratified the new IU would limit access to GPGs, and might put Centres in the position of not being able to share PGR with countries that had originally donated it.

By September 2000, the issue of the scope of the MLS was still unresolved.

“Regional proposals differ widely, with Africa proposing 9 crops, and Europe 287. The African, Asian, and Latin American proposals omit a number of crops with which CGIAR centers are currently working, a point which was viewed with great concern by the GRPC.” (ibid p.1)

As noted above, these widely divergent positions arose from political and economic considerations underpinning the negotiating process. Halewood and Nnadozie (2008, p.135) described these dynamics:

“One of the main drivers of the expanding and contracting size of the Annex 1 list was the constantly shifting expectations and positions taken by delegates concerning benefit-sharing. Many developing countries felt that, in the absence of appropriate and effective mechanisms for benefit-sharing, the Treaty would reinforce historic patterns of Northern exploitation and appropriation of Southern genetic resources without any benefits accruing to the South. They withheld consent or opposed inclusion in the hope of compelling the inclusion of stronger or more effective provisions for benefit-sharing.”

In this way, political considerations informed the negotiations, and shaped the final decisions regarding the scope of the MLS.

6.3.1.3. NGO perspectives

Despite CGIAR's position being similar to that of many Northern governments, there was also considerable agreement from NGOs such as Rural Advancement Foundation International (RAFI), which argued that including as many crops as possible in the MLS would best serve the interests of resource-poor farmers. (RAFI, 2001).

RAFI also highlighted the lack of funding commitments for implementing the Treaty, and argued in favour of the establishment of an endowment fund for key genebank collections (see Box 6.3).

On Farmers' Rights, RAFI argued that they should be recognised as an international human right.

This would mean that, while rights would be implemented through national legislation, countries could be held to account in a relevant international forum for their actions to uphold the

rights (ibid). This would mirror the treatment of Plant Breeders' Rights, which can be enforced on the basis of TRIPS Article 27.3(b) (Halewood and Nnadozie, 2008).

Box 6.3 Global Crop Diversity Trust

A topic under negotiation in the new IU was how conservation work would be funded. At the same time as those negotiations in 2000, the CGIAR Centres commissioned a study on the feasibility of setting up an endowment fund to support the genebanks. This was a separate initiative from the proposed fund under the auspices of the new IU.

The feasibility study recommended launching a fundraising campaign for an endowment fund, which would be used to support PGR conservation and to enable the design and development of a "...global genebank system." (Community Counselling Service Ltd, 2001, p.5)

GRPC was strongly in favour of the proposal, stressing the importance of such a funding stream to enable CGIAR to fulfil its obligations under the FAO-CGIAR agreements. The Trust funds would be used for upgrading the CGIAR genebanks and developing a global genebank system (CGIAR GRPC, 2000).

This approach put CGIAR's genebanks at the centre of the proposed global system. It also focused on *ex situ* conservation only.

By February 2002, the Trust was up and running, and had received its first funding (CGIAR GRPC, 2002), though its governance structure had not yet been agreed.

6.3.1.4. Responses to the International Treaty on Plant Genetic Resources for Food and Agriculture

The International Treaty on Plant Genetic Resources for Food and Agriculture – commonly known as the Seed Treaty – was adopted in November 2001, and established a multilateral system for sharing PGR of 64 crops (listed in its Annex 1) for conservation, breeding and research use for food and agriculture (Article 12.3 (a)) (FAO, 2009b). In the final negotiating session, several key crops were removed, meaning that the final list did not include important crops including soya bean, tomato, sugar cane, tea, coffee and cocoa. However, the list did include most of the crops on which CGIAR worked.

The MLS laid out the mechanisms for access and benefit-sharing, which applied only to the crops in Annex 1, and only to the signatories to the Seed Treaty (see Box 6.5). However, CGIAR continued to share all PGR in Centre genebanks under the same terms (Halewood et al., 2013).

Once the Seed Treaty was agreed, RAFI (now ETC Group) cautiously welcomed it, while highlighting the many issues still unresolved. In particular, they considered that Farmers' Rights were not adequately addressed, with the term itself remaining undefined in the Treaty. They also argued that rules on patenting were unclear and that many crops of importance to poor farmers were excluded (ETC Group, 2001), meaning that PBR or other forms of IP could potentially be granted over them in the future.

GRPC welcomed the Treaty, and

“...expressed its satisfaction that most of its earlier concerns...had been satisfactorily resolved in the final stages of the negotiations.” (CGIAR GRPC, 2002, p.2)

It highlighted the next steps needed, including ensuring all Centres understood the implications of the Treaty for their work, and developing an interim arrangement for sharing PGR until the Treaty came into force.

6.3.1.5. Conclusions on the Seed Treaty

As with all such international negotiations, the Treaty was a compromise between competing interests, specifically the multilateral approach of the IU and the bilateral approach of the CBD. CGIAR's interventions helped to ensure a larger number of crops were included in the MLS; led to agreement that crops already in CGIAR genebanks, but not included in Annex 1, could still be shared under the same terms; and countries not ratifying the Treaty could still access PGR held in CGIAR genebanks. These actions ensured the same levels of access to PGR as under the IU, enabling CGIAR to uphold its portrayal of its public good mandate.

CGIAR acted in these negotiations to maintain its role as providers of public goods, understood specifically to mean PGR held in its genebanks¹⁸, and the products arising from publicly-funded research i.e. the benefits to 'the public' provided by CGIAR research. This understanding of GPGs was uncontroversial, both within CGIAR and externally. However, this understanding of GPGs makes goods equally available to everyone, both public and private sector researchers and breeders. It takes no account of power dynamics between different actors in crop production systems. Additionally, there was little clarity about whether 'breeders' included farmers, and little clarity about the relationship between 'the public' and the intended beneficiaries of CGIAR's work.

¹⁸ Article 15 of the Seed Treaty applies to the genebank collections of CGIAR Centres and “other International Institutions”. Articles 15.1 to 15.4 relate specifically to CGIAR Centres, while 15.5 states that “The Governing Body will also seek to establish agreements for the purposes stated in this Article with other relevant international institutions.” (FAO, 2001)

CGIAR's focus on keeping as much PGR as possible in the public domain did not take into account the implications of that position on the effective functioning of the Seed Treaty's key mechanisms. Halewood et al. (2013) argued that the practical impact was to undermine the principles of reciprocity which underpin the MLS framework. Countries and institutions can access PGR from CGIAR without having to provide access to their own PGR, or contribute to the benefit-sharing mechanism, inadvertently enabling 'free-riding'. Not only does this reduce incentives for countries to ratify the Treaty, and share their PGR with others, but it makes countries that have signed the Seed Treaty unwilling to place their PGR in CGIAR genebanks, knowing that it could be shared with others who have not ratified the Treaty, and are therefore sidestepping responsibilities under it.

In addition, CGIAR's main concern was to clarify and protect the status of its genebank collections, and it championed a framing of PGR as global public goods which belong equally to everyone. In this context, it did not engage in debates about the relationship between PGR and Traditional Knowledge, or act to uphold Farmers' Rights. This approach undermined attempts to highlight the relevance of the development of PGR within specific ecosystems and cultural contexts; and the importance of those contexts for future PGR development.

CGIAR was generally satisfied with the terms of the Seed Treaty, because its role in an international PGR system was clearly laid out. However, the practical application of its role was still to be negotiated, and its mandate as a provider of GPGs was still poorly defined.

6.3.2. Governance issues

The agreement of the Seed Treaty affected CGIAR's position within global PGR governance frameworks. At the same time, internal debates continued about its research priorities and approach. The Third System Review (TSR), completed in 1998 (see section 6.2.2), identified Centre concerns that donor interest in the development impact of CGIAR's work was undermining the scientific quality of CGIAR's research output. The Chair of the Centre Directors' Committee (CDC) characterised the problem as a clash between two priorities:

“...the need to generate new and fundamental information (which usually means “upstream” research) and also have impact on international development (which usually means “downstream” research), creates a conflict for the Center programs. Donors may fund programs based on scientific standards set for generating new knowledge and understanding but generally evaluate accomplishments based on impact on international development.” (CGIAR SPC, 2000)

This perceived clash underpinned debate on the place of NRM in CGIAR's research portfolio, conceptualisations of its 'public goods' mandate and policy debate about IP. For instance, CGIAR's Chair argued that extended IP rights made it difficult for CGIAR to engage with 'cutting

edge' science because it could not "...access the toolkit of the new science..." while still making its "...output available to all". (CGIAR Secretariat, 1999, p.8)

In 2000, with the appointment of a new Chair (Ian Johnson), CGIAR's priorities and purpose changed significantly – at least rhetorically. The new Chair's first speech at ICW 2000 was notable for the shift in tone from a focus on science including biotechnology to a focus on environmental issues and how to use the best science to address poverty and development concerns.

The Chair identified several challenges facing CGIAR, including funding, effectively developing partnerships (including with farmers) and how to "...strengthen our position as producers of global public goods." (ibid p.9)

In 2001, the Change Design Management (CDM) process brought in some organisational changes:

- It established Challenge Programmes, which were issue-specific programmes bringing Centres together to work collectively on cross-cutting concerns.
- It set up an Executive Council (ExCo) delegated by CGIAR Members to take decisions in place of membership consensus decision-making
- It turned TAC into the Science Council, and removed its resource-allocation role
- It set up an administrative body, the CGIAR System Office, and introduced Business Meetings at CGIAR AGMs, establishing some of the practices of a formal organisation, but not the structure.

The changes introduced by the CDM process had limited impact on CGIAR's programmes; civil society actors remained critical of CGIAR's poor record on implementing participatory approaches and engaging farmers and NGOs (Gura, 2001).

6.3.3. Controversies over IP and PGR management

From 1999 to 2002, there was a series of sharp disputes between CGIAR and civil society groups. These focused on IP management, CGIAR's performance in serving the interests of poor farmers and the emergence of its pro-globalisation, private sector orientated responses to issues of PGR governance. These disputes eventually came to a head in 2002, when the NGOC decided it could no longer participate in CGIAR processes, and froze its engagement in CGIAR.

Debates in CGIAR, and the response of the NGO community and other actors to them, took place against the backdrop of changing dynamics in global negotiations. The primacy of the WTO over other negotiating bodies (and of trade rules over other international agreements)

was being challenged by countries of the global South and by NGOs from a wide range of sectors. The 1999 WTO trade negotiations in Seattle ended in collapse, while protesters against globalisation brought the city to a standstill (Vidal, 1999).

Negotiations at WTO over TRIPS were directly relevant to IP debates in CGIAR. In this context, NGOs may have seen revisions to CGIAR's IP policy as an attempt to comply with TRIPS rules which were being rejected by civil society actors elsewhere. Thus, although 'globalisation' was not an explicitly contested issue in policy debates within CGIAR in the late 1990s and early 2000s, it can be understood to have informed discourses shaping those debates.

As negotiations on the future governance of PGR continued, a group of NGOs (led by RAFI) kept a close watch on the actions of CGIAR Centres and repeatedly challenged them on IP and PGR management issues.

6.3.3.1. CIMMYT's new IP policy

In early 2000, CIMMYT amended its IP policy in favour of taking out patents where other options to protect their work were not considered viable. RAFI issued a statement criticising this position (RAFI, 2000b), arguing that other options to protect Centre research outputs existed, and that CIMMYT – and CGIAR Centres in general – were not competent to manage and monitor patents and their infringements. RAFI also argued that CGIAR's informal governance structure raised serious questions about its authority to decide on IP policies:

“...the CG Centres need to sort out who they are and to whom they answer before they gamble with the resources others have shared with them.” (RAFI, 2000b, p.5)

6.3.3.2. Global Forum on Agricultural Research (GFAR)

In May 2000, NGOs, CGIAR Centres, NARS, other research institutions and farmers' organisations came together in the first Global Forum on Agricultural Research (GFAR) meeting. Its purpose was to build partnerships across stakeholders in IAR, and it produced a final declaration (GFAR, 2000) which set out the shared vision agreed by participants.

Despite bringing all stakeholders together for the Forum, the GFAR meeting did little to reduce tensions and distrust. RAFI identified three reasons for this continuing distrust:

“...first, CSOs are not convinced of the potential for science to be a significant part of the answer to world hunger and inequity. Second, we are not convinced that the kind of science being pursued in the international public sector is useful to poor farmers. Third, we *are* convinced that international public science is incapable of managing public policy without intergovernmental oversight.” (RAFI, 2000a, p.4)

6.3.3.3. Revising IP policy at ICW 2000

In October 2000, the Centre Directors' Committee (CDC) proposed new guiding principles on IP. These built on the 1996 guiding principles, which were themselves controversial, and over which CGIAR members had not previously reached agreement (see section 6.2.4).

The 2000 draft guidelines stated that all Centre research should be considered to be GPGs but proposed extending the conditions under which Centres may decide to take out IP beyond those laid out in the 1996 Principles.

The 1996 guidelines stated that Centres would only seek IP protection for research products "...in those rare cases when this is needed to facilitate technology transfer or otherwise protect the interests of developing nations." (CGIAR GRPC, 1996, p.18)

The 2000 draft, however, stated that it might sometimes be "...a necessary or preferred..." option for Centres to take out IP, if

"...to do so would:

- a. support public and private partnerships which pursue mission-based research or which develop and apply research results;
- b. assure ready access by others to research products developed or funded by the Center;
- c. ensure the Center's ability to pursue its research without undue hindrance;
- d. facilitate the transfer of technology, research products and other benefits to the resource poor including, where appropriate, through commercialization or utilization of research products; and/or
- e. facilitate the negotiation and conclusion of agreements for access to proprietary technologies of use to the Center's research and in furtherance of its mission." (CGIAR GRPC, 2000a, p.15).

This represented a significant expansion of the occasions when Centres could consider taking out IP protection for their research products and a significant degree of discretionary authority for the Centres without external oversight.

Writing about the controversy later, a GRPC member, Carl-Gustaf Thornström, stated that the guidelines were a draft only and were intended for submission to FAO negotiations. But they were put on CGIAR's website in Oct 2000 and were taken, by RAFI and other NGOs, to be a unilateral decision to change CGIAR's IP principles, in breach of FAO-CGIAR agreements. While GRPC had recognised that the principles were contingent on the outcome of the IU renegotiation, RAFI accused CGIAR of pre-empting policy decisions, which should properly have been made in the FAO Commission on Genetic Resources for Food and Agriculture (CGRFA), and RAFI released a press statement highlighting their concerns.

In response, GRPC reiterated CGIAR's commitment to the production of GPGs, and its goals of reducing poverty, improving food security and protecting the environment (CGIAR GRPC, 2000a). It stated:

“The Committee disagrees with the expressed view that the CGIAR guidelines and centres' policies on IP “compromise public goods in favor of corporate interest” ...They have been formulated precisely to protect the interest of resource-poor farmers in developing countries by enhancing their access to technologies that otherwise will remain in the private domain.” (ibid p.8),

The GRPC considered that CGIAR provided public goods and was acting to protect their provision. But RAFI had a fundamentally different understanding of the concept of ‘public goods’. CGIAR's approach to IP protection failed to examine questions of who defined a ‘good’ and which publics could influence decision-making over mechanisms for accessing new technologies. Because of this failure to consider the impact of differential power between corporate actors and resource-poor farmers, RAFI and other NGOs considered that CGIAR was acting in ways which supported corporate interests.

The controversy over the draft guiding principles came to a head in ICW2000, though there is little indication in the public documentation of the extent of the controversy, or its potential seriousness. Information about events at ICW2000 has been derived from an unpublished account supplied by its author, who was a member of GRPC at the time (Thornström, 2002).

Meetings of the FAO CGRFA were scheduled for November 2000, at which negotiations on the IU would continue. The CGIAR's Chair was concerned that RAFI's accusations could derail negotiations, and trigger confrontation between countries of North and South. Therefore, CGIAR withdrew the proposed new IP guidelines and tasked GRPC with diffusing the tension, before the FAO Commission meeting. To this end, a series of side-meetings took place at ICW2000 between CDC and GRPC representatives, and representatives of RAFI, GRAIN, Via Campesina and Food First.

Both sides agreed that there were problems with:

“...the lack of clear boundaries and coherence among international agreements, conventions, and processes concerning genetic resources, technical transfer, and IPR.” (Thornström, 2002, p.5)

This was a highly political issue, particularly in the context of the renegotiation of the IU, and discussions at WTO on TRIPS. GRPC members were keenly aware of overstepping the mark.

Thornström reported that:

“The question of IPR and production of public goods within the CGIAR spilled directly over into the then FAO/IU's Article 14.2 (b) and (d), CBD's Articles 8j, 15, and 18–19

and, not least, into the ambiguities surrounding the Sui Generis alternative in WTO/TRIPS Article 27.3(b). It was scarcely the CGIAR's role...to have an opinion about processes which, in certain (not coordinated) fora, were negotiated by the same governments that finance CGIAR." (ibid)

CDC issued a statement, which reaffirmed Centres' commitment to the FAO-CGIAR agreements and stated explicitly that CGIAR could not unilaterally decide policies relating to designated PGR. It also recognised that FAO could not resolve the issue until the renegotiation of the IU was completed, and therefore Centres would continue to use the 1996 IP principles to guide their actions (CGIAR CDC, 2000a).

The statement diffused a potential crisis. But the result of this negotiation process was that nothing happened, and CGIAR's official records reflected this, with the Summary of Proceedings of ICW2000 merely recording that the CDC had decided to continue using the 1996 IP Guidelines.

Thornström observed:

"The CGIAR's annual meeting had some 500 participants, only a minority of which—perhaps a dozen—understood the magnitude of the confrontation that occurred and the negative consequences that could ensue if, at the upcoming negotiations in the FAO and CBD, the CGIAR were taken to be a tool for multinational firms in the North stealing the genetic resources and information of the South." (Thornström, 2002, p.5)

6.3.3.4. Possible transgenic contamination of maize in Mexico

Despite the joint statement issued at ICW2000, in early 2002 NGOs again challenged CGIAR, this time about its actions in response to

"...the possible introgression of transgenic DNA into farmer maize varieties/criollos cultivated in Mexico, which is in the primary centre of diversity for maize." (CGIAR GRPC, 2002, p.19)

The research identifying this contamination was published in November 2001 (Quist and Chapela, 2001). In response, ETC Group (formerly RAFI), backed by a statement from more than 140 farmer and civil society organisations, called on national governments and the seed industry to halt the movement of transgenic seed (ETC Group, 2002d). They also called for GRPC to act rapidly and present proposals to FAO and CBD to:

"...adopt proposals for the global monitoring of centres of diversity and key national and international gene banks." (ETC Group, 2002b, p.3)

GRPC decided that the evidence of contamination was not conclusive and that genebank accessions were unaffected. ETC Group accused GRPC of passing responsibility to FAO, CBD

and other UN bodies, and of failing to act in its self-proclaimed role of “scientific leadership” (ETC Group, 2002c, p.1).

The controversy, while ostensibly unrelated to CGIAR’s own work, reinforced civil society suspicions about CGIAR’s positioning in relation to corporate actors. The NGO Food First put events in the context of wider arguments:

“The controversy surrounding GM maize contamination in Mexico reflects a much larger conflict over control and stewardship of genetic resources in a world where biotech research is overwhelmingly dominated by corporate interests, and where public sector research increasingly serves the corporate agenda. ...the escape of engineered genes in Mexico demonstrates, once again, the inability of regulatory bodies or industry to control and contain genetically modified organisms.” (ETC Group, 2002a, p.2)

NGOs accused biotechnology companies of responding to the incident by starting “...a campaign to deny and discredit evidence of GM contamination in Mexico...” (ibid). In this context, GRPC’s failure to accept the evidence was seen as supporting the position of biotechnology proponents.

At a crucial moment in the renegotiation of the IU, NGOs saw CGIAR’s response to the maize contamination issue as supporting private sector interests rather than the interests of those it was mandated to serve.

6.3.3.5. CGIAR membership for Syngenta Foundation

Relations between NGOs and CGIAR further deteriorated when Syngenta Foundation was accepted as a member of CGIAR at the 2002 AGM, without any discussion. This was in line with CGIAR practice at the time which saw new members admitted by acclamation (CGIAR Secretariat, 2002a, p.36). However, it was too much for some members of the NGO Committee.

The NGOC presented a statement at the AGM and ceased its engagement in 2002. It stated:

“CGIAR is deviating from its mandate to produce public goods for the benefit of poor agricultural producers and to safeguard genetic resources taken from farmers' fields and held in public trust by the CGIAR gene banks, by adopting a corporate agenda for agricultural research and development. The consideration of Syngenta Foundation’s membership was one such instance as well as the quest for partnerships with the Private Sector, which undermine the public role of CGIAR.” (Bezanson et al., 2004, p.8)

6.3.3.6. The People’s Street Conference

The NGOC’s complaints were echoed by other civil society actors. At the same AGM, CGIAR was the target of street protests. The People’s Street Conference was a parallel event to CGIAR

AGM 2002, which critiqued it and the ARD model espoused by mainstream actors. It was specifically organised 'against' CGIAR and IRRI, led by Philippine farmers groups and CSOs (La Via Campesina, 2002).

This event produced a statement setting out its concerns about CGIAR's priorities and ways of working:

"The CGIAR...has consistently failed to meet the needs of poor farmers throughout the world. From the start of the Green Revolution, the research centers of the CGIAR have promoted a top-down, one-size-fits-all approach to research that ignores the knowledge and experience of farmers, farming communities, and indigenous people. The agriculture promoted by the CGIAR, with its dependence on pesticides, fertilizers and other chemicals, is environmentally and socially unsustainable." (ibid)

The statement highlighted concerns over:

- CGIAR's accountability "...to whom it claims to serve." i.e. farmers, rather than donors
- CGIAR's embracing of biotechnology and its management of PGR held 'in trust' for the public
- The status of IARCs which enable them to side-step national laws on workers' rights and protections, and
- CGIAR's failure to uphold farmers' rights and its partnerships with corporate actors.

In the AGM, CGIAR members discussed how to engage with a range of civil society actors, and the impact of the NGOC freezing its engagement. The Chair agreed that CGIAR's Executive Committee (ExCo) should examine "...how the CGIAR could best relate to NGOs and farmers' organizations..." alongside a review of all partnership mechanisms (CGIAR Secretariat, 2002a, p.36). This review was completed in 2004.

In the meantime (and subsequently) there were no formal mechanisms for CGIAR engagement with civil society actors, either at Centre level, or at the CGIAR System level, and no requirement in Centre or System governance structures for such engagement (I15/2).

6.3.4. Debates over CGIAR's role and GPG mandate

In the negotiations on the Seed Treaty, CGIAR positioned itself as central to global PGR management and in that role, as a provider of global public goods. At the same time, donor interest in the GPG concept was increasing, as globalisation processes highlighted connections between countries and the need for global action to address global development challenges, such as climate change. Donors were increasing their funding for global programmes (Lele and Gerrard, 2003). However, the definition of 'global public goods' was still being developed (Gerrard et al., 2001).

These external factors triggered internal debate about CGIAR's claims to produce GPGs. Internal factors also opened up debate. The Third System Review (TSR), completed in 1998, had raised questions about CGIAR's purpose and mandate. It questioned the approach of CGIAR's research, challenging it to both focus on upstream research and make sure their research reached, and was relevant to, small-scale farmers. This challenge started debate within CGIAR about the relevance of its work at different scales (local, national, regional, global) to its 'international public goods' mandate.

In response to questions raised by the TSR, CGIAR established a 'change design management' process. As part of this, TAC hosted two electronic consultations, one examining CGIAR's vision and strategy (RIMISP et al., 2000b), and one its governance and structure (RIMISP et al., 2000a).

These consultations highlighted the lack of agreement between stakeholders on what CGIAR should be doing and how.

Identified areas of agreement and disagreement are set out in Table 6.1. These positions represent a synthesis of views expressed by participants in the consultation. The authors of the synthesis reports did not attribute opinions to specific stakeholders and therefore it is not possible to identify which stakeholders held which views.

<i>Table 6.1 Stakeholder views on CGIAR vision and strategy 2000</i>	
Agreement	Disagreement
CGIAR doing too many different things	What it should be doing and what it should drop
Mission is "directly related to the eradication of poverty" (RIMISP et al., 2000b, p.2)	What that implied for what CGIAR should do. Suggestions included: <ul style="list-style-type: none"> - increasing productivity to increase food availability to urban and rural poor- implying crop development work - working on pro-poor technologies for farmers not served by private actors – implying NRM and context-specific crop development work - working to enable small-scale farmers to participate in markets; and working on policy barriers.
Important for CGIAR to form partnerships and alliances	Who with and to do what? Suggestions included: <ul style="list-style-type: none"> - continue to work with NARS

	<ul style="list-style-type: none"> - develop public-private partnerships (PPPs) - work with development organisations to focus on poverty reduction.
Environmental protection is part of CGIAR's mandate, particularly NRM to improve production	CGIAR's mandate is to produce GPGs, but NRM usually entails local actions, which do not produce GPGs.

The consultation on governance and structure revealed a fundamental clash between different understandings of CGIAR's role and purpose. Participants saw a clear distinction between poverty reduction and NRM work on one side and PGR management and GPG production on the other. They questioned whether CGIAR structures could support both; and whether poverty reduction work met CGIAR's mandate to produce GPGs.

The two areas of work required different ways of working and relationships with distinct groups of actors. PGR management work involved building relationships with private sector actors, advanced research institutions and others working within an IP framework in the global market; while poverty reduction and NRM work required partnerships with NGOs, NARS and farmers' groups, with whom CGIAR had not previously worked. CGIAR had limited capacity to influence the former group; and limited skills and inappropriate internal structures to work with the latter (RIMISP et al., 2000a, p.5).

"During the debate it became clear that managing genetic resources and erradicating [sic] poverty are not easily compatible objectives from the point of view of structure, organization and governance." (ibid p.1)

These debates laid bare a clash between the goal of poverty reduction and the goal of producing IPGs; and highlighted institutional barriers to CGIAR doing both.

CGIAR, alongside other actors in the development sector, was striving to define GPGs, and how to define its role in providing them. For some participants in the debate, high quality science produced by CGIAR was, in itself, a GPG. For that reason, they argued, CGIAR should focus on producing peer-reviewed science; however participatory research, which was not conducted according to formal scientific procedures, could not be considered a GPG. Others argued that science must be relevant to farmers to contribute 'goods' i.e. social benefits. Again, the question centred on how CGIAR's GPG mandate should be understood: should CGIAR create GPGs, defined in a limited economic sense? Or was such a focus stopping CGIAR from producing research addressing the more broadly-defined GPG of reducing poverty?

The consultation report framed the choice as:

“Safeguarding the position of the CG as an institution tightly focused on providing well defined international public goods, with a strong emphasis on basic and strategic research, or moving closer to embedding the CG’s functions within broader and more comprehensive development efforts?” (ibid p.15)

Those favouring the latter acknowledged that it would require shaping research priorities to fit political decisions about development strategies, a shift which challenged CGIAR’s core commitment to being ‘apolitical’. It would also require “...greater involvement and participation in decision making for a broader set of stakeholders and end users of technology...” (ibid p.16) reducing scientists’ power over deciding research priorities.

Thus, taking a broader definition of GPGs entailed challenging some of CGIAR’s core narratives about itself.

ICW2000 took place in the middle of the change process (which concluded in 2001). The meeting focused on organisational change and included a seminar on GPGs (CGIAR Secretariat, 2000). CGIAR stakeholders presented their perspectives.

Robert Picciotto, the head of the World Bank’s evaluation arm, described the Bank’s position. It considered provision of GPGs to be necessary to counter the uneven impacts of globalisation. It was therefore increasing its funding to global programmes to uphold its commitment to making “...globalization work for all...” (Picciotto, 2000, p.2).

He announced an evaluation aimed at examining the effectiveness of the 97 “...global public goods programs supported by the Bank...” (ibid p.4) including CGIAR, which at that point received around 30% of Bank global funds. In the context of new demands for global-level programming, Picciotto directly challenged CGIAR to justify Bank funding, by asking:

“Is the CGIAR producing global goods? The answer is far from obvious.” (ibid p.6)

Again, the answer depended on how GPGs were understood. Picciotto suggested that, while agricultural research generally takes place at a local or national level, it can produce global benefits, such as reduced poverty. Thus, he defined GPGs both in the narrow economic sense, and more broadly as societal benefits.

He then asked whether CGIAR should only produce pure public goods, or should produce ‘club goods’ from which it might generate revenue. He advised CGIAR to do both:

“This may require a restructuring of the CGIAR towards the twin objectives of engaging the private sector and making globalization work for all.” (ibid p.7)

WB Vice-President Motoo Kusakabe focused on the question of how to pay for GPG provision. He highlighted the increase in privately funded and produced agricultural research, and argued that CGIAR should find ways to draw private funding into research addressing GPGs. He suggested building public-private partnerships (PPPs). This would imply ensuring “...at least a degree of excludability...” for CGIAR’s research outputs (Kusakabe, 2000, p.2). In effect, he argued that CGIAR should make its research of more interest to the private sector to draw in their funds.

As one of CGIAR’s co-sponsors, the Bank was highly influential. CGIAR’s Chair (Ian Johnson) echoed this position, describing CGIAR’s role in filling gaps left by market under-provision of public goods i.e. goods needed by society or research outputs needed by the poor.

“We must therefore find new and creative ways of working with the private sector.”
(CGIAR Secretariat, 2000, p.10)

However, he also stressed the importance of working with farmers “...to identify research that is needed at the local level.” (ibid)

Similar views were expressed by the head of EMBRAPA and the head of IFPRI. In addition, they highlighted the importance of IP in creating incentives for private sector engagement in GPG production. They argued that IP was necessary either to provide Centres with ‘bargaining chips’ to use in their negotiations with private actors; or to provide private actors with ‘a degree of excludability’ on research outputs from PPPs.

The Chair of the PSC, Sam Dryden, argued that the private sector “...serves the public good...” (ibid p.24) by creating wealth i.e. through economic development. He blurred the distinction between ‘the public good’ and ‘public goods’, except in relation to “...genetically improved goods...”, which were the focus of his concerns.

He stated that a new relationship required public sector respect for private “...rights of ownership...” in return for private sector recognition of its “...broader social obligations.” (ibid p.25) However, he did not provide any guidance on how they might be held to account regarding meeting those obligations.

Conversely, Ann Waters-Bayer, from the NGOC, stressed the role of public research bodies in meeting the needs of those not served by the market, and of addressing social concerns. Public research should “...go beyond new technologies and methods...” (Waters-Bayer, 2000, p.3) to include “...research on socio-economic, institutional, legal and policy issues in support of the disadvantaged...” (ibid).

She highlighted the difference between pure and impure public goods, describing knowledge “...packaged in material form...” (e.g. seeds) as an impure good because it could be privatised (ibid p.1). She argued that where such goods were needed to provide a public good such as improved health, they should remain in the public domain. She also drew attention to the role of farmers and other informal actors in producing public knowledge and called for strategies to ensure it remained in the public domain.

“Ways must be sought to protect small-scale farmers from being robbed of the results of their own experimentation and innovation.” (ibid p.3)

The debate about CGIAR’s GPG role was shaped by funding needs. CGIAR’s Chair thought that increased donor interest in GPGs could be an opportunity for CGIAR; while advocates of PPPs called for CGIAR to reshape its GPG mandate to attract new – private sector – funding.

Participants in the debate variously called for CGIAR to act to:

- Retain WB funding
- Retain funding from government development ministries
- Establish PPPs to attract PS partnership funding
- Engage with PS to attract new philanthropic funders

Table 6.2 summarises the positions of the key actors at ICW2000.

<i>Table 6.2 Stakeholder positions on GPGs 2000</i>				
Actors	Narratives			GPG interpretations
	Problems	Factors	Proposed solutions	
World Bank	Poor countries unable to participate in global economy; “instabilities” and “inequities” associated with globalisation	WB must act to mitigate these impacts	WB increasing funding to global programmes; CGIAR should work with private sector, produce GPGs within context of globalisation project	Goods in economic sense, and broader societal benefits.
PSC	PS needs to protect its research products CGIAR needs access to technology produced by private actors	CGIAR needs to adhere to IP regimes to partner with private actors Public goods mandate is a barrier to PPPs	Change public goods mandate	Goods in economic sense, and undefined social responsibility to address ‘the public good’
CGIAR Chair (Ian Johnson)	Private sector does not provide services and technologies needed by / relevant to poor farmers Research products must remain in global public domain	CG should work with PS to increase its engagement with the needs of poor farmers. Actions to address poverty take place at local level, working with farmers	CG should use PGR in genebanks as ‘bargaining chips’ to persuade PS into partnerships CG role in taking local and regional needs to global level	Knowledge as public good
EMBRAPA, IFPRI	Private sector does not provide services and technologies needed by / relevant to poor farmers	CGIAR should act to support globalisation processes PPPs in AR	IP needed to incentivise PS engagement in PPPs	

NGOC	Private sector does not provide services and technologies needed by / relevant to poor farmers Farmers' innovation not adequately recognised		Public IAR must meet needs of poor farmers not provided by market, including socio-economic research and research on global issues. Public bodies must protect and maintain public access to public knowledge	Goods in economic sense, and broader societal benefits.
Other participants in e-conferences	Private sector is key actor in crop development	Market increasingly operating at global level CGIAR can't influence global changes	CGIAR should work with market actors	

6.3.5. Conclusion: 1999 – 2002

From 1999 to 2001, CGIAR's policy work on PGR was focused on the IU negotiations, which led to the agreement of the Seed Treaty in 2001. Contrasting understandings of the economic, environmental and social value of PGR informed the positions of actors engaged in renegotiating the IU, and shaped debates within CGIAR about its approach to IP and to its GPG mandate.

In one view, PGR was considered to be the 'heritage of mankind', a global public good that should be freely accessible to, and exchangeable between, researchers and breeders internationally. This view restated CGIAR's founding narrative. It was supported by FAO and many industrialised nations whose seed industries benefited from free access to PGR. An alternative view saw PGR as a national public good, implying that nation states should have control over its use and exchange, and should benefit from the commercialisation of products arising from its use. This view was embodied in the CBD, and upheld by many biodiversity-rich

countries in the global South. Both perspectives focused on PGR as a commodity with potential economic value.

These contrasting perspectives informed controversies over CGIAR's IP policy development (section 6.3.3). Proponents of free international exchange of PGR for crop breeding often also argued for IP control over the resulting research products i.e. new seed varieties. They argued that this was necessary for commercialisation, to ensure such products reached farmers. They also considered IP could be a useful tool to maintain research outputs in the public domain. An alternative view held that the expansion of IP favoured corporate actors and reduced poor farmers' access to seeds, while simultaneously expecting them to relinquish control over their farmer varieties. In this view CGIAR, as the custodian of PGR which belonged to all, did not have the authority to make decisions about which PGR should be freely available, and which should be covered by IP rules.

Issues of the ownership and control of PGR also fuelled debates about CGIAR's GPG mandate (section 6.3.4). Stakeholders within CGIAR held diverging views on the most effective way to address the needs of poor farmers in LICs. In one view, CGIAR should focus on producing high quality science through its crop breeding work. They considered such research outputs to be uncontroversially GPGs. To do this required access to PGR and to proprietary technology. An alternative view argued that CGIAR should develop pro-poor technologies for farmers not served by markets. For instance, NGOs such as RAFI argued that CGIAR did not produce science that was relevant to the needs of poor farmers. Proponents of expanding CGIAR's work on NRM and biodiversity conservation saw such work as addressing its mandate to reduce poverty, and thus producing GPG outcomes. However, others argued that such work did not produce GPG outputs. In this debate over alternative conceptualisation of GPGs, reducing poverty and managing PGRs were framed as being in conflict with each other.

The GPG mandate was also challenged in debates about IP policy and how CGIAR's work should fit into changing global markets. Proponents of the view that CGIAR should produce international science argued that expanding IP was necessary to build partnerships with private actors. In the context of globalisation, as private actors extended their reach in IAR, such partnerships were necessary for CGIAR to produce cutting edge science and deliver research products to farmers. In this view, even though IP mechanisms limited access to technologies, their use did not undermine CGIAR's GPG mandate. The World Bank (WB) further argued that CGIAR had a responsibility to produce GPGs to mitigate negative impacts of globalisation processes; and to do so through working with PS actors.

Thus, contestations over narratives about CGIAR's GPG role, its role in PGR governance and its policy directions on IP were intertwined and difficult to untangle. Questions about the use, ownership and control of PGR informed debates about how CGIAR's GPG mandate should be understood, and what different understandings implied for its research directions. These interlinked clashes of narratives underlined radically different political perspectives, which can be broadly characterised as pro- or anti-globalisation. In this clash, actors such as WTO, WB, FAO and many of CGIAR's key donors were in favour of market-led approaches to development as a means to reduce poverty. Other actors, such as many NGOs and several countries in the global South, drew attention to negative impacts of globalisation processes on poor communities. Tensions, and rising distrust, between stakeholders in CGIAR reflected these wider contestations.

In this context, CGIAR chose to align itself with its major donors. CGIAR sought to reframe its GPG mandate to fit with the WB's globalisation agenda. Despite the comprehensive stakeholder consultation that informed debate at ICW 2000, none of the participants in that debate challenged the World Bank's assertion that globalisation was inevitable. The potential costs of globalisation, particularly for LICs and marginalised populations within them, were recognised, but the Bank called for actions to mitigate them. Directionality issues were not considered (see section 4.2.2.6); they were conspicuous by their absence.

CGIAR's institutional interests were best-served by this position. The WB had backed up its view with a threat to reduce funding to CGIAR. It also raised the possibility of funding from PS sources if CGIAR changed its approach. The WB position was also supported by powerful voices including the PSC and CGIAR's Chair. Additionally, globalisation models fitted with CGIAR's founding narratives about its role as a provider of internationally-relevant science. Similarly, models of PGR management predicated on its free exchange fitted with CGIAR's interests in retaining access to resources for its crop breeding research. CGIAR therefore aligned itself with the prevailing dominant discourse and in doing so, upheld its claims to be apolitical.

As a result, CGIAR maintained its positions in favour of keeping PGR in the public domain, while simultaneously seeking to expand IP rules affecting its own research products. However, debates about how to define GPGs, and whether CGIAR produced them, raised new questions about what sorts of research CGIAR should be conducting, what sort of outputs it should deliver, and to whom; and how much CGIAR research should be embedded in development strategies. Discussion about CGIAR's role brought to the fore broader questions about the relationship between scientific research and development impact, and about which groups in society benefitted from CGIAR's research outputs.

CGIAR's internal debates about the meanings and implications of a GPG mandate were not resolved in 2000. Internal debate about CGIAR's GPG mandate continued over the following years, informing the next reform process which began in 2007. This is examined in Chapter Seven.

6.4. 2002 – 2007

From 2002 to 2007, CGIAR's work on PGR management focused on developing mechanisms to implement the Seed Treaty. While this was a complex technical matter for CGIAR it also had major policy implications. These included agreeing information management systems for PGR held in CGIAR Centre genebanks, agreeing new conditions for third party access to PGR to protect the principles of open access, and developing a comprehensive IP policy. CGIAR's policy processes during this time were also influenced by the impact of globalisation processes and the agreement of the Millennium Development Goals, which provided a global focus on poverty reduction. In this context, CGIAR donors raised questions about the relationship between research and development. This led, yet again, to an intense period of policy review and reform for CGIAR, which encompassed debates about its governance, its relations with different stakeholders, its purpose and particularly the meaning of its global public goods (GPG) mandate.

Additionally, as private sector actors increased their investment in agricultural research, CGIAR had to demonstrate its relevance to donors' development agendas i.e. what CGIAR provided that private sector actors could not. Debates about its role, purpose and research priorities were thus crucial to its ability to maintain its funding and its position in the global IAR system.

Debate about what GPGs were, whether CGIAR produced them and whether it should produce them, became the location for contestation about what kind of work CGIAR should undertake, how and with whom. This section of the chapter sets out those debates and demonstrates how organisational decisions created structures that reinforced specific approaches to core concepts, like 'public goods' and 'research for development'.

6.4.1. The Seed Treaty

The Seed Treaty, adopted in 2001, created a new regulatory regime, but the details of how it would be implemented were still to be agreed; and its relationship to existing regimes such as CBD and WIPO had to be negotiated. As discussed in section 2.7.3, contradictions between regimes are often managed through lengthy post-agreement negotiations to work out what

rules mean in practice. These are often conducted in technical committees, thus depoliticising decisions which may have far-reaching policy implications.

Box 6.4 The Seed Treaty

The Seed Treaty established a multilateral system (MLS) for sharing PGR of 64 crops (listed in Annex 1 of the Treaty) for conservation, breeding and research use for food and agriculture (Article 12.3 (a)). It recognises Farmers' Rights at national level (in Article 9) and aims to establish a mechanism for sharing the benefits of commercialisation of products developed from PGR accessed through the MLS.

The MLS

- applies only to the 64 crops listed in Annex 1
- is applicable only to national governments: other holders of relevant PGR are invited to place their collections in the MLS
- allows access to PGR through the system, for research, breeding and training purposes only and excludes non-food related uses
- provides for free (or cost-only) access to Annex 1 PGR to researchers or breeders
- provides for access according to a Standard Material Transfer Agreement (SMTA) which means that the terms of access (and associated terms of benefit-sharing) do not have to be negotiated bilaterally for each separate transfer.
- is a reciprocal system, so that only signatories to the Treaty can gain access; private actors wanting to access PGR through the MLS would be expected to make their own collections available to researchers and breeders on similar terms

A second pillar of the Treaty is benefit-sharing, which covers information exchange, technology transfer, capacity building and financial benefits from commercialisation (Article 13). Recipients who successfully commercialise a product made from PGR received under the MLS should contribute to an international fund which will finance PGR conservation and other actions under the FAO's Global Plan of Action.

Article 15 concerns the *ex situ* collections held primarily by CGIAR Centres. It calls for CGIAR (and others) to put their relevant PGR (i.e. the 64 crops) under the auspices of the Treaty. The terms of transfer for other PGR held in genebanks and collected before the Treaty came into force, would be the subject of future agreements. PGR collected after the Treaty came into force would be subject to the terms of the CBD (Article 15.3)

Article 17 calls for the development of a global information system, to map PGR held in genebanks. The purpose was to improve coordination between existing information systems run by CGIAR Centres and other research institutions.

6.4.1.1. Implementation of Seed Treaty

Staff from the System-wide Genetic Resources Programme (SGRP) represented CGIAR in negotiations with FAO, and in regular technical meetings with CBD and WIPO bodies (SGRP, 2004); negotiations over Seed Treaty implementation took place at programme level, even though technical decisions had important policy implications affecting the future of PGR management.

SGRP operated under the policy guidance of GRPC. GRPC's work focused for several years on Treaty implementation issues, and internal CGIAR discussion about related policy directions

took place in GRPC meetings. Details of Seed Treaty negotiations were not discussed by CGIAR's Executive Committee (ExCo) or by Members. Nonetheless, CGIAR played a critical role in the process, both as subject and participant, influencing decisions about Treaty implementation.

Implementation issues included:

- Centre agreements with the Treaty Governing Body
- Agreeing a Standard Material Transfer Agreement (SMTA) for Annex 1 crops
- Terms of transfer of, and access to, non-Annex 1 crops.
- Terms of transfer of genetic material to non-signatories to the Treaty
- Handling of products of CGIAR research, which were not automatically covered by SMTAs
- Access and Benefit Sharing terms (also a concern of the CBD)
- Management of Traditional Knowledge (TK) (also relevant to WIPO's work)
- Centres' work to promote farmers' rights
- Centres' "...non-monetary benefit sharing through technology transfers..." (CGIAR GRPC, 2004a)

Some of these issues also fell under other regulatory regimes or had implications for policy in other areas, and were dealt with concurrently in other bodies in the regime complex. For instance, GRPC also had policy oversight for:

- IP issues (closely linked to debates about the terms of the SMTA, terms of ABS, handling of TK and handling of products of CGIAR research)
- Funding strategies i.e. the development of the Global Crop Diversity Trust (CGIAR GRPC, 2005b)
- Standards of genebank management and PGR conservation, including plans for long-term seed storage at Svalbard (CGIAR GRPC, 2004b). These had implications for IP and TK.

GRPC's position in negotiating Treaty implementation mechanisms was the same as its position during negotiations on the Treaty: to keep as much PGR as possible freely available and to keep terms of transfer of PGR as similar as possible to those before the Treaty was signed. However, the Seed Treaty created different categories of PGR - Annex 1, non-Annex 1, material received from a country that had (or had not) ratified the Seed Treaty, material received before (or after) the passing of the CBD, material for which the country of origin was not known, material that was the result of Centre research activities etc. Negotiations aimed

to reach agreement on how to treat these different categories of material. This required improved record-keeping at genebanks so that the status of PGR relative to the rules of the Treaty were publicly available. Thus, a direct consequence of the adoption of the Seed Treaty was a change in the management and sharing of information about PGR held in genebanks. The implications of this shift are discussed below (section 6.4.5).

In line with its position on keeping all PGR freely available (and because of uncertainty over what PGR fell into which category), GRPC recommended that Centres should treat all different categories of material according to the Treaty terms:

“...Centres should apply the provisions of the Treaty in every possible circumstance, and thus avoid placing themselves in the position of interpreting the Treaty in regards to if or when its provisions might apply legally.” (CGIAR GRPC, 2004b, p.4)

Therefore, despite the political manoeuvrings which led to the identification of 64 crops to be covered by the Treaty (see section 6.3.4.2), CGIAR decided to implement the same terms of exchange for all crops in Centre genebanks, thus undermining the distinct status of Annex 1 crops, and undermining the political agreements reached through the negotiations. Similarly, GRPC argued for the same conditions for transfer of materials to countries which had not ratified the Treaty (CGIAR GRPC, 2005a).

Technical discussions about the terms of distribution of PGR did not consider questions about who to distribute PGR to, or what they would use it for. CGIAR endeavoured to enact its public goods mandate by working to maintain access to PGR for researchers and plant breeders, and made no distinction between public and private sector recipients. The end results of research on material accessed from the MLS was not part of CGIAR’s deliberations.

6.4.1.2. Intellectual Property and the Seed Treaty

Article 13.2(d) of the Seed Treaty requires

“...a recipient who commercializes a product...that incorporates material accessed from the Multilateral System [to] pay...an equitable share of the benefits arising from the commercialization of that product...”

Therefore, payments to the MLS were dependent on the commercialisation of seed varieties, which in turn depended on IP restrictions. In this way, implementation of the Seed Treaty was closely linked to IP management. For CGIAR policy on PGR management to comply with the Seed Treaty required the development of a comprehensive IP policy, and discussions about Centre management of IP took place concurrently with debates about Treaty implementation mechanisms.

Negotiations on Treaty implementation sought to reach agreement on definitions of key terms. For instance, by August 2005, negotiations were still ongoing over

“...the definitions to be given to the terms “products”, “incorporation” and “commercialisation” in triggering benefit-sharing under the Multilateral System.” (CGIAR GRPC, 2005a, p.6)

In the light of this lack of clarity, GRPC sought to ensure consistency across Centres’ IP policies and produced new draft IP guidelines (see section 6.4.6).

The Seed Treaty provides for benefit-sharing on a multilateral basis, operating on the principle that benefits should flow “...to farmers of all countries, rather than on a bilateral basis to an individual provider.” (CGIAR GRPC, 2005a, p.4). While this approach enables the free flow of PGR, it reinforces a framing of PGR as an international object, its place of origin irrelevant. It makes invisible the farmers who originally grew it. However, IP rules provide for direct benefits to a specific owner. These contradictory principles had to be balanced, by deciding which regulatory regime applied to which specific PGR.

CGIAR argued for keeping PGR in its genebanks freely available, while accepting the logic of a regime that put private ownership and commercialisation at its centre. For instance, under this logic, GRPC considered ethical concerns regarding Centres’ handling of

“a) potentially confidential knowledge they develop in private sector partnerships and b) traditional knowledge they access and use.” (ibid p.2)

However, while the draft IP guidelines set out suggested principles for managing the former, GRPC acknowledged that the existing CGIAR Statement of Ethical Principles, dating from 1999, did not include consideration of TK (see box 6.5).

The Governing Body of the Seed Treaty met for the first time in June 2006 and approved the SMTA, the model agreements between IARCs and other organisations holding PGR, signed an agreement with GCDT and approved a financial strategy (CGIAR GRPC, 2006b).

Box 6.5 Traditional Knowledge (TK)

The ratification of the Seed Treaty added a new regime to the international regulatory framework affecting PGR and IP, traditional knowledge (TK) and access and benefit sharing (ABS). The regime complex consisted of the Seed Treaty, CBD, WTO rules and WIPO (see Chapter Two). TK was covered in all these international agreements.

The CBD (1993) included articles aimed at ensuring that TK was respected. Article 8(j) required the sharing of any benefits "...arising out of the use of the traditional knowledge, innovations and practices..." with the communities from where such knowledge originated (Blakeney, 2003, p.2).

TK was discussed within the WTO TRIPS negotiations, but when the WTO Doha Round stalled, negotiations over the relationship between TK and IP shifted to WIPO.

In 2001, the first session of WIPO's Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore (IGC) was held. The IGC considered:

"...intellectual property issues that arise in the context of (i) access to genetic resources and benefit sharing; (ii) protection of traditional knowledge, whether or not associated with those resources; and (iii) the protection of expressions of folklore." (ibid p.7)

However, IP approaches may not be appropriate for protecting TK for practical reasons. Identifying TK as 'prior art', which could be recognised by patent offices, requires writing down and making public knowledge that may only exist in oral form and only within one community. "This requires the codification and fixation of traditional knowledge into what it is not." (ibid p.10).

Some features of PGR and TK meant they do not easily fit into formal IP regimes e.g.:

- The concept of common heritage or community ownership rather than individual ownership
- The evolution of both TK and plant varieties through the interventions of many people, often across generations i.e. innovations or new art are not the work of one person
- They "...cut across a range of formal and informal innovations and creative situations." (Gupta, 2004, p.18)

The IGC sought to identify ways to protect TK. Suggested solutions included creating a database of TK related to GR; and developing Material Transfer Agreements which included recognition of TK associated with the PGR being transferred.

CGIAR had to consider how to respect TK as it developed mechanisms for the distribution of PGR under the Seed Treaty. Implementing the Seed Treaty also required CGIAR to develop new information management systems, providing information about the PGR in their collections. This included information acquired from communities from which seeds were originally collected. To protect this information, CGIAR signed an agreement with WIPO linking its PGR database to WIPO's database on TK, to enable "...national patent offices' prior art searches." (SGRP 2004, p.2)

It also developed guidelines for Centres on obtaining and using TK. These were agreed in 2008.

However, by November 2007, little progress had been made in international negotiations on key issues such as ABS or the handling of TK (CGIAR GRPC, 2007).

6.4.2. Governance issues

CGIAR introduced a new organisational structure in 2001 (see section 6.3.2). This sought to address management and governance issues but left the core principles of donor sovereignty and Centre autonomy intact, and contestation about CGIAR's purpose and remit continued. Debates about the types of work CGIAR should do were entangled with arguments about organisational structure and management, which in turn were informed by funding concerns.

The new organisational structure established an Executive Council (Exco), replaced TAC with a Science Council (SC), established Challenge Programmes (CPs) and created a central System Office. These changes altered relationships between the Centres and the System; and between members and the System.

The changes sought to address concerns identified through internal consultation, including effective partnership working, accountability, financial stability and the quality and focus of CGIAR's research. Underpinning the process was a concern about funding. CGIAR's institutional incoherence and poor governance had led donors increasingly to choose to fund specific programmes, rather than funding the CGIAR System and trusting TAC to disperse funds. At the same time, the World Bank considered CGIAR to be focusing too much on what it considered 'development' (rather than research) work – often as a result of donor interests and pressures. The architects of the new structure considered this an existential threat:

“The greatest fear, of course, was that inaction might cause the CGIAR to lose its anchor — the World Bank's continuing leadership and financial support.”
(Reifschneider et al., 2007, p.5)

In 2003, the World Bank commissioned what it termed a 'meta-evaluation', examining CGIAR at System level through a review of previous reviews and evaluations (World Bank, 2003). This evaluation was critical of the limited reforms undertaken in 2001, and highlighted the lack of alignment between the work of different Centres, and between Centre priorities and those of the countries in which they worked. The evaluation called on CGIAR to refocus its work on productivity-enhancing research, rather than NRM. Other donors disagreed strongly, considering NRM to be an important approach to increasing productivity, especially in marginal areas (CGIAR Secretariat, 2003). Discussion about the outcomes of the World Bank's evaluation illustrated the depths of disagreement and disappointment at the state of CGIAR, its management, and the need for much greater change to turn it into an organisation that deserved donor backing. The Rockefeller Foundation representative:

“...argued that the reforms conducted by the CGIAR over the last decade have not gone far enough. The key question is, if the CGIAR was being created today, would the \$350 million be spent and the System structured the way it is now?” (ibid p.14)

Implementing the new structure resulted in a period of continuous reform from 2001-2007. However, because form and function were so closely entwined, doing so involved much discussion about CGIAR's purpose and place in the IAR world. A struggle for control between Centres, the System and donors over the future direction of CGIAR's work was played out in contestation over governance structures.

6.4.2.1. Relations between Centres and System bodies

As the reforms were introduced, tensions between Centres and the System Secretariat grew. Centres felt that their autonomy was being undermined by actions taken by the Secretariat and donors to control the work and management of Centres.

For instance, one of ExCo's first tasks was to examine Centre governance. Several Centre reviews had highlighted poor financial management, Centre Board members lacking governance experience and a lack of transparency in choosing Board members (CGIAR Secretariat, 2002b). A governance and funding crisis at CIMMYT (CGIAR Secretariat, 2005b) demonstrated the failure of the System to maintain oversight of Centre management, and exacerbated donor reluctance to provide unrestricted funding. Some donors questioned whether the principles of Centre autonomy and informal central governance were still fit for purpose and requested greater control over Centre governance (CGIAR Secretariat, 2004).

For their part, Centres were concerned that the Challenge Programmes (decided centrally – see section 6.4.5.3) would reduce funding available for priorities decided by Centres. They were also concerned by the influence of donors over Centre programmes:

“...as seen by the strong growth in special programme funding at the expense of core funding, donors obviously have strong wishes for what Centres should be doing and there is little commonality between donors' expectations.” (CGIAR Science Council, 2004b, p.xxii)

This debate was one location of a struggle for power between Centre scientists and System managers. Centres were generally against the changes introduced, and felt that their position, and the role of scientific expertise had been reduced in the new structure (CGIAR CDC and CGIAR CBC, 2003).

A further source of tension between Centres and the System was over ExCo's attempts to create greater programmatic and structural coherence (called 'alignment') across the Centres. Two Task Forces were set up to examine alignment across CGIAR, starting with Sub-Saharan Africa. They identified problems including disconnects between CGIAR centre research and NARS priorities, duplication of work, uncoordinated projects, overlap of mandates and locations; and poor working with other Centres and other IAR actors (I3; CGIAR Task Force on Sub-Saharan Africa (2005).

The Task Forces concluded that “...the core of the problem is structural...” and recommended consolidation of “...all CGIAR Centers and activities into one global corporate entity.” (ibid)

Implementation of the Seed Treaty also required increased coordination between Centres to ensure System-wide standards and procedures. All Centres had to manage their PGR collections in the same way, in line with the terms of the Treaty; and they had to accept the authority of the Treaty Governing Body on policy issues relating to their collections (Article 15.1(c)). These factors contributed to a process of reducing the autonomy of Centres – and perhaps their power – within the System.

The Centres responded by developing their own plans for an alliance which would give them a unified voice in dealing with the Secretariat (CGIAR CDC and CGIAR CBC, 2003, p.10). This was formally established by the end of 2004 (CGIAR Alliance Office, 2005).

The Secretariat also sought greater alignment over funding. The development of System Priorities was an attempt to gain agreement between donors on what to fund. The intention was to create a mechanism to ensure all CGIAR's work was funded, rather than donors choosing their favourite areas of work. The Secretariat was also concerned to maintain control over CGIAR's overall research portfolio, and considered that setting System Priorities would put boundaries on the potential influence of any one donor:

“The goal is to get the System moving in the right direction. There is danger if a large philanthropist were to come in and distort funding...” (CGIAR Secretariat, 2007a, p.20).

In these ways, Centres and the Secretariat sought to retain control over setting the research agenda, and put in place limits on donor power.

6.4.2.2. System priorities

The new SC was tasked with setting System Priorities, which would guide Members in their funding decisions.

The SC considered that adopting System Priorities would create a more coherent research programme across the Centres and provide clarity to external actors, enabling CGIAR to develop shared agendas and build partnerships (CGIAR Science Council, 2005b). SC also hoped that it would encourage donors to re-focus their funding on CGIAR priorities rather than individual projects, and might attract new funding.

The development of priorities represented a big step towards a more unified system:

“For the first time the CGIAR will have a set of System priorities that is not simply an aggregation of Center priorities.” (CGIAR Secretariat, 2005b, p.7)

The SC used three criteria to identify the priorities:

- The expected impact on poverty alleviation, food security and sustainable NRM

- Whether the research would deliver IPGs
- CGIAR's comparative advantage in conducting the research (CGIAR Science Council, 2005b)

SC presented 20 priorities clustered under five headings:

“...Sustaining biodiversity for current and future generations

...Producing more and better food at lower cost through genetic improvements

...Reducing rural poverty through agricultural diversification and emerging opportunities for high-value commodities and products

...Promoting poverty alleviation and sustainable management of water, land, and forest resources

...Improving policies and facilitating institutional innovation to support sustainable reduction of poverty and hunger.” (ibid p.4)

SC presented the System Priorities as changing the emphasis of CGIAR research, to focus on addressing development concerns rather than agricultural production only. However, Members complained that

“...they did not get a clear sense of what is new in the identified priorities. All existing Center activities seem to fall into one or the other of these priority areas.” (CGIAR Secretariat, 2005b, p.8)

Those priorities therefore did not help Members choose what to fund.

The priorities also triggered widespread debate about CGIAR's mandate. The SC stated that the priorities enacted CGIAR's mandate to produce IPGs and to produce research for development. But Members and Centres raised

“...several questions regarding how to define an international public good and how to differentiate research for development from development activities...” (CGIAR Science Council, 2005c, p.6).

This was a continuation of debates in 2000 (see section 6.3.4), which had revealed concerns over whether poverty reduction work met CGIAR's mandate to produce GPGs. The SC's System Priorities sought to draw Centres' work back to I/GPG production, but were challenged by both donors and Centres.

As a result, SC agreed to examine in more detail the concept of IPGs and understandings of the 'research to development continuum' and set up two working groups to “...provide working definitions with practical examples, so as to help guide Centers in their implementation of Priority Research.” (CGIAR Science Council, 2005a, p.3)

6.4.3. GPG debate

As part of the process of trying to reach some conclusions about the System Priorities, the working groups commissioned papers and organised workshops. These included a paper examining conceptualisations of IPGs¹⁹ (Ryan, 2006), a paper on partnerships (Spielman and Grebmer, 2006), papers from a workshop exploring the concept of ‘research for development’ (CGIAR Science Council, 2006b) and three papers examining the relationship between IPGs and IPRs (CGIAR Science Council, 2006a).

Jim Ryan’s (2006) paper examined approaches to IPG production in CGIAR. He was a member of the Science Council (SC), and wrote the paper as a contribution to a side meeting between some members of the SC and CDC at the 2005 annual meeting. The paper laid out internal arguments about how CGIAR should understand its IPG mandate. The analysis was located in the context of increasing interest from funders in GPG programmes. Ryan saw an opportunity for CGIAR to capitalise on this new strand of funding by demonstrating that CGIAR produced GPGs.

The paper brought together internal CGIAR thinking on IPGs, but did not engage with wider literature on GPGs, such as Kaul et al.’s (2003) GPG theory (see section 3.2). Ryan took as his working definition:

“International public goods are taken to mean research outputs of knowledge and technology generated through strategic and applied research that are applicable internationally to address generic issues and challenges consistent with CGIAR goals.” (Ryan, 2006 p.8, quoting Harwood et al, 2006)

His analysis was based on several assumptions, both about the nature of GPGs and the nature of CGIAR’s work, for example:

- a narrow definition of IPGs, considering rivalry and excludability of CGIAR research outputs but not characteristics such as relevance or accessibility
- an assumption that IARC research outputs should be “...designed to capture economies of scale and scope...” (Ryan, 2006, p.1) in order to qualify as International PGs
- that it is appropriate for the private sector to provide public goods if that “...appears more cost-effective.” (ibid p.2) regardless of issues such as equitable access for poor end-users.
- that PGR management and crop development are uncontroversially GPGs:

¹⁹ CGIAR documents during this period generally referred to IPGs, not GPGs. The thesis uses the terms interchangeably.

“Perhaps the least controversial components of the CGIAR from an IPG perspective are the international germplasm banks, with their obvious inter-generational and existence values. Beyond those we have increasing difficulties in articulating what are true IPGs in the CGIAR.” (ibid p.3)

Instead of examining what IPGs were needed by CGIAR’s intended beneficiaries, and were appropriate for CGIAR to produce, Ryan reversed the question, asking what work should Centres do, and can it be categorised as IPG work to capitalise on donor interest and tap into new funding streams?

But donors also wanted CGIAR to demonstrate impact on poverty and food insecurity. Ryan restated perspectives expressed in the consultations in 2000, that IPG research and actions to reduce poverty may be in conflict on the grounds that poverty reduction applied in a specific location and so could not be regarded as an *international* public good.

This framing – pitting generating knowledge against generating impacts on poverty – raised questions about the relevance of CGIAR’s research, or whether relevance was a primary consideration.

Debates in 2000 about whether NRM work met the criterion of producing IPGs (section 6.3.4) were reshaped into questions of how much ‘development’ work CGIAR Centres should do to ensure an impact of their research. Ryan took it as given that CGIAR produced IPGs but acknowledged that their production may not have an impact on poverty reduction. Ryan’s paper was an attempt to square this circle, but he was reluctant to challenge any of CGIAR’s core paradigms.

In particular, he did not challenge CGIAR’s distance from the end-users of its research. While he argued that CGIAR priorities were ‘demand-led’, he noted “...farmers and the poor in developing countries did not play a direct role...” (Ryan, 2006, p.9) in identifying them. Instead, their demands were articulated by internal CGIAR stakeholders, leading to “...a “demand-informed” but “supply-led” approach to priority setting...” (ibid). Ryan did not explore the public-ness of PGs, when research problems to be addressed are decided by CGIAR scientists.

Ryan recognised that CGIAR’s standard cost-benefit analysis measured overall benefits but did not examine who bears the costs. This may have led CGIAR to conduct research which was of greater benefit to richer rather than poor farmers. Repeatedly, throughout the paper, Ryan’s assertion that there was a clash between the goal of producing IPGs and the goal of reducing poverty implied that the knowledge produced through IPG research was not relevant to the needs of poor people. Ryan did not examine that conundrum.

Ryan tried to ascertain whether NRM work met the criterion of producing IPGs. He concluded that much NRM work required CGIAR to play a facilitation role to build partnerships within broad innovation systems. However, he considered that networking and partnership building processes came at the expense of direct research activities.

“Proponents imply these processes will enhance impacts *per se*, but the jury is still out on this issue.” (ibid p.16)

Ryan acknowledged that research conducted in a single location may have global impacts, or global applicability, but considered that this distinction was not well understood and concluded that, as a provider of IPGs, CGIAR should focus on working at international, rather than local or national level.

Ryan argued that Centres only have responsibility to produce research intended to be IPGs and did not have responsibility to act to address market failures that might prevent research outputs reaching those who need them. In this view, research can still qualify as an IPG even if research outcomes, adoption or impact have no IPG characteristics. He argued that Centres have little control over impact pathways and therefore should not be held responsible for the impact of their research.

Ryan concluded that:

“...there may not necessarily be a perfect congruence between the humanitarian goals of the CGIAR and the IPG imperative.” (ibid p.20)

In this binary, Ryan came down in favour of IPG work, broadly arguing that CGIAR’s funding needs were more important than its mission to reduce poverty.

“The increased interest in funding GPGs is in contrast to support for the CGIAR...in the last 15 years...To follow more of an IPG-driven agenda, regardless of whether developed or developing countries are the major beneficiaries, rather than a purely humanitarian one, hence might allow the CGIAR to harness additional resources, both from ODA and perhaps national and international science and technology budgets. The CGIAR should consider these issues as it continues the reform processes within the system.” (ibid)

6.4.3.1. PSC perspectives on GPGs

The PSC was also concerned to understand, and shape, CGIAR’s public goods mandate. It discussed the relationship between public and private goods at nearly every meeting from 2001 to 2007. PSC members were particularly concerned about how CGIAR’s public goods mandate affected its management of PGR, including its decisions in response to the Seed Treaty, and its management of IP related to seed technologies. The PSC continued to argue (c.f. CGIAR PSC and Ozgediz, 1997) that CGIAR should modify its mandate to fit with developing

IP regimes and to facilitate partnerships. The establishment of CPs added weight to their argument, as Centres began negotiating with private companies over access to technologies.

PSC was keen to support the development of partnerships with CGIAR Centres, and saw a role for NGOs and private actors in the delivery of research outputs, which it did not consider CGIAR to be effectively involved in. However, it argued that, to do so,

“Removing impediments and addressing downstream IPR, regulatory and public good aspects are critical.” (CGIAR PSC, 2003, p.3)

CGIAR was equally keen for PSC involvement in policy development, with the Chair, Ian Johnson requesting PSC help in facilitating PPPs (ibid).

PSC developed its role within CGIAR alongside engagements with other actors in the global agri-food system, particularly the World Bank through its CEO forum (CGIAR PSC, 2002). WB’s globalisation agenda and PSC’s interests in accessing new markets were aligned, and they both used their influence within CGIAR to shape its policy directions.

6.4.3.2. SC views on GPGs

The question of how to define IPGs was closely linked to questions of CGIAR’s place on the ‘research to development continuum’. This concept was discussed in a workshop (CGIAR Science Council, 2006b), which explored the relationship between local and global research; and the mechanisms through which local research might have global relevance or impact and become an IPG. SC’s background paper for the workshop confronted the challenge facing CGIAR in its claim to produce IPGs:

“...the transition from declaring the desirability of a global public good to its existence is anything but automatic: ultimately it has to be produced and delivered.” (ibid p.28)

The workshop examined options for delivering goods and the implications of different models for partnership development. SC stated that Centres should engage with others in problem identification and should conduct research into barriers to technology adoption. This implied that SC considered Centres had some responsibility for research impact.

However, in the workshop, the SC Chair reiterated Ryan’s view that CGIAR should be responsible for outputs only, not impacts:

“We cannot hold the CGIAR accountable for impact, since there are so many elements in developing and deriving impact from research. But the CGIAR does need to be accountable for its promised outputs.” (ibid p.54)

SC’s contribution to the debate stressed the importance of developing partnerships with other IAR actors to deliver CGIAR’s research to end-users.

However, not all workshop participants considered CGIAR capable of developing the necessary partnerships or understanding the systemic nature of poverty challenges. Theo van de Sande – who was head of Netherlands foreign ministry – argued that CGIAR has not considered its position “...as a partner in development as well as in research.” (Van de Sande, 2006, p.96) He called on CGIAR to engage more with development actors, and challenged SC’s view that considered new knowledge outputs as uncontroversially GPGs. Van de Sande questioned the relevance of such knowledge production to poverty alleviation, and the ‘good’ nature of CGIAR’s science.

6.4.4. Programmatic approaches to the GPG mandate

While different understandings of the GPG concept were being debated, programme work claiming to produce GPGs was going ahead. GPG terminology framed the Generation Challenge Programme, which focused on genomics, a programme upgrading genebank databases (GPG1)²⁰ and a programme on System-wide information management (ICT-KM). These three programmes brought about a major shift in CGIAR’s approach to information about PGR, and demonstrated CGIAR acting to reinforce its founding conceptualisations of its GPG mandate in relation to PGR management.

6.4.4.1. GPG1 Project

The Centre-FAO agreements signed in 1994 required Centres to make PGR and ‘related information’ available to researchers and breeders. This information included “...passport and characterization data and, when available...evaluation data and information on indigenous knowledge.” (CGIAR GRPC, 2006b, p.8). To comply, CGIAR had established the Systemwide Information Network for Genetic Resources (SINGER) in 1994, linking Centres’ genebank databases to provide one entry-point to all data on PGR held in CGIAR collections. By 2003, this system needed upgrading in order to meet the standards required by the Seed Treaty. However, as donors increasingly funded Centres on a project-by-project basis, unrestricted funding needed to cover genebank maintenance costs was difficult to secure.

In February 2003, Centres submitted a two-part proposal to the World Bank “...for the funding of global public goods in the form of genebanks and databases.” (CGIAR CDC, 2003, p.6). A three-year programme was approved to “...address shortcomings and backlogs in essential conservation operations...” (SGRP, 2004, p.6), and to upgrade CGIAR’s information systems

²⁰ CGIAR’s historical archive contains no documentation relating to GPG1, though some information is contained in SGRP annual reports. Additional documentation was obtained through a Freedom of Information request to the World Bank.

(see ICT-KM below). There is no record of the proposal in either the CGIAR or World Bank archives, or any record of CGIAR Members approving the grant, implying that this area of work was unilaterally supported by the World Bank.

The 'Global Public Goods Rehabilitation Project', Phase 1 (GPG1) ran from 2003 to 2006 and was followed by GPG2 (2007-2010). GPG1 focused on improving standards and systems of conservation in the genebanks. GPG1 was predicated on

"A recognition of the pure global public goods status of the CGIAR crop diversity collections..." (ibid)

It was not explained who recognised them as pure GPGs. However, SGRP stated that the collections' GPG status had led to an

"...understanding of the central role that the collections will be expected to play in an emerging global system governing conservation and use." (SGRP, 2006, p.1)

SGRP claimed that the collections were already a significant element of the IAR system but stated that "...their full value can only be realized if their traits are known and documented." (ibid p.8) The report did not define what it meant by 'value'.

GPG1 focused on the management of PGR and their accompanying data. But, alongside developments in the Generation CP, the nature of the information associated with genebank accessions was changing, moving to the molecular level, about specific traits.

"SINGER is also exploring an entirely new form of characterization data— genomic information—which is emerging from the Generation Challenge Program and other efforts." (ibid p.14)

The type and format of information being held and shared was changing, specifically to meet the needs of researchers working on biotechnology. Such information was relevant and accessible only to a narrow spectrum of researchers and plant breeders working in specific ways. Molecular-level data were not relevant to farmers' groups or others who may be interested in increasing or restoring local level biodiversity.

This approach privileged a view of PGR as raw material for scientific research to improve crop performance in isolation from its environmental and social contexts, and privileged information about individual and separable genetic traits over knowledge about the multiple functions of a food crop as part of farmers' livelihood strategies. The programmes reinforced CGIAR's top-down science-led approach to research for development.

6.4.4.2. Information management

In 2004, a programme on information and communications technology and knowledge management (ICT-KM) was set up (CGIAR Secretariat, 2005a). The purpose of this programme

was to improve internal information flows and help CGIAR staff connect with each other across Centres, as well as providing one entry point for external users of CGIAR information (ICT-KM, 2004a).

ICT-KM's 'Global Public Goods Strategy' developed out of the GPG1 programme (ICT-KM, 2004b). It stated that "...databases and raw scientific information..." arising from CGIAR research, and "...spatial and graphic information, published research, gray literature and technical reports, and other information, tools and knowledge products..." all constituted GPGs (ibid p.3).

The programme aimed to make this information more accessible, and to

"...preserve, produce, and improve access to the agricultural global public goods needed by the poor in developing countries." (ICT-KM, 2004a, p.4)

The programme initially focused on improving access to CGIAR research and knowledge, internally and externally. The types and forms of knowledge produced were not questioned. However, a consultation in 2007 on plans for ICT-KM's second phase raised several questions about the nature of GPGs it possessed and provided.

Participants in the consultation (ICT-KM, 2007) expressed the view that the value of public goods lay in their public-ness, and sought to increase access to information about PGRs for non-scientists, as well as for scientists. They challenged CGIAR on how end-users were characterised, calling for the provision of information in formats and languages which would make it accessible not only to researchers but also to farmers. They also asked whether the type of information CGIAR produced was relevant to farmers. They questioned the programme's vision of one-way information flows, challenging assumptions about the value of knowledge held by indigenous communities, national universities, farmers and others traditionally seen as recipients, rather than producers, of GPGs. They called on CGIAR to see farmers as partners in knowledge-production, not only users of CGIAR-produced knowledge.

Based on these inputs, the programme developed the 'Triple A Framework' in 2008, which aimed to

"...assist scientists, managers and information professionals develop pathways to improved accessibility for their outputs." (Ballantyne, 2008, p.1)

This illustrates how two programmes designed as technical projects to improve some basic systems, ended up raising significant policy questions concerning the purpose of, and target end-users for, CGIAR's research.

6.4.4.3. Challenge Programmes, partnerships and delivering research outputs

A core element of the new structure was the creation of Challenge Programmes (CPs). The CPs were designed to change the way CGIAR operated, by encouraging Centres to work with each other and with external partners. The aim was to increase efficiencies by sharing resources and knowledge, align priorities across Centres and donors, and bring new scientific expertise into CGIAR. CGIAR was particularly interested in accessing technologies developed by private actors and saw CPs as a mechanism to build the necessary partnerships. The Change Design and Management (CDM) team also envisaged the CPs as a mechanism for improving the relevance and impact of CGIAR's programmes by bottom-up problem identification involving a wide range of stakeholders, including NARS and GFAR (CGIAR CDM Team and Catley-Carlson, 2001).

Ten CP concept notes were discussed at the 2001 AGM, and three were approved as pilot programmes (CGIAR Secretariat, 2001). Of these, two focused on genomics: the HarvestPlus CP, which worked on biofortification, and the Generation CP, which focused on genomics for crop development. The third pilot CP, on Water and Food, aimed to bring scientists, communities and development actors together to improve water management in selected river basins.

The Generation CP was based on CGIAR's traditional research approach of crop development to improve food security. It aimed at

“...unlocking the genetic potential and enhancing the use of public genetic resources in plant breeding programs...Beyond this, the Challenge Program will identify, manipulate, and validate gene expression resulting in plants with potential value far beyond present-day crops.” (Generation Challenge Program, 2004, p.1)

The SC was strongly in favour of the Generation CP because it was “...very exciting from a scientific viewpoint.” (CGIAR Secretariat, 2002c, p.5) ExCo members also felt it “...would generate significant GPGs.” (ibid) PSC members were in favour of its planned work “Maintaining alleles (for future mining efforts)” (CGIAR PSC, 2002, p.8).

The HarvestPlus and Generation CPs both fitted SC's preferred model of 'cutting edge science' aimed at addressing generic problems of international relevance. They both used the language of GPG production, despite ongoing debate about the concept.

PSC members – several of whom worked for agribusiness TNCs²¹ – responded positively to the establishment of CPs, considering them “...pivotal mechanisms of change within the CG System.” (CGIAR PSC, 2002, p.7). They were keen to shape the CPs, offering help in designing them, promoting them to other private actors and peer-reviewing the proposals (ibid).

By 2004, PS actors were heavily involved in shaping the CPs. The PSC commended the involvement of major private sector actors in the Generation CP: “Dupont-Pioneer, Syngenta, Monsanto, Mahyco and Genoplante.” (CGIAR PSC, 2004, p.2). They were also pleased to note that the HarvestPlus CP was

“...very clear on who their clients are – the plant breeders. HP...also is aligned with the food industry.” (CGIAR PSC, 2006, p.3)

PSC did not question how this alignment might uphold CGIAR’s mandate to serve the needs of poor farmers in LICs.

At AGM 2004, CGIAR Members discussed different approaches to partnership across the three pilot CPs. SC and the Secretariat presented a joint review of the pilot CPs. They considered that

“In the context of the CP, the criteria for an effective partnership include providing more than one of the following services:

- improve the relevance of the research
- lever added value to the component parts
- provide new research of high quality
- improve the delivery of the research for outcomes.” (CGIAR Secretariat and CGIAR Science Council, 2004, p.5)

They considered that the HarvestPlus and Generation CPs had both developed partnerships which provided “...new high quality research and access to facilities to the programs and clearly lever added value for developing time-bound research outputs.” (ibid)

The Water and Food CP had, by contrast, developed partnerships to improve the relevance of the research. While SC recognised the value of this role, it did not consider it sufficient justification for the transaction costs and time commitment that had gone into developing the partnerships. This suggests that SC had greater understanding of the mechanisms of partnership with PS actors than with development actors. Nonetheless, in relation to the proposed Sub-Saharan Africa CP, SC considered partnership development, and the learning associated with it, to be an IPG output of the CP.

²¹ For instance, Rob Horsch worked for Monsanto, William Niebur for DuPont and Bernward Garthoff for Bayer.

In 2005, IFPRI organised a workshop to explore mechanisms for implementing PPPs in the context of CPs. PS participants called on CGIAR to restructure itself to make PPPs more feasible:

“The longstanding principles of decentralization and center autonomy are not helpful in dealing with the private sector. The system’s recent creation of Challenge Programs...offer a much better model from the private sector’s point of view.” (IFPRI, 2005, p.6)

This push towards PPPs across CGIAR, came despite:

“...the substantial knowledge gaps that still surround partnerships, including the issue of how pro-poor many partnerships truly are; what measures are used to assess the quality, quantity, and effectiveness of partnerships; ...and whether they are simply masquerading as public relations exercises.” (ibid p.7)

The CPs were designed to build partnerships with public and private actors. However, ‘partnership’ was poorly defined and understood differently by different stakeholders across CGIAR.

There is no indication that CGIAR saw any contradiction between its work providing research outputs for use by industrial agriculture TNCs, and its commitment to providing GPGs. There is also no indication that CGIAR saw their role in helping TNCs gain access to new markets in low-income countries as in any way working against the interests of poor farmers in those countries.

Instead, CGIAR aligned itself with agri-food industry interests. CGIAR’s Chair (Ian Johnson) saw this as creating opportunities for small farmers, who might access new markets (CGIAR PSC, 2004). He did not explore the impact on marginal farmers unable to participate in markets, or the relative power of small-scale farmers compared to TNCs acting in the same markets. CGIAR’s positioning as an ‘apolitical’ body led it to respond to changes in the agri-food system, rather than examining its role within them, or whether it could (or should) challenge such changes.

CGIAR’s approach to developing partnerships within CPs fitted with, and supported, processes of privatisation and global integration of markets for seeds and other agricultural inputs. These processes were resisted by actors concerned with social, environment and food democracy issues. In this context, internal and external actors criticised CGIAR’s approach. For instance, Sharma (2004) criticised CGIAR’s development of public-private partnerships, characterising the approach as CGIAR acting as a contractor for agribusiness companies, serving the interests of industry rather than the needs of poor farmers. Internal criticism came from the NGOC, which had already withdrawn from engagement with CGIAR (see section 6.3.3) over its

perceived failure to engage with diverse actors; participants in the ICT-KM consultation (section 6.4.5.2), who called for CGIAR to broaden its understanding of partnerships; and some donors, who criticised CGIAR for not having the skills to develop partnerships with diverse actors (Van de Sande, 2006).

6.4.5. IPR debate

The new rules of the Seed Treaty had practical implications for CGIAR's handling of IP. GRPC took a lead on issues such as advice to Centres on IP management; ensuring protection of TK; supporting Centres to protect genetic material from patenting by others, including challenging external patent claims where appropriate; and dealing with continued controversy over Centres' handling of PGR transfers (see box 6.6).

Internally, CGIAR actors had to respond to moves taken since the 2001 change process to increase engagement with private companies and academia, opening up CGIAR to greater interaction with industry and other potential research partners. This was led by the PSC, which had established an exchange programme between

CGIAR and industry scientists (CGIAR PSC, 2003). The exchange programme had raised concerns among PS actors about CGIAR's competence to manage confidential information, but had also influenced CGIAR's approach to IP:

“The first exchange with IFPRI led to IFPRI making some changes to its IP policy.” (ibid p.3)

GRPC worked on developing new IP principles, and drew up a template IP policy statement for Centres (CGIAR GRPC, 2005a), to create consistency across Centres in the way they managed IP

Box 6.6 Examples of impacts of IP on Centre work

In 2001, IRRI had been accused of providing researchers in the USA with rice varieties from its genebank without the appropriate MTAs which would prohibit them from taking out patents (CGIAR GRPC, 2002). This raised fears among farmers in Thailand and elsewhere that their export markets would be threatened if the USA started to grow similar varieties (MASIPAG, 2001). IRRI claimed the unauthorised transfer was a mistake, and the researchers had subsequently signed an MTA. However, the incident illustrated the gaps in Centres' IP management systems.

In 1999, a farmer in the USA took out a patent on a yellow bean, which he had developed from seeds bought in Mexico (RAFI, 2000). In 2000, CIAT had challenged the patent on the basis that their genebank contained genetically identical bean varieties which were part of its 'in-trust' collection. The patent was initially overturned in 2005 (CGIAR GRPC, 2006a), and finally rejected after all appeals in 2009.

In 2005, Monsanto took out a case against Argentina over exports of soybean flour. Monsanto did not have a patent on its soybeans in Argentina, but did have IP rights in several European countries. When Argentina started exporting soy flour produced from the beans to Europe, Monsanto argued that it was violating the European patents. GRPC considered that this was “...a significant attempt to expand the scope of control of patent holders.” (ibid p.9). They were particularly concerned about the implications for Centres if they provided materials containing patented genes to low income countries, which then exported the resulting product. The European Court of Justice ruled against Monsanto in 2010.

issues. This was the first step towards developing a new IP policy, which would update the guidelines approved in 1996. Internal pressure for the development of a

System-wide IP policy came from the PSC (see section 6.4.4.1). It argued that CGIAR must have a clear IP policy and IP management systems before PS actors would be prepared to enter partnerships with Centres. The establishment of the new Challenge Programmes, creating partnerships between several Centres and private companies, also demonstrated the need for a single approach across Centres.

The template policy statement included statements of general principles which Centres should adhere to, including that “access to its outputs should be fair and equitable, with as few restrictions as is possible.” (ibid)

As in earlier IP guidelines, the template set out when a Centre might seek IP protection for its outputs. IP should only be taken out “...when necessary to serve the resource poor.” (op.cit.:12) The circumstances when this might apply were broadly similar to those included in earlier guidelines.

However, work to develop a coherent approach to IP management across Centres was hampered by internal structures:

“Six bodies are currently addressing IP issues system wide: GRPC, CAS-IP, Private Sector Committee, Science Council, IFPRI’s Public-Private Partnership Initiative and most recently, the CG Secretariat.” (CGIAR GRPC, 2006b, p.5)

The Science Council was therefore concerned, in 2006, to agree policy on IP management. They commissioned three studies, examining how Centres managed IP, how CGIAR scientists could identify and access “third party IP”, and

“...the humanitarian licence movement and intermediary organisations that have been formed to facilitate the transfer of IP between the private and public agricultural sectors.” (CGIAR Science Council, 2006a, p.2)

The three commissioned studies presented an internal CGIAR perspective (CAS-IP, 2005), a private sector perspective (Chojecki, 2006) and a donor view (Toenniessen and Delmer, 2006).

CAS-IP (2005) argued that Centres needed to improve their understanding and management of IP to gain the trust of private actors before they would establish partnerships with CGIAR. They asserted that IP agreements could enable distribution of research products to the public:

“However, the positive relationship between good IP management practice and the increased availability of public goods is not well understood.” (CAS-IP, 2005 p.13)

CAS-IP described a reluctance amongst CGIAR scientists to engage with IP issues, only doing so when things have gone wrong, or when pushed to do so by donors (ibid p.14). The partnership requirements of the CPs “...in particular the Generation Challenge Program...” had also pushed Centres into engaging with IP issues.

CAS-IP's view was that effective IP management was necessary to maintain CGIAR's public goods mandate. While calling on CGIAR to change its attitude to and administration of IP, it also stated:

“The CGIAR should formulate a strategic initiative to emphasize the public goods nature of their products and public access culture of the mode of distribution of products.” (ibid p.33)

Chojecki (2006), an expert on IP issues, outlined some of the PS concerns and interests in developing partnerships with CGIAR Centres.

He argued that CGIAR should not see IP as inhibiting access to technology, because companies often wanted to work with CGIAR, and would be willing to share their technology “...provided certain assurances can be given and conditions met.” (ibid p.40)

However, he then laid out several concerns expressed by PS actors. These included issues of market segmentation; future access to research arising from technology granted to CGIAR; the risks of technology dissemination in countries with different regulatory systems which may not uphold agreements; gains for commercial rivals; and CGIAR's competence regarding stewardship and maintaining confidentiality.

Some companies would be willing to use 'humanitarian licences', but only if doing so did not impact their commercial interests. Throughout the paper, Chojecki made clear that PS actors would not act to undermine their own interests. Instead, CGIAR would have to adapt its approach to working with industry.

Chojecki reported CGIAR researchers' concerns about a core contradiction in CGIAR's approach: that increasing use of private actors to deliver research outputs had blurred the lines between “...the “subsistence” versus “commercial” status of downstream activity from CGIAR research.” (ibid p.41) Private companies therefore saw CGIAR distribution mechanisms as potential competitors. Additionally, international companies were increasingly seeking new markets in countries that CGIAR worked in. Globalisation processes reduced the relevance of 'market segmentation' as a strategy.

Chojecki concluded that he could envisage CGIAR being able to manage stewardship issues.

“What is harder to see a near term solution to, is the issue of where subsistence/non-profit agriculture stops and commercial competition starts.” (ibid p.48)

This highlighted, once again, the lack of clarity over who were the intended beneficiaries of CGIAR's research.

The third paper (Toenniessen and Delmer, 2006) was written by representatives from the Rockefeller Foundation, one of CGIAR's first funders. Toenniessen and Delmer placed debates about the use of IP in a wider context. They described how IP rights had changed the shape of the IAR system, enabling industrialised countries to "...exploit their competitive advantage in research and development..." (op.cit.:56) through trade deals and had led to the "oligopolization" (ibid p.57) of seed markets in the EU and USA. The authors highlighted the importance of PVP systems appropriate to the needs of different countries, rather than the export of a US-designed IP model.

Toenniessen and Delmer described developments in US patent law (the 1980 Bayh-Dole Act), which had led to a huge increase in patent protections on research conducted by public bodies such as universities. This meant that companies wishing to commercialise products arising from such research needed "...an IP portfolio covering most of the technologies used." (ibid p.58) and public sector research was increasingly inaccessible to CGIAR Centres.

The authors suggested that the solution was 'intermediary organisations' which would enable

"...large private sector companies with large IP portfolios in agriculture...to share these technologies for humanitarian goals..." (ibid p.61)

The paper described the activities of three²² intermediary organisations that aimed to negotiate 'humanitarian licences' through which companies could share technologies. As set out in the previous papers, companies set conditions on the use of such technologies, including:

"The agreements should allow for protection against use of the technologies in ways that interfere in the company's own commercial spheres of interest." (ibid p.62)

The three papers together revealed the boundaries of PS interests in 'humanitarian' actions when they clash with market interests. CGIAR's programmes were based on a model of creating economic growth by improving agricultural productivity. But when the farmers they worked with were able to operate at a commercial scale, they became competitors to the PS actors with whom CGIAR wished to partner. Similarly, TNCs were seeking new markets in low-income countries, while those countries were seeking new markets for their export products, produced as a result of the trade-based model of agricultural development pushed by the World Bank and other donors (see Chapter Two). As farming systems became more interlinked and markets became more connected, it became harder to keep products provided free to

²² Public Intellectual Property Resource for Agriculture (PIPRA), Biological Innovation for Open Society (BIOS), African Agricultural Technology Foundation (AATF)

resource-poor groups out of commercial markets, and it became harder to protect IP through market segmentation. PS intentions to help low-income countries clashed directly with their imperative to capture profit.

SC/GRPC presented a 'commentary and recommendations' on the three studies (Gale et al., 2006). They argued that CGIAR had to respond to changes in the internal and external environment, including Centres finding "...increasingly and particularly in the molecular biology area, that they need to be able to use proprietary technologies..." (Gale et al, 2006 p.1); the growth and consolidation of the private plant breeding sector; the spread of biotechnology crops into developing countries; the development of 'humanitarian licences'; and changes to how non-Annex 1 crops were to be treated, including moves to ensure access and benefit-sharing (ABS).

The studies focused on CGIAR's 'freedom to operate' which could be considered to have been limited by the terms of the CBD and the Seed Treaty. Gale et al. stressed the need for CGIAR to recognise the interest of other IAR actors to work with CGIAR, and challenged the wariness of CGIAR scientists regarding patents, which many considered to be an obstacle to IPG work. Gale et al. called for a culture shift within CGIAR to enable it to become more proactive in negotiating access to proprietary technologies. They recognised the challenge of accessing and using proprietary technologies in ways that would ensure research outputs could still be made available as public goods, and the importance of NARS as partners in getting products to farmers.

They also recognised the need to balance the potential benefits and opportunities arising from IP protocols with the need to protect PGR and guard against "...abuses and distortions of the IP system..." (ibid p.3) which would undermine IPG research. To this end, both CGIAR and NARS needed to develop negotiation skills.

But they stated:

"The CGIAR partners will have to be clear that, in this environment, IPGs are compatible with IPRs, albeit with new legal boundaries that change the terms of access and exchange." (ibid)

No evidence was provided for this assertion, and the new terms were not described.

They highlighted the different interests of public and private sector actors, and the need for CGIAR to gain a better understanding of both in order to build effective partnerships. They recognised that:

"In general, however, agreements will come about only with the private sector partner's commitment to participate in the betterment of the world, independent of its own financial interests..." (ibid p.5)

Again, no evidence of this commitment was provided.

While Gale et al. noted the importance of public sector relationships, all the papers focused on relations with private actors. The studies focused on how CGIAR might access material held by others, rather than examining how CGIAR might make its own research and materials freely available, or how to protect CGIAR knowledge and technologies from private appropriation. There was little engagement with CGIAR's responsibilities for the PGR it holds 'in trust', or with ethical issues regarding access to technologies. Farmers' research and innovation were not considered. Broader questions about the relevance of IP-protected technologies were not raised.

Gale et al. concluded that

“...the CGIAR must increase access to IP from both the private and public sectors if we are to maximize the benefits of our work for the lives of the world's poor.” (ibid p.7)

They recommended the development of better System and Centre level management of IP and PGR; improved information systems; actions to incentivise a “culture shift” in CGIAR; and the redrafting of IP guidelines. They concluded with a call for CGIAR to “...clarify the conditions under which it will collaborate with the international public and private sectors.” (ibid p.9)

Following the publication of these discussion papers, GRPC challenged the limited focus of the debate and asked CAS-IP to develop guidelines to help Centres “...when obtaining information from and collaborating with indigenous and local peoples, and farmers.” (CGIAR GRPC, 2006a, p.7) GRPC and CAS-IP both sought to emphasise CGIAR's public goods mandate, but these studies demonstrated the limitations to that mandate when engaging with PS actors. GRPC also continued its work to develop System-wide IP policies and produced a draft policy in 2007. This draft was taken forward into the next reform process which began in 2008.

6.5. Conclusion

This chapter has described how CGIAR's policy positions on PGR management and IP evolved from 1995 to 2007, in response to changing global regulatory frameworks for PGR governance, and globalisation processes. It has examined CGIAR's engagement in, and responses to, those processes. It has considered internal and external challenges to CGIAR's founding narratives about its role and purpose as a provider of public IAR; the impact of those challenges on how different actors in CGIAR understood its GPG mandate; and the outcomes for CGIAR's policy directions by 2007.

In 1995, CGIAR sought to respond to donor interests expressed in the Lucerne Declaration by recasting its role as providing pro-poor research to farmers in LICs. The focus of CGIAR's work shifted (rhetorically at least) from increasing productivity to reducing poverty, with its role

moving from that of a purely scientific institution to one with a role in delivering development outcomes. However, internal actors, including CGIAR's Chair, continued to push for CGIAR to create generic, internationally-applicable science, rather than focusing on how such research might meet the needs of poor communities. In this way, powerful internal stakeholders upheld CGIAR's founding narratives about the relationship between research and poverty reduction (section 6.2.3).

Tensions between these conflicting priorities led in the early 2000s to increasing criticism from internal and external stakeholders, particularly regarding CGIAR's management of PGR held in Centre genebanks. Debates took place in the context of negotiations over the Seed Treaty and rising concerns about the impacts of globalisation on poor communities in LICs. CGIAR sought to counter criticism by framing its research as providing GPGs, but without providing evidence or definitions (section 6.3.4).

Debates over interpretations of CGIAR's GPG mandate pitted activities creating GPG knowledge (research) against activities engaging with farming communities, such as NRM work (development). Debates about IP policy were similarly framed in terms of enabling CGIAR scientists to access the tools to produce high science or protecting farmers' access to public PGR. Across both debates, CGIAR chose to align its position with that of key donors, particularly the World Bank (section 6.4.5).

In 2001, the creation of Challenge Programmes (CPs) initiated a move towards CGIAR's greater engagement with PS actors. This approach fitted with prevailing neo-liberal models of economic development based on using market mechanisms to deliver development outcomes. As discussed in Chapter Two, these models align with 'productivist' approaches to agricultural development, building on CGIAR's traditional understanding of its role at the top of a research and technology transfer pipeline. The new programmes therefore reinforced CGIAR's existing framing of its role within the IAR system (section 6.4.4.3).

The establishment of the CPs raised questions about how 'partnership' was understood within CGIAR. While both the HarvestPlus and Generation CPs had a clear interest in developing partnerships with private sector actors, roles for civil society actors were less clear. This aligned with the move towards private sector delivery of services to farmers, supported by the World Bank's and other donors' policies in favour of strengthening the role of market actors in LICs' agriculture sectors.

The WB also had a major hand in shaping CGIAR's work on the management of PGR and related information. Through the GPG1 programme, it supported increasing the availability of

molecular-level information about PGR. This prioritised lab-based crop research over farm-based approaches. The WB funding was framed as providing support to CGIAR genebanks to meet the technical standards required by the Seed Treaty. But in doing so, it entrenched PGR management systems that favoured CGIAR's founding narratives of top-down, science-led approaches to crop breeding and PGR conservation. Additionally, by using the language of GPGs to describe PGR conservation work before GPG interpretations had been agreed, it placed the work of the genebanks outside debates about how CGIAR should uphold its GPG mandate. In this way, the work of the genebanks was removed from contestation over GPG conceptualisations, and escaped scrutiny during debates about the impact, relevance, accessibility and accountability to poor farmers of CGIAR's research.

There was an explicit attempt in 2006 to provide clarity about CGIAR's GPG mandate (section 6.4.3). In this debate, GPGs were defined by some stakeholders as internationally-applicable knowledge or technology. In this conceptualisation, GPG status was not dependent on who benefitted from the knowledge, or whether it contributed to development goals. Other participants in the debate considered that GPGs were created when research outputs delivered beneficial societal outcomes. While these positions had been rehearsed in earlier debates, there was now strong donor pressure on CGIAR to demonstrate the development impact of its research. In the context of a major funding crisis, CGIAR had to act in line with donor preferences. Attempts to do so informed the subsequent reform process, discussed in Chapter Seven.

However, during this period, key actors consolidated their positions within CGIAR. The withdrawal of the NGOC and the inclusion of private foundations into CGIAR's membership shifted power dynamics among external actors seeking to influence CGIAR's approaches. Despite the rise of movements challenging the direction of change in the global food system (e.g. Via Campesina), and globalisation more generally, those voices had little traction within CGIAR. Limited initiatives such as GFAR attempted to present alternative perspectives, but CGIAR did not create mechanisms to bring them into its policy-making processes.

Internally, tensions between the Centres and the Secretariat undermined attempts to limit the power of donors over setting CGIAR's research agenda. Instead, continuing funding crises increased donors' power. For instance, the WB exerted instrumental power by unilaterally funding the GPG1 programme, which supported its approach to PGR conservation. In this way it created institutional structures that supported its narrative.

Key actors also sought to reframe narratives about CGIAR's role as a publicly-funded organisation. In discussions in 2006 on IP issues, both WB and PSC actors stated the need for CGIAR to rethink the boundaries between IP and GPGs (section 6.4.3). This blurred understandings of CGIAR's GPG mandate, enabling a discursive shift in how GPGs were conceptualised. In particular, WB and PSC argued that CGIAR had to work with private sector actors in order to uphold its GPG mandate, setting the stage for a discursive realignment of its mandate towards market-led approaches to delivering research products to farmers.

At the same time as shaping the discourse about CGIAR's mandate, the WB and private sector actors operated within the CPs to entrench their favoured approaches into programme work. Similarly, even while understandings of GPGs were being debated, powerful actors closed down the debate by stating that the work of the genebanks was self-evidently GPGs. They acted to entrench this position by the use of GPG language in the GPG1 programme, and by the practical actions that shaped how PGR was managed.

Across the internal processes and global negotiations, groups of actors with shared perspectives came together in what Hajer (1997) termed 'discourse coalitions'. For instance, industrialised country governments supported their own agri-tech businesses through their negotiating positions in the Seed Treaty, through their support for extended IP regimes and through funding CGIAR to focus on molecular biology approaches to its crop breeding work. In this way key actors were able to create mutually-reinforcing positions across multiple policy areas.

As a result, internal and external power dynamics closed down options for CGIAR's research directions. Perspectives on GPGs held by powerful actors ensured the continuity of policy positions aligned with CGIAR's founding narratives.

In 2007, CGIAR started yet another reform process to attempt to address the contradictions and contestations described in this chapter. That reform process is examined in the following chapter.

7. 2008 – 2012

7.1. Introduction

Chapter Seven maps the way in which prior debates (described in Chapters Five and Six) unfolded through the 2008-11 reform process and what emerged at the end. It focuses on the evolution of understandings about, and policy on, global public goods (GPGs), plant genetic resources (PGR) and intellectual property (IP) through that process of reform.

The chapter describes the context in which CGIAR's 2008-11 reform process took place. This included a renewed interest among CGIAR's donors in increasing global agricultural production, arising from the food price crisis that started in 2007. In response to that crisis, several of CGIAR's core donors came together to create interlinked initiatives focusing on increasing agricultural productivity and opening up agricultural markets in low-income countries (LICs). In that context, CGIAR had to clarify its role in a global agricultural research environment dominated by private sector actors; and had to respond to donor pressures to demonstrate the impact of its research on development outcomes.

Those external pressures were key to shaping CGIAR's direction of change through the 2008-11 reform process. The chapter describes CGIAR's responses to those pressures through changes in policy, organisational structure and programmatic approaches. It considers how actions taken during the reform process responded to long-standing debates about CGIAR's research priorities and GPG mandate.

Chapter Six demonstrated how perspectives on GPGs held by powerful actors ensured the continuity of policy positions aligned with CGIAR's founding narratives. Chapter Seven charts how the changes put in place through the reform process were predicated on, and enacted, a particular interpretation of CGIAR's GPG mandate. It considers how those understandings of the GPG mandate informed decisions about the reform and shaped its outcomes, including CGIAR's policy positions, ways of working and future partnerships.

The chapter lays out how organisational structures established to enable partnerships with private sector actors led to a reorientation of CGIAR's approach to its GPG mandate and revisions to its IP policy. These changes aligned the World Bank's and other donors' policies in favour of strengthening the role of market actors in LICs' agriculture sectors. The chapter also describes the role of key actors in shaping CGIAR's approach to PGR management, including through funding genebank-based conservation programmes and entrenching CGIAR's role in global crop conservation systems.

The chapter demonstrates how CGIAR's policy choices reveal its direction of change and how it positioned itself in relation to dominant discourses within debates about the functioning of the global agri-food system.

7.2. External events affecting CGIAR's role and mandate

CGIAR's 2008-11 reform took place in the context of several events that influenced global agri-food system governance, and created new structures and alliances within governance systems. The key events and changes relevant to CGIAR's work are described below.

7.2.1. Developments in international regulatory frameworks for PGR

CGIAR continued to be closely involved in the development of implementation mechanisms for the Seed Treaty, ratified in 2006. In addition, it engaged, through Bioversity,²³ in negotiations in the CBD that eventually led to the agreement (in 2010) of the Nagoya Protocol.²⁴

The Nagoya Protocol sets out a legal framework covering benefit-sharing obligations for parties accessing genetic resources along with rules for 'prior informed consent' and monitoring subsequent use of PGR.

CGIAR was concerned that

"...the protocol could undermine or replace the multilateral system of access and benefit sharing established by the International Treaty, with serious negative impacts on the CGIAR Centres' ability to produce and disseminate improved germplasm and other international public goods." (CGIAR GRPC, 2010, p.16)

Through its engagement in the negotiations, CGIAR therefore acted to try to ensure coherence between the CBD and the Seed Treaty, and to protect the agreements relating to Annex 1 crops. As a result, the Nagoya Protocol excludes PGR for food and agriculture covered by the Seed Treaty i.e. Annex 1 crops (Halewood et al., 2013), while transfers of non-annex 1 crops have to comply with the ABS terms laid out in the Protocol (Secretariat of the CBD, 2011).

There were diverse views on the Nagoya Protocol. Some NGOs saw it as closing loopholes that enabled plant breeders to circumvent access and benefit sharing terms under the Seed Treaty. Similarly, some governments (e.g. Canada and Australia) saw the Seed Treaty as providing an easier route to accessing PGR than the Protocol. There was therefore an attempt by those countries to extend the scope of Annex 1 to include more crops (Kastler, 2015). However, LICs were unwilling to agree to this because the ABS mechanisms under the Seed Treaty had not

²³ Formerly IPGRI, name changed to Bioversity International in 2006

²⁴ The Protocol's full name is the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS) to the Convention on Biological Diversity

been successful at raising funds and they had not yet seen the benefits of participating in the MLS (IISD, 2013). Food sovereignty campaigners further argued that the Nagoya Protocol maintained the framing of seeds as commodities that was embedded in both the CBD and the Seed Treaty (Hansen-Kuhn, 2016).

CGIAR continued to participate in technical committees working on how to implement the Seed Treaty (see section 6.3.4), focusing on issues around which materials were covered by the Treaty, the conditions under which PGR could be transferred, to whom, and how Centres should manage their own research products (CGIAR GRPC, 2008b). The Treaty allowed for a separate category of 'PGRFA under development', meaning Centres could add conditions beyond those included in the SMTA when transferring their research products. However, the GRPC continued to support the principle that Centres should distribute all materials freely regardless of whether this was required by the Treaty.

Under the terms of the SMTA, Centres could only distribute PGR for use in "...research, breeding and training." (FAO, 2010c, p.6) However, GRPC was concerned about farmers' access to PGR covered by the MLS (CGIAR GRPC, 2010) and argued for the principle that Centres should be able to send seed to farmers without limitations on how they used it.

"There appears to be agreement in principle, in particular amongst the CG Centres, on the utmost importance for farmers to be able to receive material directly from the Multilateral System of Access and Benefit-sharing (Multilateral System), both for research and breeding, and for direct use for cultivation." (FAO, 2010b, p.1)

GRPC agreed that Centres could choose how to distribute their own research products, and that materials received before the MLS was established were not subject to the terms of the SMTA. The Committee also decided that any PGR provided to Centres under an SMTA could only be transferred to farmers for cultivation if the provider expressly agreed, and should be provided with a statement to that effect, unless the PGR was being returned to farmers who had provided it originally. However, there was no obligation for Centres to provide PGR to farmers and there was some variation in Centres' willingness to do so (I15/2).

Box 7.1 IP and the Seed Treaty

Under the terms of the Seed Treaty, CGIAR Centres had to transfer PGR they held 'in trust' using a Standard Material Transfer Agreement (SMTA). However, the Treaty allowed Centres to choose to transfer their PGR 'under development' (i.e. their research products) using the SMTA or to include additional conditions. The GRPC promoted the principle that Centres should distribute all materials using the SMTA, regardless of whether this was required by the Treaty. However, this position changed during the course of the reform (see section 7.5).

The Seed Treaty also directly allowed for IP to be taken out on newly-developed products. Under Article 13, breeders who commercialise a product made from PGR received under an SMTA should contribute to an international fund that will finance PGR conservation and other actions under the

FAO's Global Plan of Action. Because of this, commercial breeders sought to bypass the Multi-lateral System (MLS) and obtained crops covered by Annex 1 from sources that had not signed the Seed Treaty. These included the USA, which held large collections of important Annex 1 crops (Hammond, 2011).

As a result, funds flowing into the MLS were extremely limited and biodiversity-rich countries became unwilling to place their PGR under the MLS (FAO, 2015)

7.2.2. Developments in the Global Crop Diversity Trust

The Global Crop Diversity Trust (known as the Crop Trust) was established in 2004 by FAO and CGIAR as a funding mechanism for the Seed Treaty (see box 6.4), creating an endowment fund to provide long-term finance for *ex situ* crop conservation globally. It receives donations from governments, foundations and major agro-industrial companies such as Syngenta and Dupont (GCDT, 2008). As well as raising funds, it also manages their disbursement.

The Crop Trust's work supports recommendations made in FAO's 2010 report on PGR (FAO CGRFA, 2010), which identified a lack of coherence across genebank collections, such as duplications of some accessions and incomplete collections of other crop varieties. The report also raised concerns that some national genebanks were not able to maintain their collections and associated information to an adequate standard. The report stated:

"Greater efforts are needed to build a truly rational global system of *ex situ* collections." (FAO CGRFA, 2010, p.xxi)

The FAO report also recognised that plant breeding capacity had moved from the public to the private sector, and as a result attention had shifted to a relatively small number of commercial crops.

"Considerably more attention and capacity building is urgently needed to strengthen plant breeding capacity and the associated seed systems in most developing countries, where most of the important crops are not, and will not be, the focus of private enterprise." (ibid p. xxi)

The FAO report, and the work of the Crop Trust, made a clear link between the conservation and use of PGR. As in CGIAR's narratives in the 1970s about the need for genebanks (see section 5.3.2), the purpose of preserving biodiversity was framed in terms of its value for future crop development. The Crop Trust stressed, in particular, the value of PGR in developing crops able to cope with climate change (GCDT, 2007).

As well as funding genebanks, the Crop Trust supports projects to improve PGR management, coordination between genebanks and access to information about genebank collections. Up to

2012, these projects included conservation strategies for specific crops and new software for genebank data management as well as:

- Svalbard Global Seed Vault: opened in 2008, to store duplicates of PGR from genebanks around the world to provide a ‘failsafe’ back-up in case of loss of the original collection.
- The Global Systems project: established in 2007 and funded by the Bill and Melinda Gates Foundation (BMGF). Its purpose was to regenerate and duplicate PGR samples of 22 key crops²⁵ that were at risk of being lost because of lack of capacity or funding in existing collections, with back-up in the Svalbard Seed Vault (GCDT, 2007).
- Genesys: initiated in 2008 (Crop Trust, 2015), by Bioversity International, the Seed Treaty Secretariat and the Crop Trust, with funding from BMGF (Genesys, 2017). Genesys was launched in 2011, to provide a single online portal for the databases of genebanks in USA, EU and CGIAR Centres (participation has since expanded). It provides information about collections, enabling breeders and researchers to find accessions with particular traits and to order seeds.
- Crop Wild Relatives project: A 10 year project launched in 2011 and supported by the Government of Norway to identify, collect and conserve wild relatives of 28 crops, identifying desired traits and introducing them into breeding lines for future crop development (GCDT, 2012a).
- CGIAR Genebank CRP: agreed in 2012, this gave the Crop Trust financial and managerial responsibility for the genebanks. See section 7.6.2 for further discussion.

The Crop Trust became a major core funding mechanism for the genebanks. It provided funds to CGIAR Centres, monitored and evaluated the genebank grants and ensured Centres adhered to its crop conservation strategies. It partnered with CGIAR on the development of the Genebank CRP (see section 7.6.2) and influenced policy directions for genebank management and PGR conservation. It became an independent legal entity in 2012 (*ibid*), no longer under the auspices of CGIAR and FAO, but instead becoming the manager of the Genebank CRP. While it still reported to the Seed Treaty Governing Body, there was concern from some NGOs that it had become an alternative – rather than complementary – funding mechanism for the Seed Treaty, with minimal oversight from UN bodies and whose governance was dominated by corporate actors (I15/2).

²⁵ See Appendix Four for discussion of which crops were included.

Some NGOs also criticised the role of the Global Seed Vault at the centre of a network of genebanks (Kimbrell, 2020). It required national or local genebanks to place their collections into the MLS, but access and benefit sharing terms under the Seed Treaty had not yet been agreed (Rimmer and McLennan, 2012). NGOs were concerned that the terms of depositing collections privileged corporate actors and increased their access to seed collections that might otherwise not be part of the MLS (Acharya, 2008); but without providing smallholder farmers or their representatives with the necessary technical support to allow them similar access.

The Crop Trust reinforced narratives first expressed in the 1970s, that linked the value of biodiversity conservation to use by plant breeders. Its approach was based on the premise that biodiversity is conserved by taking it out of fields and putting it into genebanks; and that biodiversity in agricultural crop production arises from inserting traits found in crop wild relatives or farmers' landraces into crops for industrial agriculture. Woodhouse (2009, p.268) observed that developments in biotechnology had "...sharply increased the potential profitability of commercial investment in seed improvement..." by extending the range of crops for which seed companies could "...impose inventors' charges and restrict seed-saving and exchange by farmers."

The Crop Trust's approach was criticised by NGOs such as GRAIN, which argued that *ex situ* conservation privileged breeders over farmers and undermined farmers' rights (GRAIN, 2008). Although the Seed Treaty allows for farmers to access seeds held in genebanks, there was, as noted above, no obligation on genebank managers to provide access. GRAIN (and others, e.g. Hopkin, 2008) argued for the importance of conserving biodiversity in farmers' fields. They argued that, by channelling considerable funding exclusively to *ex situ* conservation, the Crop Trust diverts funds and policy interest away from *in situ* biodiversity conservation.

7.2.3. Developments in global food system governance

CGIAR's work was directly affected by changes in regulatory frameworks for governing PGR and biodiversity. It was also affected by shifts in the governance of the global agri-food system, and in the aid sector more broadly. Changing – and diverse – framings of 'development' within donor governments were reflected in their funding and policy decisions, including those relating to the role of agricultural research in supporting 'development'. Some of the policy processes, reports and initiatives that most influenced CGIAR's decisions in the 2008-11 reform are presented below, including initiatives created in response to the global food price crisis 2007-11.

7.2.3.1. Aid effectiveness

The 2005 Paris Declaration on aid effectiveness set out to recast the relationship between donors and recipient countries. Its purpose was to improve the quality and impact of aid, responding to criticisms of the conditionality associated with structural adjustment programmes and the ‘projectisation’ of aid (UNDESA, 2013). It laid out five key principles: country ownership of development policies; alignment of donor funding to support the strategies; harmonisation across donor actions; ‘managing for results’; mutual accountability between donors and recipients (OECD, n.d.). It was strengthened by the Accra Agenda for Action (2008) (ibid) and the Busan Commitments (OECD, 2011), which prioritised actions to achieve the aims of the Paris Declaration, and emphasised inclusive partnerships and capacity building. The vast majority of CGIAR funders, member countries and partner organisations endorsed the Paris Declaration and subsequent commitments. Its influence can be seen in donor priorities shaping CGIAR’s reform (see section 7.3).

7.2.3.2. AGRA: A New Green Revolution for Africa

AGRA was set up by Rockefeller Foundation and BMGF in 2006 with the aim of increasing yields of a limited number of crops in 11 African countries (Toenniessen et al., 2008). It focuses on increasing agricultural productivity through providing improved seeds and fertiliser to smallholder farmers; on linking smallholder farmers to local and international markets; and on opening up African agriculture to external investment. Unlike the Green Revolution in Asia in the 1970s, provision of inputs is through market mechanisms rather than by state actors (Holt Giménez, 2008). It has set up a network of ‘agro-dealers’ to sell seed, fertiliser and other inputs to farmers, and developed a ‘private led extension model’ to encourage uptake of new seeds (AGRA, n.d.).

AGRA has also been active in lobbying to liberalise seed policies and reduce restrictions on the activities of private sector seed companies (ibid).

AGRA has been widely criticised by NGOs and food sovereignty advocates (e.g. Mayet, 2009). Critics considered that its focus on technology inputs was unlikely to address social, environmental and political problems facing African agriculture (Holt Giménez, 2008). They argued that opening up African agriculture to global agro-industry companies undermined smallholder livelihoods and closed down alternative options for strengthening Africa’s agriculture sector (Daño, 2008). More recently, research has shown that it has failed to produce the results it claimed, with no increase in agricultural productivity, and a significant increase in levels of hunger across the countries in which it operates (Mkindi et al., 2020).

7.2.3.3. World Development Report 2008 (WDR08)

The WDR, an annual World Bank publication, focused on agriculture in 2008 for the first time since 1982 (World Bank, 2007). It called for donors and national governments to pay greater attention to the sector after years of under-investment. It portrayed the agriculture sector as “...as an engine of growth...and of...poverty reduction...” (World Bank, 2007, p.26) in low-income countries (LICs), and called for “...a productivity revolution in smallholder farming...” (ibid p.1) to fuel this growth. It identified countries at different stages along a linear continuum towards ‘development’, describing ‘three worlds’ of agriculture – “...agriculture-based, transforming, or urbanized.” (ibid p.29) For all three worlds, it presented policy prescriptions based on increasing agricultural productivity, linking smallholders to markets (local and global) and increasing off-farm employment.

The report called for increased investment in agricultural research to boost productivity, emphasising the need for public investment in biotechnology. It argued that private sector investment in biotechnology had been directed to commercial agriculture and therefore public investment should focus on bringing biotechnology to poor farmers. It also called for ‘lower barriers to import and testing of new technologies’ (ibid p. 169), reinforcing AGRA’s call to open up African markets to biotechnology companies.

The report examined why ‘improved’ crop varieties had not been taken up in Africa. It suggested that factors included the range of crops grown in the region (for which improved varieties had not been developed), “...agroecological complexities and heterogeneity...”, and a “...lack of infrastructure, markets, and supporting institutions...” (ibid p. 160). To address these, WDR suggested the provision of better targeted improved varieties, more research on NRM and improvements in infrastructure and policies to address market barriers.

Critics challenged the WDR’s failure to interrogate the power of global agribusiness in shaping agriculture markets. It was criticised for failing to analyse

“...the complex impact of neoliberal policies, deregulation and the expansion of global agribusiness on agrarian markets and producers in Africa.” (Amanor, 2009, p.261)

Others, however, criticised its failure to consider the potential of new technologies to increase income inequalities. Its linear model of development was also challenged, along with its “...commitment to finding market mechanisms to allocate resources to those without purchasing power.” (Woodhouse, 2009, p.267)

7.2.3.4. International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD)

IAASTD was initiated in 2004 by the World Bank, with the remit of assessing the role of AKST in “...reducing hunger and poverty, improving rural livelihoods and facilitating environmentally, socially and economically sustainable development.” (IAASTD, 2009b, p.vii) It involved 110 governments and over 400 experts over three years (IAASTD, 2009b) and published its findings in 2009. It aimed to be an inclusive process, bringing together farmers’ groups, NGOs, governments and agro-industry representatives. It considered multiple functions of agriculture, not only productivity, focusing on the impact of technological developments on poverty, environmental and social sustainability and inequality (ibid).

IAASTD considered how the agri-food system might be re-shaped to meet the needs and interests of the poorest and most vulnerable, focusing on societal outcomes arising from agricultural innovations. It called for a radical reshaping of the global agri-food system to address the identified social and environmental priorities, which, it argued, had been ignored by economic and technological approaches focusing on productivity only.

“...despite significant achievements in our ability to increase agricultural productive capacity to meet growing demand, we have been less attentive to some of the unintended social and ecological consequences of our technological and economic achievements.” (ibid p.17)

IAASTD called for research and technology at all scales, considering different research needs for different social groups, where it might be produced, and by whom; and it raised questions about ownership of agricultural innovations. This contrasted with WDR08’s approach, which assumed a top-down process of technology development and transfer, with private sector involvement at all levels.

The final report was controversial, with agro-industry representatives withdrawing from the process and USA, Canada and Australia declining to endorse it (Feldman et al., 2010). However, it was hailed by many NGOs and proponents of farmers’ rights for challenging the increasing privatisation and financialisation of global agriculture and raising questions about power within the food system.

7.2.3.5. The 2007-11 food price crisis and responses to it

In 2007, food prices on global markets increased rapidly, leading to increased food insecurity for poor households in many food importing countries. Food prices decreased in 2009, but rose to even higher levels in 2011 (Wise and Murphy, 2012). The food price crisis led to renewed high-level policy interest in the functioning of the global agri-food system, which in

turn led to several global level initiatives to address problems identified as causing the crisis. These included responses from UN bodies, from G8, G20 and the World Bank, and from public-private alliances such as the World Economic Forum.

Those initiatives, and responses from NGOs and civil society groups, identified different short-, medium- and long-term problems with the global agri-food system and consequently proposed different solutions to address the problems. Some proposed short-term solutions to the immediate crisis, while others drew attention to underlying longer-term structural issues affecting the functioning of the global agri-food system, which they considered underpinned the crisis. While many different approaches were presented, the responses broadly fell into two main groups: either those supporting and reinforcing the dominant market-led paradigm for global food security, or those that challenged it.

Neo-liberal approaches included the G8 and G20 initiatives aimed at stabilising global markets for staple commodity crops (e.g. G20, 2011); GROW Africa, established by World Economic Forum (2011) and New Alliance for Food Security and Nutrition in Africa, set up by the G8 in 2012, which both aimed to attract private sector investment into African agriculture.

An alternative approach, which challenged the centrality of trade liberalisation in ensuring food security, was articulated by the newly revived UN Committee on World Food Security (CFS). This placed the right to food at the centre of its vision (FAO, 2009a), and engaged a wide range of stakeholders in formulating its position, including women's groups, farmers' organisations and CSOs. The UN Rapporteur on the Right to Food also challenged responses that focussed on increasing production without asking where, how and for whom food would be produced (e.g. De Schutter, 2008).

7.2.3.6. Actors and networks

The flurry of initiatives triggered by the food price crisis were led by different actors with different priorities. International public-private initiatives such as the New Alliance for Food Security and Nutrition in Africa and GROW Africa brought together a mix of public and private research institutes and deliverers of technology, supported by government and philanthropic funding.

These groups of actors interacted in linked ways across multiple initiatives to build 'discourse coalitions' (Hajer, 1997). For instance, DFID, BMGF, Rockefeller Foundation (all CGIAR donors) and CGIAR were 'partners' in AGRA. Syngenta Foundation (a CGIAR donor) and Syngenta Group both engaged in the New Alliance, for which CGIAR was an enabling partner (CGIAR

Consortium Office, 2013d). Key actors influencing policy directions in the global agri-food system, such as the World Bank, also played important roles in CGIAR.

These entanglements between different actors across multiple initiatives created a network of mutually reinforcing institutions, which excluded other actors and perspectives. They pursued a market-led productivist framing of agricultural development, and provided funding for agricultural research and technology inputs primarily directed towards increasing crop yields in commercial agriculture. They promoted private sector investment in agriculture in LICs and public-private partnerships to deliver the anticipated development outcomes.

CGIAR, funded by World Bank, BMGF and other donors aligned with market-led approaches, was an actor within those initiatives. It was also subject to (sometimes contradictory) pressures arising from donor priorities outlined in the Paris Declaration, such as aligning its work with development strategies of the countries in which it worked.

The WDR08 and IAASTD reports renewed donors' interest in the role of agriculture in development. They articulated contrasting perspectives on the governance and direction of the global agri-food system. CGIAR was able to leverage the international focus on food and agriculture to push for increased funding. In doing so, it aligned primarily with the analysis presented in WDR08, which was highly influential in shaping CGIAR's reform. However, alternative perspectives, such as those presented in IAASTD, also partly influenced the new structure through the design of some of the Research Programmes.

7.2.4. CGIAR's response to the food price crisis

CGIAR Centres responded to the food price crisis by drawing up an action plan (CGIAR Alliance Office, 2008b). This argued, in what might be thought an opportunistic way, that a cause of the food price crisis was under-investment in the agriculture sector in many LICs and a related lack of investment in agricultural research. The plan called for an immediate response of social protection programmes, food aid and nutrition programmes. It stated:

“To achieve a permanent solution to the current food crisis, however, requires more rapid spread of new technologies that offer farmers a proven and sustainable means of producing more food on less land and with less chemical fertilizer and water.” (ibid p.1)

The plan laid out actions that CGIAR Centres would take to accelerate their ongoing work to help to address the crisis. It also laid out longer term actions that Centres would develop alongside partners and donors.

IRRI's Director General, Robert Zeigler, presented these ideas for short-, medium- and long-term responses to Exco14 (2008). In his presentation, he framed the crisis as arising from a failure to maintain research funding and stressed the need to re-focus research on productivity increases.

At the same time as the food price crisis was unfolding in late 2007, CGIAR initiated yet another reform process (see section 7.3). Although this process had its origins in long-standing governance and funding issues, by late 2008, the food price crisis was cited as a reason for reform (CGIAR Secretariat, 2008).

Discussion of the crisis at System level was limited, and the organisational response was passed on to IFPRI (CGIAR Secretariat, 2008), which undertook research monitoring the impacts of the crisis and proposed global policy responses (CGIAR Secretariat, 2009a). IFPRI's data and policy recommendations influenced both the UN and G8 policy decisions. IFPRI also worked with the Centres to develop a paper on 'best bets' for funding agricultural research (von Braun et al., 2008).

That paper, which was essentially a funding pitch for CGIAR, noted the variety of factors that contributed to food price rises, but asserted that they were underpinned by a failure to invest in agricultural research, which had resulted in declines in yield growth. CGIAR therefore portrayed itself as uniquely able to address the problems that had created the food price crisis, and its proposed reforms as essential to enable it to do so.

“...the system cannot effectively address these global challenges without additional funding and improved organizational design. The latter is being addressed by an ongoing change process. The former is the focus of this paper, which examines what can be expected from a scaled-up CGIAR.” (von Braun et al., 2008, p.v)

The paper presented an assessment of the impact of increasing global investment in agricultural research (and doubling funding to CGIAR as part of that) on agricultural production and poverty reduction; and assessed the impact of increased research investment on global food prices. Using these models, IFPRI predicted reduced poverty levels and reduced staple crop prices as a result of research investments. The paper then presented 14 'best bets' for research investments, covering increasing productivity of different agricultural systems, reducing risks including pests and diseases, managing climate change, supporting ecosystems, improving nutrition, germplasm exchange, markets and value chains. These 'best bets' were later developed into the CGIAR Research Programmes that were established as a result of the reform process (see section 7.3.3).

7.3. Governance issues – the 2008-11 reform process

The 2001 reform process sought to address stakeholder concerns about several issues including accountability of Centres to funders, financial stability, effective partnership working, and the quality and focus of CGIAR's research. The period from 2001 to 2007 saw an almost continuous process of organisational change and reform in CGIAR as the System managers tried to create greater programmatic and structural coherence (called 'alignment') across the Centres, and among donors (see section 6.4.2.1). A new CGIAR Chair – Kathy Sierra – was appointed in October 2006. As with all CGIAR Chairs, she was a World Bank Vice President. In May 2007, she chaired an 'Alignment Forum' at which it was decided that a new change process was needed (CGIAR Secretariat, 2007b). At the same time, the World Bank initiated a review of CGIAR as required by its funding processes.

ExCo12 established a Scoping Team, made up of internal CGIAR stakeholders, to decide on the parameters of the change process. This Scoping Team presented its proposal for a Change Management Process to the 2007 AGM, where it was approved.

7.3.1. Reasons for reform

Despite the organisational changes between 2001 and 2006, by 2007, little progress had been made on any of the problems CGIAR faced. First and foremost, donors remained dissatisfied with CGIAR's lack of efficiency and effectiveness, and continued to fund Centres bilaterally or

Box 7.2 Changes in funding levels 1997 - 2010

The 2008-11 reform aimed to address the “quiet financial crisis” (CGIAR Independent Review Panel, 2008, p.4) facing the Centres by increasing funding, improving the alignment between funding commitments and agreed research priorities, and reducing the proportion of funding allocated to specific projects (i.e. restricted funding that could not be used for general costs). This had been steadily rising, from 30.7% of total funding in 1991 to 64% in 2008 and 68% in 2012 (CGIAR Consortium Office, 2013b).

However, overall funding increased. Between 1997 and 2007, funding increased 24% in real terms (adjusted for inflation). Between 2008 and 2012, it increased by 50% (Calculations based on data from: IFPRI, 2020).

There was also a significant change in the donor group. The Bill and Melinda Gates Foundation (BMGF), which had been making bilateral donations since 2004 (HarvestPlus, 2020), became a CGIAR member in 2010, becoming the second largest single contributor to CGIAR, behind the USA (CGIAR Consortium Office, 2011).

	1997	2009	2010
Key donors	% of total funding	% of total funding	% of total funding
Industrialised countries	72.3%	62.5%	59.4%
Developing countries	3.5	4	4
International and regional bodies	20	16.5	11.9
Non-members / other	2.6	16	13.3
Foundations	1.7	0.9	11.3 (10.6 from BMGF)

Prior to the reform, the largest proportion of funding went to crop genetic improvement programmes (37% in 2007). NRM expenditure was 11% of the total in 2007, and policy research was 17% (CGIAR Independent Review Panel, 2008). While a direct comparison is difficult, because CRPs encompassed a range of work, the budgets for the CRPs focusing on crop genetic improvement amounted to 46% of the total in 2012.

Figures derived from CGIAR Consortium Office (2013b)

for specific projects. This approach led Centres to align their research priorities with donor interests, diverting their research programmes from their core mission and becoming “...prisoners of their own logic of survival.” (CGIAR Science Council, 2008a)

Interviews with internal stakeholders, conducted by the Scoping Team, highlighted the level of dissatisfaction with elements of CGIAR's performance in 2007. For instance, there was blanket disagreement, across donors, Centres, partners and the SC, with statements such as “the

Centers are sufficiently accountable to the System”; “there is a clear process for decision-making across the system” or “the CGIAR Partnership with NARS is adequate” (Change Management Scoping Team, 2007b, p.17).

All stakeholders also recognised that reporting and financing structures within the System were complex and bureaucratic:

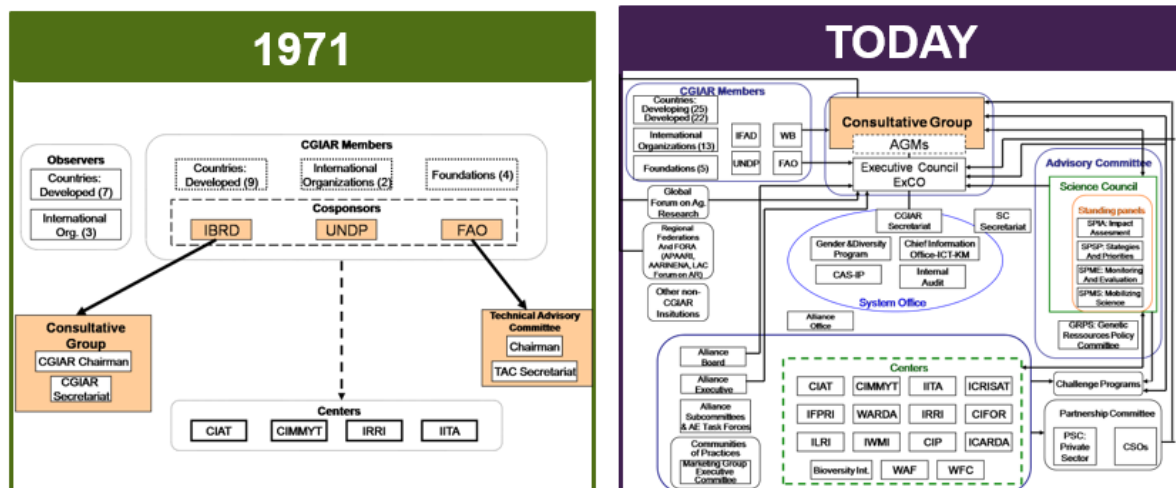


Figure 7.1 CGIAR Structure 1971 and 2011

Source: Le Page (2011)

The Scoping Team outlined what it saw as the reasons that change was needed and outlined the problems the reform was intended to solve. The Scoping Team proposal stated:

“...it is self-evident that CGIAR must revitalize and reposition itself in response to megatrends and changing context.” (Change Management Scoping Team, 2007b, p.1)

These external trends were listed as changing understandings of the role of agriculture in economic development and in food systems; and changing the IAR arena with both new funders and new research providers. Later CGIAR documents stressed other external factors as justification for the reform. For instance, by October 2008, the change process was being presented as a response to the global food price crisis and climate change. However, CGIAR’s internal problems were the strongest driver of change, with donors, led by the World Bank, pushing for significant reform.

Internal problems identified by the Scoping Team included a lack of clarity regarding CGIAR’s mission and role; poor governance of Centres; lack of coordination across Centres and between donors; unclear lines of accountability for use of funds; and poor prioritisation of research work. Former and current CGIAR Chairs were concerned that these problems left CGIAR unable to present a collective voice in international fora where decisions that directly

affected its work were being taken. CGIAR's lack of focus also meant its place within the wider Agricultural Research for Development (AR4D) framework was unclear, hindering relationships with other AR4D actors including NARS (Reifschneider et al., 2007).

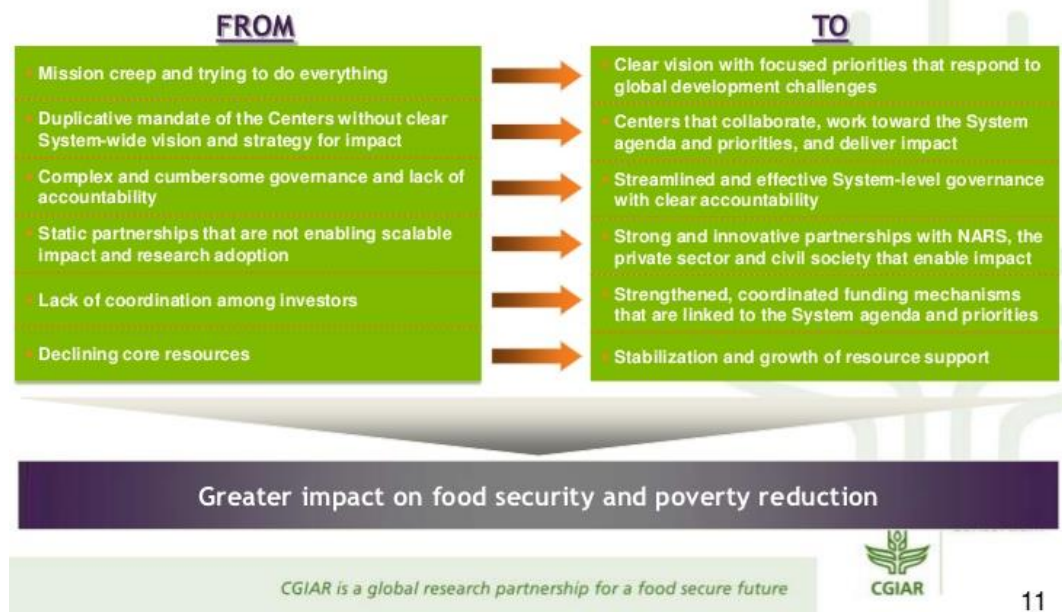
Interviews conducted for this thesis with internal and external stakeholders (see Appendix Three) confirmed that there was a consensus on the need for reform. However, there was little agreement on what were the problem(s) the reform should address, or the hoped-for outcomes of the process. For instance, while donors agreed that CGIAR had to demonstrate 'impact', there were different interpretations of how 'impact' should be defined and measured.

There was agreement across all interviewees that the process was donor led, with some specifically identifying the World Bank as taking the lead alongside a 'clique' of people from banking and financial (rather than agriculture or research) backgrounds (I7). There was also agreement that CGIAR hoped the reform would increase and stabilise funding. Donor representatives (I6, I9, I13) reported hoping that the reform would bring more clarity on research priorities and make CGIAR more efficient. However, Centre staff and donor representatives both recognised that donors had different priorities and different perspectives on what needed to change (I13), with some donors keen to support new approaches, and others backing CGIAR's more traditional work (I16/2). Similarly, some internal and external stakeholders hoped that the reform process would open up CGIAR to new partnerships and new ways of working, strengthening participatory and on-farm programmes (I2/1, I15/2), while others saw opportunities for CGIAR to engage more with private sector actors (I9, I14). These different interests and priorities informed positions taken by stakeholders in debates about how the reform should be enacted, with policy development on IP proving particularly controversial (see section 7.5).

Therefore, there were many competing problems that the reform was expected to address, and pressures in different directions as the reform process developed.

The CGIAR System officers leading the process characterised the desired outcomes from the reform as in the graphic below:

Desired outcomes of CGIAR Reform



11

Figure 7.2 Desired outcomes of CGIAR reform

Source: Le Page (2011)

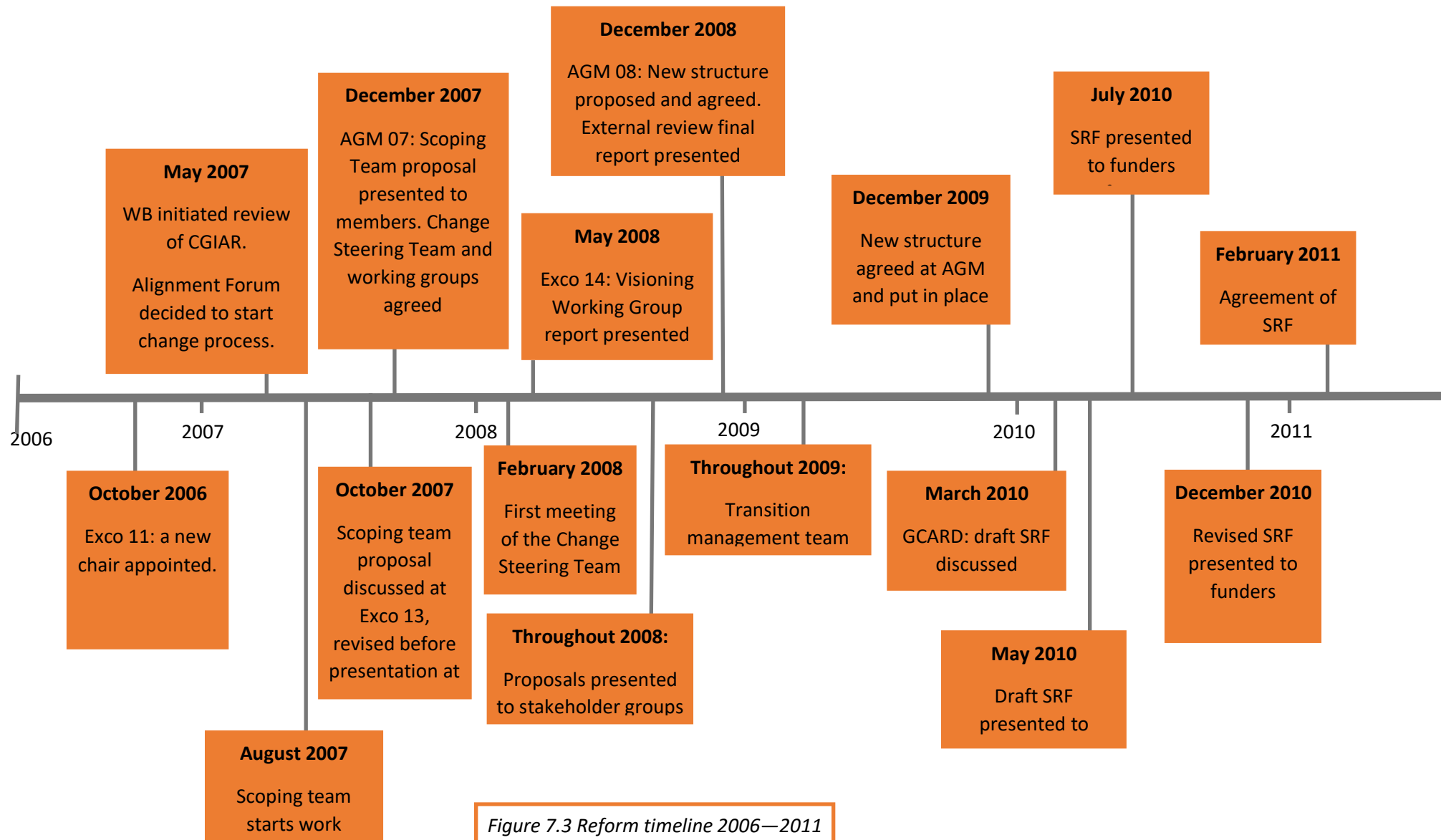
7.3.2. Process of the reform

The Scoping Team was made up of ExCo members alongside representatives of the Centres, the SC and a partner organisation (CGIAR Secretariat, 2007b, p.vi). The process was therefore shaped and led by internal actors. Nonetheless, the Scoping Team proposed a far-reaching reform process, identifying four areas where they considered change was necessary:

- “Research priorities and programs” (CGIAR Secretariat, 2007a, p.20) – later recast as vision and strategy.
- Building partnerships
- Funding mechanisms
- Governance at both System and Centre level.

The Scoping Team also stressed the need to create a new culture of trust and collaboration across the System, proposing informal actions to change CGIAR’s work culture to build “trust and empathy” (Change Management Scoping Team, 2007a, p.2).

The team presented its proposals at the 2007 AGM (see Figure 7.4), following which a Change Steering Team (CST) was set up. This was again made up of CGIAR members. The CST created



four working groups covering Vision, Partnerships, Governance and Funding. These working groups (WGs) had wider membership, including representatives of NARS and regional fora.

The World Bank-commissioned external evaluation of CGIAR was also initiated in May 2007 (CGIAR Secretariat, 2007b). The terms of reference for the evaluation were drawn up by ExCo members, and it worked with the Scoping Team and subsequent working groups to ensure coordination and “mutually supportive” outcomes (Change Management Scoping Team, 2007a, p.4). This meant that there were commonalities across the recommendations of the two processes, both of which were heavily influenced World Bank interests. Even so, the final report of the external evaluation panel was subtitled an ‘Independent Review of the CGIAR System’, but without specifying of what and/or whom it was independent.

The reform was driven by the System offices, with Centre staff barely involved (CGIAR Fund Office, 2011b). Steering Team members informed external stakeholders (such as NARS, regional fora, private sector and civil society organisations) of developments in the reform process through presentations at meetings and through newsletters (e.g Sierra et al., 2008a; Sierra et al., 2008b). In addition, the Global Conference on Agricultural Research for Development (GCARD) in March 2010 considered the CGIAR reform process, enabling some input into the process from a broad constituency.

However, some aspects of the direction of the reform were set at a very early stage, before consultation beyond the Steering Team took place. For instance, the Visioning WG was tasked with setting the frame for major reform in CGIAR, but its terms of reference defined elements of that frame before it started. Its role was to:

“1) explore and identify the most relevant development goals and challenges for the CGIAR; 2) develop a new vision for the CGIAR and refine its mission, 3) propose a set of measurable strategic objectives for the CGIAR that are closely linked to the development challenges, and 4) provide guidance to the other WGs on developing appropriate business models in support of the revised mission, vision and strategic objectives.” (CGIAR Change Steering Team, 2008b, p.3)

The Visioning WG defined ‘business model’ as “...a description of how the CGIAR will implement its Strategic Objectives, including partnership requirements and the use of alternative suppliers [of research].” (ibid p.6) At that stage, other elements of a business model such as availability and use of resources were not considered.

The concept of working in partnership with non-traditional CGIAR stakeholders was therefore established as part of the design of the new system from a very early stage.

This call for partnership working addressed the contradictory call from donors for CGIAR to be able to demonstrate the development outcomes of its work, at the same time as focusing on

core competencies and established areas of expertise. The Independent Review stressed the importance of delivering (rather than only producing) international/global public goods (I/GPGs) to ensure impact (CGIAR Independent Review Panel, 2008). To do this, CGIAR needed to develop partnerships because it did not have the capacity itself to reach end-users. This GPG-based rationale for the reform is discussed in section 7.4.4.

The Independent Review recognised NARS' past role as CGIAR's core partners and encouraged CGIAR to strengthen those relationships. However, they considered that reduced investment in public sector agricultural bodies in many LICs (often because of World Bank-supported 'structural adjustment programmes') meant that public sector partners no longer had the capacity to deliver research outputs to farmers. New partnerships, including those operating through market mechanisms, were therefore needed.

The Visioning WG stated that:

"...the range of partners for the CGIAR in the future will be much more varied than in the past, and will include not only traditional partners such as national research programmes, advanced research institutes (ARIs), international agencies and the UN, but also newer ones such as private-sector companies, other ARIs, development agencies, non-government organizations (NGOs), civil society organizations (CSOs) and producer organizations, both in developing and developed countries." (CGIAR Change Steering Team, 2008b, p.16)

In the light of this, the new structures that emerged from the reform process were designed to facilitate the opportunity to develop such new partnerships.

The Visioning WG expressed a further pivotal assumption underpinning the reform by stating that:

"...science, technology and research are key drivers of development." (ibid p.24)

This placed CGIAR's core work at the centre of agricultural development strategies, providing a rationale for continued donor support despite all CGIAR's limitations.

In addition, the Visioning WG based its work on a premise that CGIAR's agenda should be set by market forces:

"With the development of markets and integrated supply chains, innovation becomes less driven by science (supply side) and more by markets (demand side)." (ibid p.7)

This conceptualisation of 'demand' did not differentiate between groups of farmers (e.g. commercial or small-scale), and did not acknowledge that poor farmers are rarely able to express their interests by exerting market demand.

Throughout 2008, the core elements of a new system were discussed in the working groups, in ExCo meetings and in Alliance Board meetings. The Alliance contributed its own proposal for a new structure (CGIAR Alliance Office, 2008a), which was discussed in August 2008 alongside the proposals made by the Governance WG and the Independent Review. However, ExCo decided on the option developed by the Independent Review i.e. the option preferred by the World Bank.

The CST presented the new CGIAR vision and proposed new structure to Members at the 2008 AGM (CGIAR Change Steering Team, 2008a). The vision proposed three strategic objectives:

“FOOD FOR PEOPLE: Create and accelerate sustainable increases in the productivity and production of healthy food by and for the poor

ENVIRONMENT FOR PEOPLE: Conserve, enhance and sustainably use natural resources and biodiversity to improve the livelihoods of the poor in response to climate change and other factors

POLICIES FOR PEOPLE: Promote policy and institutional change that will stimulate agricultural growth and equity to benefit the poor, especially rural women and other disadvantaged groups.” (ibid p.4)

This formulation was intended to focus CGIAR’s research agenda onto ‘people’ – “...especially the poor, women and the marginalized.” (CGIAR Change Steering Team, 2008b, p.14) where ‘the poor’ are defined as “...producers and rural and urban consumers. The rural poor include smallholders and wage laborers.” (ibid p.15)

While this approach put ‘people’ rather than science at the centre of CGIAR’s objectives (rhetorically at least), it nonetheless enabled CGIAR to focus generically on ‘poverty reduction’, which could be interpreted in multiple ways.

The Visioning WG laid out a new approach for the delivery of GPGs, describing the concept of ‘impact pathways’ through which CGIAR’s research activities would contribute to the achievement of the three strategic objectives (ibid p.16). The impact pathways would define how CGIAR’s research outputs would lead to development outcomes, including which partnerships CGIAR would develop with organisations working at different levels along a putative research-development continuum. The model envisaged CGIAR operating within a wider AR4D system, building different partnerships for each new research programme. This approach is discussed in more detail in section 7.4.4 on GPGs.

The Change Steering Team presented nine elements of the new system that would enable delivery of the objectives. These were:

- A Fund to provide stable financing
- Funding streams for programmes and for institutional costs
- A Consortium of Centres, which would be a legal entity
- Performance contracts between donors and Centres
- Research programmes developed within an overarching 'Strategy and Results Framework'
- The development of new partnerships
- An Independent Science and Partnership Council, replacing the Science Council
- An independent evaluation arrangement to evaluate the research programmes
- Revision of CGIAR's founding principles (CGIAR Secretariat, 2008, p.9).

The founding principles were reworked as:

Existing Principles	The Change
Donor Sovereignty	Donor harmonization
Center Autonomy	Significantly reduced with greater System coherence
Decision Making by Consensus	Replaced by new decision rules and Performance Contracts
Independent Scientific and Technical Advice	Integrated Independent Science, Partnership and Development Outcome Advice

Figure 7.4 Revision of founding principles

Source: CGIAR Change Steering Team (2008a, p.7)

This reduced the power of Centres, and their scientists, to set the research agenda, and consolidated power in the new System bodies.

The proposed new structure was presented to donors at the 2008 AGM:

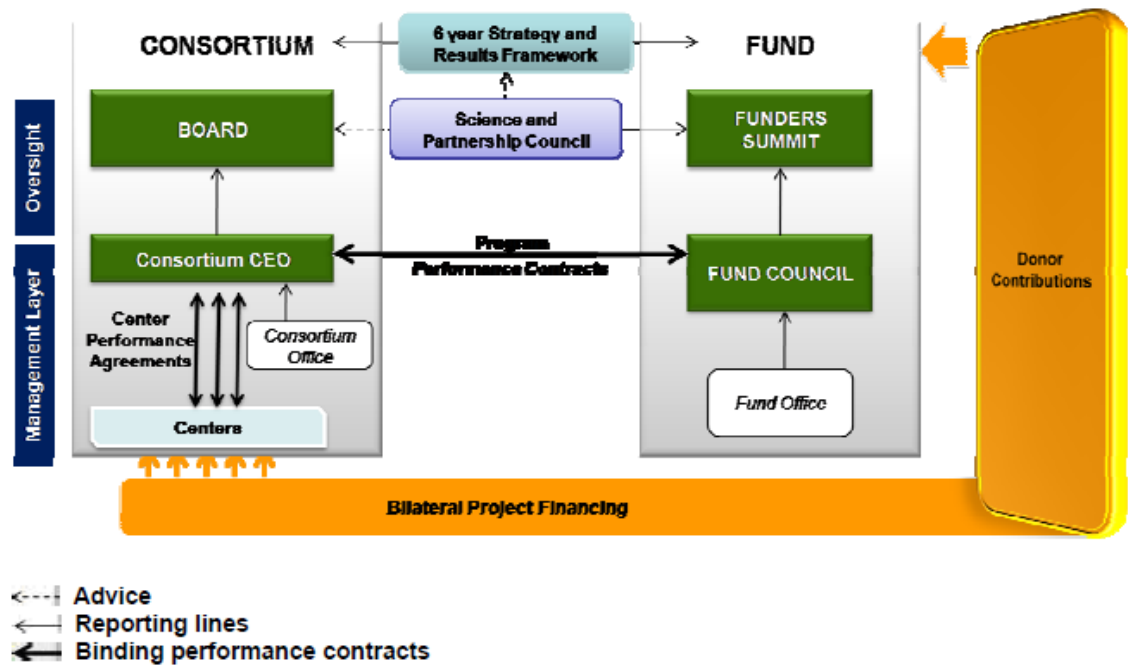


Figure 7.5 Proposed new CGIAR structure

Source: CGIAR Change Steering Team (2008a, p.8)

Donors raised several concerns about the proposal. They were concerned about lines of accountability between Centres and the Consortium; how (or whether) CGIAR might be accountable to 'the poor' or their representative bodies such as farmers' organisations; the legal status of, and arrangements between, the new bodies such as the Consortium and Centres; costs of the new structure; conflicts of interest within the ISPC, which had both advisory and evaluation roles; diversity and representation on the Fund Council (CGIAR Secretariat, 2008).

However, the reform proposal was approved at AGM 2008, agreeing a new structure for CGIAR before mechanisms for its implementation had been devised. A Transition Management Team was established, with the task of developing a Strategy and Results Framework (SRF) and a portfolio of research programmes; and clarifying funding mechanisms, legal structures and lines of accountability between the different elements of the new structure. It undertook this work throughout 2009 (CGIAR Secretariat, 2009b). Minutes of ExCo meetings reveal conflicting interests and priorities between Centres, different donors, System officials and other stakeholders.

For instance, clarity over lines of accountability between Centres and the Consortium remained a problem (CGIAR Secretariat, 2009c). Exco asked the Centres to "...accept the supremacy of the Consortium Board..." on certain issues. However, some Centre Board

members were concerned that to do so would leave them unable to fulfil their legal responsibilities as Centre Trustees (CGIAR Secretariat, 2008). This fight over the balance of power between the Centres and the Consortium continued throughout the Consortium's existence.

Funding was another area of disagreement. Centres wanted donors to commit funds for programmes developed to fit into the new structure, but donors wanted more confidence that the new approach would deliver the results they hoped for (CGIAR Secretariat, 2009c), before committing their funds. Donors were concerned that the new CGIAR Research Programmes (CRPs) essentially re-packaged existing work under new headings and did not represent a significant change in research priorities or ways of working (ibid).

A further area of concern for Members was about relations with the Global Forum on Agricultural Research (GFAR). The reform proposal mentioned the importance of GFAR as a partnership body, stressing its role in connecting CGIAR into the wider AR4D field. However, it was not given a role on any decision-making bodies (CGIAR Secretariat, 2008).

Finally, some donors were concerned that the changed criteria for a place on the Fund Council (see section 7.3.4) would skew membership towards rich countries and private foundations; and that funding mechanisms were complex and unclear.

The new structure started operating in early 2010. The new Fund Council met for the first time in February 2010, while the Consortium Board met in March 2010. However, many elements of the System were still under construction. The SRF was not agreed until early 2011 and a portfolio of research programmes was in place by the end of 2012 (CGIAR Consortium Office, 2013b). Debates about the implications of the new structure and the balance of power between its different elements therefore continued throughout 2010 and 2011.

The logic of the new structure was that research programmes would address the agreed strategic objectives and together make up a coherent portfolio of research activities to achieve the impact outlined in the SRF. However, the process of developing the SRF took place at the same time as Centres were designing research programmes, and Centres were keen to ensure continuity of funding for work that they were already doing. This meant that CRPs were designed before the priorities were agreed. The newly formed Independent Science and Partnership Council (ISPC) was critical of this process, questioning whether CRPs were genuinely demand-driven and focused on identified development challenges rather than repackaging existing work; and whether they were designed for impact or for institutional survival for the Centres (CGIAR Independent Science and Partnership Council, 2010).

The draft SRF laid out the idea of 7 ‘mega-programmes’ (von Braun et al., 2009). These were later re-labelled ‘thematic areas’ under which the expanded portfolio of 15 CGIAR Research Programmes (CRPs) were grouped. A further CRP on genebanks was developed in 2011 (see Table 7.1).

At this stage, separate platforms for gender and capacity building were envisaged.

7.3.3. The new structure

HOW THE NEW CGIAR WORKS

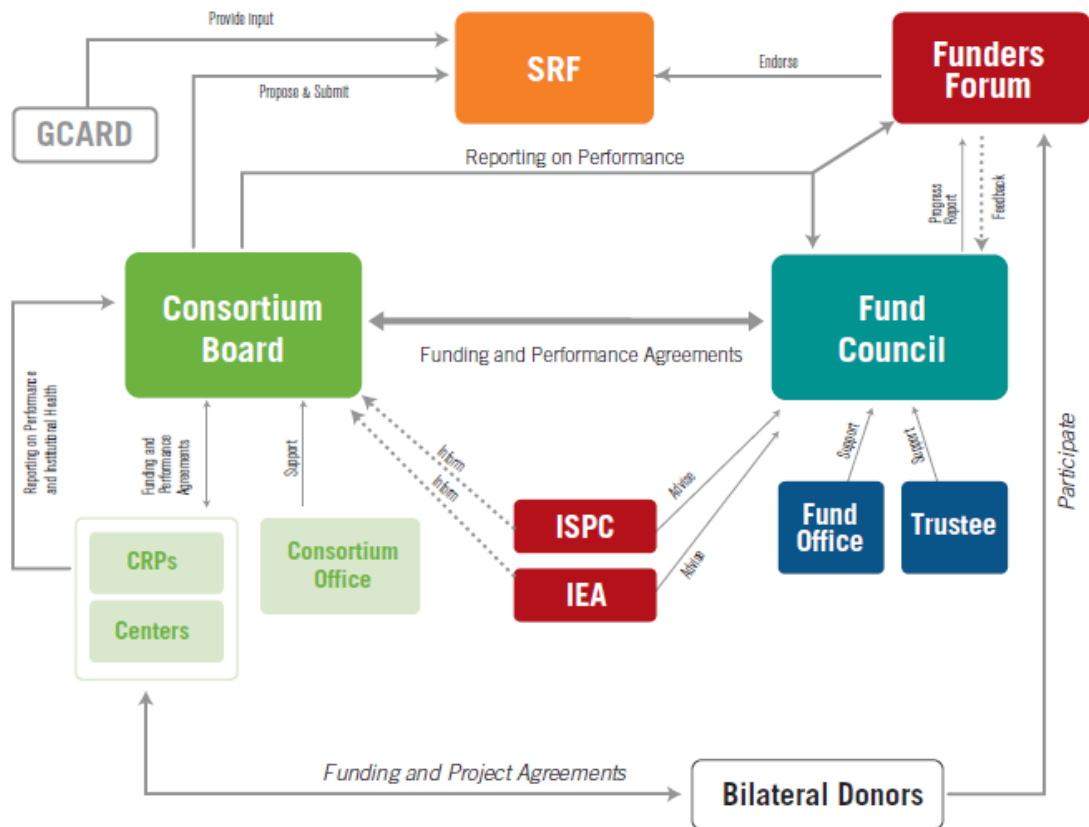


Figure 7.6 The new CGIAR structure

Source: Ozgediz (2012, p.88)

The core claim for the new structure was that CGIAR's model shifted from one in which individual Centres pursued their own work, to one in which they worked together in a co-ordinated way to achieve a shared vision and goals (CGIAR Consortium Office, 2011a).

The key elements of the new structure were:

- *Separation of 'doers' and 'funders'*

'Doers' were coordinated by the Consortium. They were entities working with Centres on Research Programmes, such as NARS, other research institutions, private sector actors or NGOs.

'Funders' were embodied by the Fund Council, which became the Fund's decision-making body (CGIAR Secretariat, 2009d). Membership was based on the size of financial contributions to CGIAR. Regional research fora were also represented, along with multilaterals (e.g. FAO), foundations and GFAR. The Funders Forum was a broader mechanism including donors, Centre host countries, regional bodies and potential funders.

- *Connecting mechanisms between the 'doers' and 'funders'*

These included the SRF, GFAR, the ISPC and various operational frameworks covering evaluation, contracts and dispute resolution (ibid).

- *New funding mechanisms*

Although one of the core reasons for the reform was to coordinate donor funding and direct it more effectively to agreed research priorities, the new structure gave donors the option to fund CGIAR's work through three 'windows'.

- Window 1: unrestricted funding
- Window 2: funding for specific CRPs.
- Window 3: bilateral funding to specific Centres. The Consortium and Fund Council did not have oversight of these funds. Window 3 was planned as a transitional funding stream, on the expectation that donors would move to funding the CRPs directly.

- *Strategy and Results Framework*

This set development objectives, called 'System Level Outcomes' (SLOs), towards which all research activities should contribute:

- reducing rural poverty
- improving food security
- improving nutrition and health
- sustainable management of natural resources.

- *CGIAR Research Programmes (CRPs)*

CRPs were designed to be the mechanism through which all research activities were organised – "...the operational arm of the SRF..." (CGIAR Fund Office, 2011a, p.3). Pre-existing Challenge Programmes (CPs) were incorporated into the new CRPs. 15 CRPs were agreed during 2011 (see table 7.1), with a CRP supporting the 11 genebanks developed in 2012. Some CRPs focused on production systems ('system' CRPs) while others focused on a specific crop (commodity CRPs).

- *New legal status*

The Consortium was established as an “international organization” (CGIAR Fund Office, 2010a), rather than only Centres having legal status.

- *World Bank as sole ‘Trustee’*

In the new structure, the co-sponsor roles of FAO and IFAD were abolished, and the World Bank took several roles. It was a donor – and therefore a Fund Council member. It was also the ‘Trustee’, channelling funds from other donors through the Windows. It provided office space and staffing for the Fund Office, and the Executive Secretary of the Fund Council was a World Bank employee. World Bank control over CGIAR was therefore extended (ibid).

Other changes included abolishing ExCo, GRPC and AGMs; and the creation of a legal unit within the Consortium Office to support Centres with IP and other legal issues arising from the new partnership arrangements within CRPs.

Table 7.1 CRPs list

Theme	CRP	Lead Centre (participating Centres)	2012 expenditure (US\$ millions)
1. Integrated Agricultural Systems for the Poor and Vulnerable	CRP 1.1 Integrated Agricultural Production Systems for the Poor and Vulnerable in Dry Areas	ICARDA (Bioversity International, CIAT, CIP, ICRAF, ICRISAT, ILRI, IWMI, and WorldFish and incorporating the Sub-Saharan Africa Challenge Programme)	30.5
	CRP 1.2 Humidtropics: Integrated Systems for the Humid Tropics	IITA (Bioversity International, CIAT, CIP, ICRAF, ILRI, and IWMI and the World Vegetable Center (AVRDC), the International Centre of Insect Physiology and Ecology (icipe), and other partners)	20.0
	CRP 1.3 Harnessing the Development Potential of Aquatic Agricultural Systems for the Poor and Vulnerable	WorldFish (Bioversity International, CIAT, and IWMI)	20.1
2. Policies, Institutions and Markets to Strengthen Assets and Agricultural Incomes for the Poor	CRP 2 Policies, Institutions, and Markets to Strengthen Assets and Agricultural Incomes for the Poor	IFPRI (Bioversity International, CIAT, CIMMYT, CIP, ICARDA, ICRAF, ICRISAT, IITA, ILRI, IWMI, and World Fish)	75.1
3. Sustainable Staple Food Productivity	CRP3.1 WHEAT -- Global Alliance for Improving Food Security and the	CIMMYT (ICARDA, ICRAF, IFPRI, IRRI, and the CGIAR Generation	40.7

Increase for Global Food Security	Livelihoods of the Resource Poor in the Developing World	Challenge Program, the CGIAR Research Program on Climate Change, Agriculture and Food Security, and the CGIAR HarvestPlus Challenge Program and other partners)	
	CRP 3.2 MAIZE -- Global Alliance for Improving Food Security and the Livelihoods of the Resource Poor in the Developing World	CIMMYT (CIAT, ICRAF, ICRISAT, IFPRI, ILRI, IRRI, and the CGIAR Generation Challenge Program, the CGIAR Research Program on Climate Change, Agriculture and Food Security, and the CGIAR HarvestPlus Challenge Program and other partners)	74.2
	CRP 3.3 Global Rice Science Partnership (GRiSP)	IRRI (AfricaRice and CIAT and the CGIAR Generation Challenge Program, the CGIAR Research Program on Climate Change, Agriculture and Food Security, and the CGIAR HarvestPlus Challenge Program and CIRAD, IRD, JIRCAS, and other partners)	99.0
	CRP 3.4 Roots, Tubers and Bananas for Food Security and Income	CIP (Bioversity International, CIAT, and IITA)	51.2
	CRP 3.5 Grain Legumes for Health and Prosperity	ICRISAT (CIAT, ICARDA, and IITA, the CGIAR Generation Challenge Program, and the World Vegetable Center (AVRDC) and other partners)	22.4
	CRP 3.6 CGIAR Research Program on Dryland Cereals: Food Security, Better	ICRISAT (CIMMYT, ICARDA, the CGIAR Generation Challenge	7.4

	Health, and Economic Growth for the World's Most Vulnerable Poor	Program, and ILRI and CIRAD and other partners)	
	CRP 3.7 More Meat, Milk and Fish by and for the Poor	ILRI (CIAT, ICARDA, and WorldFish)	15.9
4. Agriculture for Improved Nutrition and Health	CRP 4 Agriculture for Improved Nutrition and Health	IFPRI (Bioversity International, CIAT, CIMMYT, CIP, ICARDA, ICRISAT, IITA, and IRRI and other partners)	37.4
5. Durable Solutions for Water Scarcity and Land Degradation	CRP 5 Water, Land and Ecosystems	IWMI (Africa Rice, Bioversity International, CIAT, CIP, ICARDA, IITA, ICRAF, ICRISAT, IFPRI, ILRI, IRRI, IWMI, and WorldFish and the CGIAR Challenge Program on Water and Food)	55.9
6. Forests and Trees	CRP 6 Forests, Trees and Agroforestry: Livelihoods, Landscapes and Governance	CIFOR (Bioversity International, CIAT, and ICRAF)	71.2
7. Climate Change, Agriculture and Food Security	Climate Change, Agriculture and Food Security	CIAT (AfricaRice, Bioversity International, CIFOR, CIMMYT, CIP, ICARDA, ICRAF, ICRISAT, IFPRI, IITA, ILRI, IRRI, IWMI, and WorldFish)	62.9
	Genebanks		15.9

Sources: CGIAR Consortium Office (2011d); CGIAR Consortium Office (2013b)

7.3.4. Different internal and external perspectives on the reform

- *Coordination of research*

The reform process was initiated to address several perceived problems. Stakeholders recognised its success at addressing some, though by no means all, of them. There was some consensus across interviewees that the new structure enabled better co-ordination across Centres, with some donors, partners, Centre staff and System officers (I2/1, I5, I6, I10, I16/2) agreeing that the CRPs increased collaboration and created a mechanism for implementing system-wide research agendas. However, several stakeholders observed that a linear, top-down model of research remained intact within most CRPs (I2/2, I3, I8) as did CGIAR's traditional focus on productivity (I12, I15/2). Although the results and impact agenda shifted focus onto getting products out to farmers ('research into use'), this did not extend to developing participatory programmes or farmer-led research (I15/2).

The CRPs meant Centres had to develop new ways of working, with the systems CRPs in particular requiring radical new approaches, explicitly focussing on development outcomes (I2/1). The relationship between CRP work programmes and achievement of the SLOs required a new conceptualisation of CGIAR's role in a research-to-development continuum and in a GPG delivery framework (see section 7.4.4). Some Centres and donors were enthusiastic about this shift, seeing this as an opportunity for CGIAR to move in a different, farmer-focussed direction (I12). Others struggled to understand the ideas behind it and continued to support familiar work through the commodity CRPs (CGIAR Fund Office, 2011a).

- *Relations between different parts of CGIAR*

The new organisational structure did not resolve tensions and conflicting interests between the Centres and the System. Internal and external stakeholders saw the process of agreeing CRPs as highly political, with Centre directors negotiating for their institutional survival (I3, I12, I15). Some staff saw the CRPs as an additional bureaucratic layer (I11) imposed from the top. Others questioned how concentrating control over direction and policies at System level could facilitate a decentralised approach to co-designing impact pathways with new partners (I2/1).

There was some consensus amongst interviewees that the Consortium model was not successful (I5, I6, I7, I13) as it was supposed to both represent the Centres and manage them. It was not strong enough to impose a strategic approach on Centres (I5, I6) and tension remained between System priorities and Centre interests (I10, I9). One donor considered that

the twin governance structure could not work because ultimately donors, represented by the Fund Council, had a clear incentive to ensure funds were well-spent (I6), while lines of accountability between the Consortium and Centres were not well-defined (I7).

- *Funding*

Diverse Centre interests were mirrored by donors holding different priorities (I3, I10). While donors were able to agree on an outcome-focused approach, they had different understandings of desired outcomes and the partnerships needed to achieve them. The divisions remained between donors who prioritised NRM and downstream development-oriented programmes and those who prioritised genetic improvement (I8). This resulted in different elements of CGIAR's work being funded by donors with contrary, and sometimes contradictory, interests.

Other terms were also understood in diverse ways: for instance, GFAR might consider 'partners' to be farmers or NGOs, while Centre scientists sought partnerships with universities or private sector actors (I8). Donors also understood 'impact' in different ways (I2/1, I8), creating difficulties for designing relevant metrics to measure impact across very different programme portfolios. This was a particular problem for system CRPs for which simple metrics such as seed production were inappropriate.

Some donors were legally bound to fund on a project basis and could not contribute to Window 1 (CGIAR Fund Office, 2010a; I6). Others chose to retain bilateral relationships with Centres. As a result, a large proportion of funding remained restricted and time-limited, and funding remained insecure (I16/2).

Donors also questioned the efficiency of the new structure. The reform process itself was hugely costly (I10), and the CRPs added an extra bureaucratic layer (I13, I9). CGIAR did not become more efficient or responsive as a result of the reform (I6, I9) and relevant stakeholder groups still operated outside formal decision-making structures (I6). It did not enable System oversight of Centre governance, and poor governance continued to be a problem (CGIAR Fund Office, 2012b). Additionally, staff (I3, I5, I8) and donors (I6, I9) questioned whether the results-based approach had improved System prioritisation. The reform did not cut any areas of work and the SRF did not provide guidance on research priorities because it included all areas of existing work.

The reform did, however, bring a change in the make-up of the donor community. The new structure changed CGIAR members to donors, and gave seats on the Fund Council to donors

who contributed above a set amount. This gave more influence to larger donors, including BMGF.

- *Business model and results orientation*

NGO groups were particularly concerned by this change, which they saw as entrenching a corporate business model in CGIAR's structure (I15/2). They were concerned that CGIAR's agenda was being set by private ostensibly-philanthropic foundations that favoured partnerships with private sector actors to deliver research products to farmers (ETC Group, 2012), because foundations such as BMGF are not publicly accountable for their policy decisions. Their influence over a public body such as CGIAR was therefore a concern for NGOs, farmer groups and their representatives. Donors such as USAID and the World Bank also supported public-private partnerships and a model of agricultural development predicated on opening up markets in LICs to private actors. This narrative of market-led development was contested by CGIAR stakeholders including GFAR but such groups struggled to get their views heard (I10).

- *Partnerships*

Reform documents (e.g. CGIAR Change Steering Team, 2008a) called for CGIAR to develop partnerships with new actors in IAR but also stressed the importance of building effective relations with NARS. Some donors considered that CGIAR was the only organisation able to work with and build capacity of NARS, but at the same time they saw it as doing the job inadequately (I6, I9). Other stakeholders considered that the CRPs created incentives for competition for funding between NARS and Centres (I10).

Although developing partnerships was a central element of the reform rhetoric, GFAR representatives reported difficulties in getting CGIAR to engage with diverse opinions (I10, I12). CGIAR documents revealed CGIAR's instrumental approach to engaging with GFAR, seeing it just as a vehicle through which CGIAR could identify new partnership opportunities, rather than a stakeholder that should be listened to (e.g. CGIAR Secretariat, 2009d). NGO actors considered CGIAR's work to be so remote from their priorities as to be almost irrelevant (I15/2). They argued that the opportunity to open CGIAR up to voices from farming communities had not been taken, but that CGIAR had gone in the opposite direction, engaging more closely with commercial actors in the agricultural supply sector (I15/1). Internal stakeholders also questioned the accountability of CGIAR to NGO partners when they had no voice in System structures (I2/1). External actors, such as farmers' groups, had previously been

able to engage in CGIAR policy development through membership of the GRPC, but this was abolished in the new system (CGIAR GRPC, 2010).

7.3.5. Conclusions about the impact and implications of the reform

The 2008-11 reform differed from previous reforms in both scale and impact. Where previous reforms had altered elements of the system, this process affected the whole system, changing management, accountability, governance and resource flows between Centres, and between individual Centres and the CGIAR system. It changed the make-up of the donor group and the relationships between donors and Centres. Long-term structural problems, including CGIAR's informal status and the tension between development and research priorities, were acknowledged and attempts made to address them. CGIAR's founding principles were redrawn and its mission explicitly reworked to focus on development outcomes, as articulated in the SLOs. It created structures enabling Centres to work in multi-partner programmes alongside a wide range of stakeholders. It reframed CGIAR's programmes to align with a research for development agenda and cast CGIAR as having a clear role within a wider AR4D community.

Attempts to address long-standing organisational problems were, however, only partially successful. The new structure changed the relationship between Centres and donors, and introduced the concept of Centres working together towards shared outcomes. However, Centres were unwilling to let go of their individual institutional identities, and donors were unwilling (or legally unable) to forego donor sovereignty. The focus on building partnerships placed contradictory pressures on Centres to provide support for weak NARS, work in partnership with stronger NARS and work directly with private actors.

Although CGIAR's new vision ostensibly signalled a changed focus of CGIAR's research onto 'people', and broadly defined development outcomes, the CGIAR Fund Governance Framework stated:

"The CGIAR's primary goal is to benefit all users of CGIAR research, including farmers and consumers." (CGIAR Fund Office, 2010b, p.1)

In this formulation, end-users of CGIAR's research were all-embracing, leaving space for CGIAR to provide research products to private sector actors or farmers in industrialised countries while still claiming to be aiming at its 'primary goal'. The focus on 'people' and on reducing poverty did not necessarily translate into a focus on poor farmers in LICs.

Similarly, although the SRF claimed a commitment to AR4D and a new approach to development outcomes enacted through the CRPs, in practice at least some elements of the CRPs were designed around existing core competencies and ongoing work was fitted into the

new programmes (CGIAR Consortium Office, 2011a). The rhetorical shift to an AR4D approach did not resolve the long-standing debate about CGIAR's position between research and development (I5, I9, I10).

The structural changes both opened up CGIAR to the possibility of new ways of working, and entrenched power dynamics, internal hierarchies and the primacy of its crop genetic improvement research. The change process was centrally shaped by System bodies, giving little voice to external stakeholders. The World Bank increased its control over CGIAR's decision-making structures and CGIAR's research agenda was shaped towards the World Bank's private-sector-led model of development. This market-led model, predicated on increasing smallholder participation in global agri-food markets, was also supported by other powerful donors including BMGF and USAID. As discussed in section 7.2.3.6, these actors held influential positions across multiple fora in the global agri-food system, forming a network of institutions that shaped the global agri-food regime. Through their control over policy making in CGIAR, they increased both their instrumental and discursive powers (see section 4.2.2.4) to shape research agendas to align with the dominant narrative of agricultural development.

7.4. GPG debate

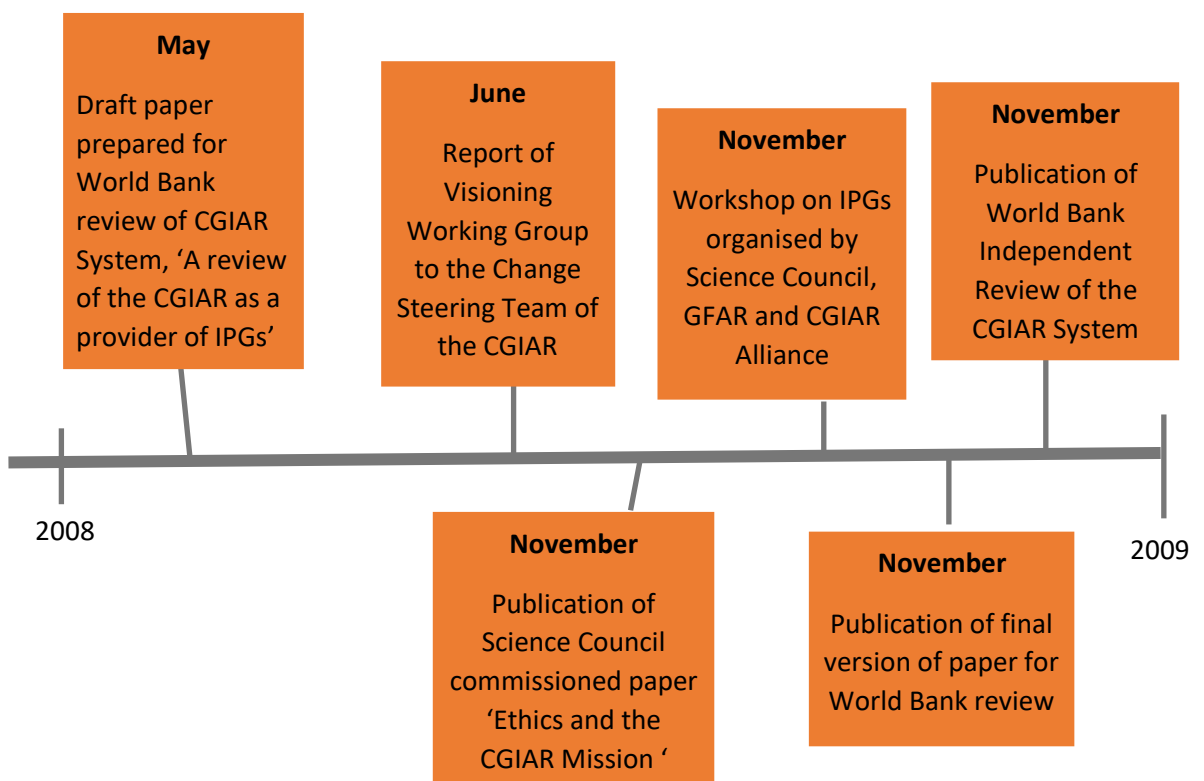
Discussions in 2006 on how to define I/GPGs, and what their provision meant for CGIAR's research agenda, had left many issues unresolved (see section 6.4.3). Those debates had placed GPG production in opposition to research focused on poverty reduction and questioned the impact on development outcomes of research conducted at a distance from local contexts. This issue was revisited during the 2008-11 debates about reorienting CGIAR's research towards measurable results and development impact. Prior to 2007, debates were couched in terms of CGIAR's mandate to produce GPGs. The same issues remained at the centre of debate about CGIAR's mission and purpose, but were intertwined with considerations of how to enact CGIAR's new commitment to 'research for development'.

CGIAR's GPG mandate was debated formally in workshops and papers throughout 2008, some of which are discussed below. This section sets out the range of positions taken by different actors in the debate; how those positions shaped decisions about CGIAR's role in a wider AR4D system; and how GPGs were treated by actors developing CGIAR's post-2009 structure. It shows how (and why) CGIAR moved away from GPGs as a central defining element of its work but continued to use the rhetoric of GPG production to describe its mission and purpose.

7.4.1. Locations of debate about CGIAR's GPG mandate

Debates in 2006 about CGIAR's GPG mandate had revealed continuing uncertainty over CGIAR's research priorities and specific role in IAR compared to other actors in the sector. These were questions that the 2008-11 reform process sought to resolve. GPGs were therefore discussed in several fora that informed decisions about CGIAR's proposed new structure and approach (see figure 7.7). Participants in all these processes were limited to internal CGIAR actors and a small number of linked organisations, such as GFAR.

Figure 7.7 Timeline of discussion on GPGs



7.4.2. Parameters of debate

In this period, the first discussion of CGIAR's GPG role was an internal paper (Sagasti and Timmer, 2008b) written to inform the Independent Review Panel. It aimed to help the panel answer two questions in its terms of reference: whether CGIAR had maintained a focus on providing GPGs, and whether CGIAR was "...efficient and suited to the development and dissemination of international public goods?" (ibid p.6)

Although debate in 2006 had questioned whether CGIAR should focus on providing GPGs, the External Review panel was not asked to examine that question, or explore CGIAR's understanding of its role as a provider of GPGs.

Sagasti and Timmer assessed CGIAR's system-wide priorities from an GPG perspective. They based their analysis on internal CGIAR discussions and papers, and on a conceptual framework developed by Sagasti and Bezanson (2001). This framework differentiated between the global benefits arising from the production of a good, and the actions needed – usually at a local or national level – to ensure its provision. It presented a model of an 'international public goods delivery system' (ibid p.ii) and described core and complementary components of such a system, which should be provided by international and local actors respectively.

Sagasti and Timmer (2008b) built on that framework to describe an GPG delivery system based on "...results-based management approaches..." promoted by the World Bank. Such approaches, they argued, focused "...attention on establishing clear goals and objectives, on measuring inputs and outputs, [and] on mapping and assessing direct and indirect outcomes..." (ibid p.17). This analysis of outcomes could be linked to the concepts of core and complementary components of an GPG delivery system, within which some elements would be within an organisation's control, while other aspects might be beyond their control but within their influence.

"For this reason, it is necessary to specify how far down the continuum from global and international to national and local to draw the line between what is an 'international public good' and the host of regional, national and local activities and policies that are necessary for it to materialize. There is also the need to specify the extent to which supranational entities are supposed to arrange for the provision of the global public good, and to what extent should they engage in regional, national or even local affairs to ensure this happens." (ibid)

This analysis encapsulated long-standing debates within CGIAR about its responsibilities for development outcomes of its research and its responsibilities towards other actors within the IAR field. In particular, it raised questions about how CGIAR should work with, and build the capacity of, NARS.

The authors argued that outcomes and impacts were beyond CGIAR's control. However, it should not just produce research outputs, but also consider how they would be delivered and used, and support other actors to provide the necessary extension, policy and training services.

The paper concluded that CGIAR had not maintained a focus on GPG production, or adequately considered their dissemination:

“While various documents and statements made by CGIAR authorities mention the provision of international public goods as a key rationale for its existence, it appears that there are no widely shared conceptions of what are the specific IPGs that the CGIAR should provide, how to organize the delivery systems for their provision, and how to evaluate the performance, accountability and responsibility of the various CGIAR centers in this regard.” (Sagasti and Timmer, 2008a, p.10).

The issue of GPG production was also examined by the Vision Working Group (WG), set up to review CGIAR’s vision and mission as part of the reform process. The WG presented CGIAR’s traditional perspective on GPGs, stressing the value of the international aspects of CGIAR’s research:

“Besides benefiting the poor in the developing world, research on many global issues, such as crop diseases, climate change, bioenergy policies, and agriculture and health problems, are highly relevant to industrial countries. Investing in such research is thus in their own interest as well as beneficial in the struggle against poverty in the developing world.” (CGIAR Change Steering Team, 2008b, p.10)

The Vision WG stated, without qualification, explanation or justification, that CGIAR produced “...scientific outputs that are international public goods.” It also stated that

“The CGIAR does not have primary responsibility for, or comparative advantage in, the actual delivery of development outcomes and impacts.” (ibid)

It did recognise that CGIAR needed to work with others to articulate ‘impact pathways’ by which research outputs would lead to relevant development outcomes. To do so, CGIAR needed to “...ensure its research strategies and priorities align with those of its R&D partners...” (ibid, p.17), increasingly commercial actors.

These statements articulated the Vision WG’s definition of CGIAR’s new role within an AR4D system, which required a new approach to GPG delivery working in partnership with other actors. However, key questions about how GPGs were defined, by whom, to whom they would be delivered, and who would consequently benefit, or which groups CGIAR might choose as research partners were not explored.

The Vision WG’s approach was challenged by the authors of a paper ‘Ethics and CGIAR Mission’ (Sandøe et al., 2008, p.85). They argued that, while CGIAR’s mission was for “*the world’s poor*” [italics in original], CGIAR should focus less on international aspects of its research and more on the mechanisms for making research outputs accessible to poor end-users. A focus on poor people also required consideration of issues of inequality and empowerment.

The paper echoed Sagasti and Timmer’s call for CGIAR to identify its position in relation to other providers of IAR, to ensure intended end-users received the inputs they needed. They argued that CGIAR should “...seek the most appropriate division of labor with other

organizations...” and CGIAR’s role should be to focus on longer term issues and those areas where other actors “...will not provide knowledge outcomes freely or cheaply.” (ibid)

In this context, the authors characterised CGIAR’s *raison d’être* as filling a gap not met by private actors or NARS. This was a restatement of one of CGIAR’s founding narratives, and a role that the authors characterised as a mandate to produce GPGs.

“However, the CGIAR has struggled hard to make this positioning more precise.” (ibid p.100).

The paper suggested this was because addressing complex factors creating poverty often entailed responding to local contexts and required activities beyond agricultural research. Attempts to tackle poverty had therefore led CGIAR programming towards development interventions.

The paper called for more transparency from decision-makers about the values underpinning processes to choose research priorities. The authors argued that the concept of GPGs had not helped CGIAR to identify its research priorities and its failure to use it for that purpose was “inconsistent with achieving the best impact on sustainable poverty reduction.” (ibid) They therefore considered it necessary to re-frame how GPGs were understood within CGIAR.

Participants in a workshop organised by SC and GFAR (CGIAR Science Council, 2008b) also agreed that CGIAR’s conceptualisation of GPGs should be re-examined.

Several speakers criticised CGIAR’s focus on GPG production rather than development outcomes, and characterised the focus as a means to absolve CGIAR of responsibility for the impact of its research. Speakers argued that the ‘international’ angle created a barrier to the production of research relevant to poor farmers, which was often context-specific. Some speakers saw the GPG focus as a means of passing responsibility for dissemination onto NARS, and called for a consideration of impact pathways from the production of research outputs to desired development outcomes. An SC member criticised the GPG approach creating “...unrealistic expectations of the division of labour between research and development.” (ibid p.4).

He called for CGIAR to shift its focus to achieving its mission to reduce poverty, rather than producing GPGs. Doing this would require CGIAR to act to ensure partners had the capacity to use research outputs. In this respect, he considered close relationships with NARS to be key.

Some speakers described a clear relationship between locally produced research and GPGs. They considered that local-level programme-implementation generated GPGs such as

knowledge about impact pathways, innovation systems and dissemination strategies. Such insights could derive from participatory research work with local stakeholders. An SC member defined GPGs in terms of goods needed by society that no other bodies would produce and highlighted their context-specific nature, arguing that

“...IPGs can be produced locally, provided that the explicit international research and impact domain is defined and the impact pathway to reach the domain is explicitly articulated.” (CGIAR Science Council, 2008b, p.1)

This new approach would require partnerships with other actors in AR4D, for which CGIAR would need “new concepts, “beyond IPGs.”” (ibid p.2). The debate about dissemination of research outputs was therefore linked to discussions on how to incentivise partnerships with new stakeholders in IAR, including private actors.

Participants who worked on NRM argued that GPGs were “...a conceptual barrier to research in complex situations.” (ibid p.3). One speaker argued that:

“Adhering to the IPG concept might be appropriate for the CGIAR when dealing with relatively simple and non-complex problems, e.g., crop germplasm improvement, but was less relevant for addressing technically and socially complex, multi-sectoral resource management-related challenges where there is less certainty with respect to outcomes...” (ibid p.4)

This understanding was echoed by the SGRP coordinator, who claimed that the genebank collections “...met the requirements for quintessential public goods...” (ibid p.2). CGIAR’s management of its PGR collections – and related issues of access to, and relevance of, its crop development research – therefore again escaped scrutiny. Only a representative from the Forum for Agricultural Research in Africa (FARA) raised questions of access and benefit-sharing.

There was agreement on the need to focus on intended end-users of research and to consider the tools needed to make products available to them. The workshop participants concluded that GPGs should be a tool with which to achieve CGIAR’s goal, rather than a goal in themselves. They also concluded that impact pathways and the capacity of partners were vital for delivering GPGs: “The challenge in reaching impact relates to what happens beyond the production of outputs...” (ibid p.6)

The Independent Review panel also considered the relationship between CGIAR’s research priorities and development outcomes. It stated:

“There has long been tension in the CGIAR between producing international public goods (through science) and delivering development impact.” (CGIAR Independent Review Panel, 2008, p.42)

The review recommended addressing this conflict through a ‘results-based management process’ through which CGIAR would be able to identify strategic partnerships:

“The CGIAR cannot function effectively as a component of an international public goods delivery system in the absence of robust partnerships that ensure production and scaled up application of public goods...The results, relationships, and requirements for strategic partnerships need to be made explicit and operationalized within a results-based performance framework.” (ibid p.13)

In that context, the review authors argued that CGIAR should develop “...solid linkages with national adaptive and delivery agents, principally NARS and nongovernmental organizations.” (ibid p.64). They also stressed CGIAR’s responsibilities for capacity building and institutional support, primarily to NARS.

The review therefore linked the development of partnerships for GPG delivery with the proposed ‘managing for results’ approach, and key elements of the suggested new structure. In this way, CGIAR’s GPG mandate was reconfigured and invoked to justify organisational reforms.

7.4.3. Outcomes of GPG debates

Across the fora, some areas of consensus emerged. There was agreement that previous interpretations of CGIAR’s GPG mandate had conflicted with a focus on development outcomes; that those interpretations had enabled CGIAR to absolve itself of responsibility for the impacts of its research; and that, as a result, CGIAR’s GPG mandate had to be reconsidered. The outcome was a reconfiguring of the GPG mandate to align with the impact agenda articulated in the 2005 Paris Declaration.

However, CGIAR was unwilling to relinquish what it (and many of its donors) considered to be its unique role as a producer of research that would not be produced at national level or by private actors i.e. its GPG focus. To square this circle, CGIAR had to explain how its work would lead to desired development outcomes and fill a gap not covered by other IAR actors. It did this by describing a system for delivering its research outputs to those who could benefit from them, building on ideas of an GPG delivery system outlined by Sagasti and Timmer (2008b). In such a system, CGIAR’s research products would be delivered through partnerships with others acting at different stages in the research to development continuum, such as NARS and commercial actors. CGIAR also acknowledged some responsibility for ensuring other parts of an GPG delivery system were in place, for instance by providing capacity building support to NARS. This new conceptualisation, of GPG delivery through partnerships, informed the design of the CRPs and the Strategy and Results Framework (SRF).

A further area of consensus was that CGIAR's PGR conservation and crop breeding work produced GPGs. Even stakeholders who considered the IPG concept to be "...a highly reductionist approach..." still thought it was relevant in "...traditional CGIAR work in areas like germplasm improvement..." (Kamanda and Bantilan, 2010, p.7). Issues of how genetic resources were used and shared were only briefly discussed in the Workshop on IPGs (CGIAR Science Council, 2008b), but otherwise escaped examination in the GPG debate. Instead, issues of access and use of PGR were debated in the context of developing new intellectual property (IP) principles (see section 7.5). This meant that questions about the relevance of crop breeding work to the production of GPGs were not addressed; and nor were questions of how PGR was managed, to whom it was relevant, and what benefits such research provided to different publics.

There was less agreement about what made goods 'public'. The Ethics paper (Sandøe et al., 2008) stressed the importance of access as a key factor making something a 'public' good, but the SRF focused on provision of goods as a key aspect of their public nature. This continued CGIAR's focus on the production and provision of goods, rather than moving the focus to the 'public' for whom the goods would be provided.

7.4.4. The GPG concept in the SRF

The SRF laid out how CGIAR would work with others to turn its research outputs into GPGs that contributed to development outcomes. It stated CGIAR's "...critical continuing role..." as a provider of GPGs, which it defined in terms of filling a gap not covered by national research bodies or private actors (CGIAR Consortium Office, 2011a, p.31).

"To effectively respond to the challenge of this unique role, the CGIAR is adopting a research for development perspective, as the organizing concept of its scientific effort." (ibid)

This marked a significant shift given that the research-for-development concept had been considered controversial only two years earlier (see Ryan, 2006).

The SRF authors moved beyond identifying CGIAR's GPG role in relation to other IAR actors, taking a formulation from the Independent Review to define IPGs as:

"...scientific and technological knowledge, agricultural research products and services, and research capacities to respond to and anticipate demand—that are essential to improve agricultural productivity and environmental sustainability in the poor regions of the world." (CGIAR Independent Review Panel, 2008, p.2)

This definition enabled a range of programme activities beyond research to be considered GPGs, including building institutional capacity and policy engagement – usually context-specific

activities. While the focus remained on agricultural productivity, and on goods rather than people, the loose terminology created space for CGIAR researchers to work in participatory ways with local communities to identify demand.

The SRF stated:

“The CGIAR’s enduring value as a catalyst, facilitator and leader of international public goods research in agriculture continues...” (CGIAR Consortium Office, 2011a, p.32)

but recognised that it needed partnerships with others to “...deliver outcomes effectively and efficiently...” (ibid). In this way, the SRF framed CGIAR’s GPG mandate as a core component of a system delivering development outcomes, rather than a barrier to their achievement.

Participants in earlier debates about GPGs (e.g. in 2000, see section 6.3.4) had blurred conceptualisations of GPGs as economic goods or as desirable societal outcomes; challenges to CGIAR’s focus on GPG production had centred on the conflict between these understandings.

The SRF presented a definition of GPGs that encompassed both conceptualisations by separating them out into distinct elements. It described an GPG delivery framework that targeted the production of economic goods to the delivery of development outcomes. This rhetorical sleight of hand enabled it to maintain its traditional approach to GPG production while apparently addressing donor concerns about the relevance and impact of its research.

Partnerships were central to this approach and to the design of the new CRPs. The GPG delivery framework explained how CGIAR would work with others to ensure impact from its research. However, the SRF made clear the limits of CGIAR’s responsibility for development outcomes. CGIAR researchers remained accountable only for producing research outputs (defined as IPGs) (see figure 7.8 below).

Level of activity	What may be achieved at that level	Role of CGIAR with appropriate partners
Development impact	Changes in well-being, improved livelihoods, availability of ecosystem services, opportunities, choices, reduced risks	
System Level Outcomes	Change in action/behavior of potential beneficiaries Change in productivity Change in equity/empowerment Change in market condition Change in investments Change in security of assets/habitats	CGIAR researchers are engaged with institutions which are scaling up research outcomes to contribute to System Level Outcomes
Research Outcomes	Recognition/appreciation of research knowledge Use of knowledge by partners Mobilization of new capacity and resources Extension of technology/materials Change in policy environment	CGIAR researchers are co-responsible with partners for generating Research Outcomes
Research Outputs	Change in knowledge Change in capacity Change in technology Change in materials Change in policy options Change in awareness/understanding	CGIAR researchers are accountable for generating Research Outputs

Figure 7.8 Table showing relationship between research outputs and development impact

Source: CGIAR Consortium Office (2011a, p.37)

The new approach to producing and delivering GPGs recognised differing impact pathways for different types of research (I13, I2/1, I8). This provided a space for NRM and other context-specific work that had previously been critiqued for being too development-oriented. It enabled some CRPs to focus on development outcomes at a programmatic level and challenge CGIAR's top-down research pipeline model. At the same time, it left commodity-focused research approaches intact.

Similarly, partnerships were understood in different ways across the CRPs. Some CRPs explored partnerships with communities to identify research needs. The majority focused on research partners with whom to develop products and delivery partners to get products out to end-users. The SRF highlighted the importance of NARS as partners but also stressed the role of private sector actors as delivery partners. It focused on the end goal of getting products to end-users through any appropriate channel, including through the use of exclusive licences

(I9). This inevitably led to a re-examination of CGIAR's IP principles as Centres required guidance on how to enter into agreements with private sector actors for the distribution of their own and others' research products.

7.4.5. Diverse perspectives

Despite the SRF's definition, stakeholders continued to understand CGIAR's GPG mandate in different ways. One donor recognised this ambiguity:

"...there are so many definitions, and people...use different definitions maybe to argue for their views." (I13)

The SRF presented GPGs as research outputs, valuable for their contribution to the production of societal benefits, but the impact pathways from one to the other were complex, uncertain and varied across research areas; and each CRP had to work out its own impact pathway.

Some questioned CGIAR's capacity to engage in the necessary research delivery systems, especially in contexts where traditional partners such as NARS were weak, and new partners were still to be identified (I18). Perhaps because of this, CRPs continued to focus on outputs not outcomes, based on a linear technology transfer model and there was only modest change to CGIAR's research work (I13).

Stakeholders continued to hold different views about how GPGs should be defined, and what their production meant for CGIAR's research agenda. Many took a market failure approach, considering that CGIAR should produce new crop varieties for groups not served by markets (I16, I9, I11, I14).

Others critiqued this approach for not addressing questions of who decides what research is needed and who benefits from research outputs (I12). Stakeholders also questioned CGIAR's ability to produce public goods when lines of accountability were to donors, not end-users (I10, I15/2) and CGIAR remained "...crop-focused rather than farmer-focused" (I10). Some argued that CGIAR failed to consider differential needs of 'publics' in different contexts (I17); did not ask questions about who farms, where and how and that its continued failure explicitly to consider farmers' lives left them implicitly excluded (I12). In this way, questions of who decides what societal 'goods' are required (first raised by NGO groups in the early 2000s) remained unexamined (I14).

7.4.6. Conclusions on GPG debate

Ryan (2006) argued that donor demands to demonstrate the impact of CGIAR's research disadvantaged GPG programmes (see section 6.4.3). However, from 2007 onwards, these

donor demands became the driving force of the reform process. The impact agenda forced CGIAR to address questions of the value of its research for reducing poverty, questions it had previously side-stepped. As a result, the GPG concept was reconfigured to align with the impact agenda.

The reconfiguration created space for Centres to build new partnerships with both development actors and private sector actors. This enabled some CRPs to engage more directly with communities than in the past. However, it also enabled Centres to argue for new IP guidelines to incentivise partnerships with private companies.

The SRF placed CGIAR's research outputs into an 'IPG delivery system' to reconcile the GPG mandate with 'managing for results' approaches. However, the framework still envisaged research being delivered through a top-down linear model, and decision-making structures about research priorities were not opened up to wider participation. It engaged with how products reached end-users, but not how end-users might contribute to shaping research priorities. The interpretation of CGIAR's GPG mandate incorporated into, and delivered through, the SRF therefore supported the continuity of long-standing research approaches.

CGIAR's GPG mandate retained a focus on what research CGIAR produced, rather than for whom it produced research, despite attempts by stakeholders (e.g. through GFAR) to reframe its mission in terms of the people it served (I10). CGIAR's claim to produce 'public goods' therefore remained questionable because without participation from those for whom the goods were produced, their relevance and value could not be gauged.

7.5. IPR debate

The development of policy on intellectual property (IP) was highly contentious and debated extensively during the 2008-11 reform process. The parameters and dynamics of the debate, and its outcome, are explained below. The process of developing new policies on IP saw a shift in approaches to GPG production, including an explicit recognition of the potential economic value of PGR held by CGIAR centres and a focus on providing incentives for partnerships with private actors. These shifts were justified by CGIAR's new commitment to working in partnership with other IAR actors to deliver 'impact', as outlined in the SRF.

7.5.1. Development of policy on IP and IA

CGIAR's management of its own, and others', IP had been the subject of internal deliberation since IP guidelines had last been agreed in 1996 (see section 6.2.4). These debates continued throughout the 2008-11 reform process. In March 2008, the Alliance presented a draft policy to GRPC. This draft declared CGIAR's IP policy to be "subservient" (CGIAR GRPC, 2008b, p.15) to its mission and its GPG mandate. It started from the presumption that Centres would usually "...make their assets globally, publicly available..." (ibid). It then laid out the "highly exceptional" circumstances (ibid) in which Centres could either take out exclusive rights or grant such rights to others. Limited exclusivity (e.g. time- or geographically-limited) could only be granted if necessary for the "...further development or transfer..." of research products (ibid). At the same time, all intellectual assets (IA – see box 7.3) had to "...remain openly available to public NARS in developing countries for further research, development and use..." (ibid). Centres could only use third party IP if the products arising from its use could be made publicly available. They were also not permitted to "...exploit their intellectual assets with the

sole intention to raise income." (ibid p.16)

Other terms remained similar to earlier drafts.

The March 2008 draft was revised in the light of comments received, and presented again to GRPC, in September 2008. In this iteration, policy was "driven by" (rather than "subservient to") CGIAR's mission (CGIAR GRPC, 2008a). Reference to CGIAR's GPG mandate was removed, allowing for the possibility that Centres might work to address CGIAR's mission without upholding the GPG mandate.

Box 7.3 Intellectual Assets and Intellectual Property

There is no fixed definition of the term 'intellectual assets' (OECD, 2008). It is generally used to refer to assets that cannot be valued but nonetheless add value to an organisation, such as reputation or staff skills. Intellectual property is the subset of IA that can be protected by law (Gibb & Bili, 2013). A CAS-IP staff member defined the terms in CGIAR's context:

"The term IA covers all intellectual assets (results, information, articles, publications, know-how, new plant varieties, etc.) whether or not they are protected by intellectual property rights (by which we mean copyrights, patents, trademarks, plant variety protection, etc.)." (Phillips, 2010)

The revised draft also allowed Centres to use third party IP even if access to the resulting products would be restricted if:

"the intellectual asset the Centre is producing will result in significant improvements to food security and or poverty alleviation in the countries where it can be [p.15] made available, and, b) no equivalent intellectual asset is available from other sources under no or less restrictive conditions." (ibid p.14-15)

However, no guidance was included as to what constituted 'significant improvements' or the tools a Centre might use to judge impacts *ex ante*.

The draft was further revised and presented to GRPC in March 2009. Again, the opportunities for Centres to take out IP were expanded from the previous draft, while protections for free access for NARS were reduced i.e. the draft allowed for the possibility that NARS might have to pay for access. The level of public information Centres had to provide about any restrictive agreements they entered into was also reduced, by the removal of the requirement to provide information about the terms of limited exclusivity agreements, the amount of income received and the source of any income received (CGIAR GRPC, 2009). Those changes responded to private sector concerns, especially about commercial confidentiality.

Through these changes, the draft policy shifted focus from ensuring CGIAR research continued to be provided as public goods towards focusing on when exemptions to principles of free availability of research products would be allowed.

In May 2010, GRPC held its last meeting and passed on the work of developing IA Principles to the Consortium Board (CB) and Consortium Office (CO). In November 2010, the CO briefed the Fund Council (FC) on IP issues (CGIAR Fund Office, 2010b). The CO argued that a new policy on managing IP/IA was needed to enable implementation of the CRP model.

A central element of the design of the CRPs was that Centres would work in partnership with a wide range of other IAR stakeholders. The CO argued that these new partnerships would require a changed approach to IP/IA management:

“The CRPs will cover the entire value chain spectrum from upstream research to on-the-ground delivery as described by impact pathways. Their breadth will usher in an unprecedented array of new institutional partnerships where close attention will be required for management of intellectual assets in order to reach the goals of delivery to the poor and of supporting sustainability through enterprise development.” (CGIAR Consortium Office, 2010)

This clearly placed the debate about IA management in the context of a market-led model of development, as promoted by WB and other major CGIAR donors.

The CO stated that “...the deliberate inclusion of the private sector in the CRPs...” made this issue all the more pressing. It acknowledged concerns that PS involvement might limit Centres’ ability to “...distribute products, goods, services and knowledge for the benefit of the poor...”, but stated:

“We believe that this can be managed through the development of sound IP practices/policy and management at the CRP level.” (ibid p.2)

The FC decided that the Consortium should develop new IA Principles, asking it to set up a working group on IP. This should work closely with an ad-hoc donor group consisting of representatives from major donors including BMGF, WB, USAID and Australia²⁶ – all representatives of countries or foundations generally in favour of expanding IP rights or with large corporate interests in industrial agriculture.

Once again, the draft Principles went through several iterations, going back and forth between the CB and the FC. However, other stakeholders, such as Centre Board members, did not have the opportunity to comment until the final draft had been agreed (I7).

Two documents, the draft IA Principles and a Briefing Paper on IP, which provided background on the development of the IA Principles, were submitted by the CO to the FC in March 2011 (CGIAR Consortium Office, 2011c).

FC members raised several concerns about the draft. These included that:

- Agreements between Centres and PS actors might “...impinge on the principle of global public goods.”
- Farmers’ Rights and TK were not adequately recognised
- Management of exclusivity agreements was unclear
- Mechanisms to hold Centres accountable for any decisions to “restrict global access.” (ibid p.20) were unclear
- The Principles were “...very broad, leaving room for flexibility and interpretation.” (ibid)

In response, the Consortium argued that the draft IA Principles “...contained basic aspirational guidelines in order to maintain flexibility of intellectual asset management from one situation to the next...” (ibid p.20) and that they were a “starting point.” (ibid) Further work would be needed to agree their “interpretation” and to develop implementation guidelines. The Consortium representatives also “...emphasized the need to avoid imposing constraints on the Centers that would weaken the impact of their work.” (ibid)

The Consortium asked FC members to “adopt a greater degree of flexibility...as otherwise a consensus may not be reached.” (ibid p.21)

²⁶ The full membership was Australia, BMGF, Canadian International Development Agency, European Initiative on Agricultural Research for Development, FAO, Japan, World Bank and USAID. (CGIAR Consortium Office, 2013a, p.8)

The meeting concluded that the Principles needed further revision before FC would adopt them; and that the Consortium would develop implementation guidelines.

The report of this meeting reveals that the Consortium wanted IA Principles to be as flexible as possible, but donors expressed “unanimous concern” (ibid p.19) about the levels of flexibility in the draft presented. A donor who was an FC member at the time confirmed that the process of negotiating the Principles was ‘very heated’ (I13), with Centres, particularly the commodity Centres, pushing for flexible Principles and donors ‘especially the European donors’ pushing for restrictive policies. A CAS-IP staff member similarly reported that negotiations were very difficult, with some donors needing convincing that Principles were needed at all (I16/1), and Centres holding a range of perspectives depending on their areas of work. Commodity Centres were particularly keen to be able to work with private sector actors, and saw ‘the results of their research as a tradeable asset...’ (I16/1) to use in negotiations with potential partners.

The CB approved the draft Principles in May 2011 (CGIAR Consortium Board, 2015). However, some CB members expressed concern about approving a document that donors had not yet agreed. They were also worried that external stakeholders would be critical of the new Principles, given that some NGOs were already concerned about CGIAR’s management of IP and the PGR they held ‘in-trust’, and its provision of exclusive licences to commercial actors.

For example, the ETC Group had challenged ICARDA about an exclusivity agreement it had made in 2009 on the transfer of barley varieties to a Mexican beer company (ETC Group, 2012). This agreement prohibited ICARDA from sharing the relevant varieties with other parties in Mexico. The ETC Group questioned whether this agreement violated the terms of the Seed Treaty, including its access and benefit-sharing provisions.

More fundamentally, the agreement raised questions about whether ICARDA’s research, effectively conducted on behalf of the brewing industry, in any way addressed the interests of poor farmers in Mexico.

ETC Group concluded that CGIAR’s approach to IA management was ambiguous and opaque.

“These ambiguities are enabling exclusive monopoly rights on, and restrictions on access to, public sector germplasm. Is it the role of any public plant breeding institute to grant the right to seek exclusive monopoly on varieties that are developed from plant germplasm held in trust for the world community? ... CGIAR is in danger of abandoning its uniquely public role. How can donors continue to support IARCs that are engaging in non-transparent private sector deals while claiming to help the world’s poor and hungry?” (ibid p.25)

The FC discussed a revised version of the IA Principles in March 2012 (CGIAR Fund Office, 2012a). The CO presented the document as the culmination of many months of negotiation

between the CO and the ad-hoc donor group, giving FC members little room to disagree. The Principles were presented alongside the Briefing Paper on IP (CGIAR Consortium Office, 2011b) and a further document outlining examples of when access to research outputs might be restricted.

The Briefing Paper laid out the rationale for changing CGIAR's approach to IA management, in light of the new organisational structure, the new emphasis on impact and the decision to develop partnerships with private sector actors.

The CO stressed:

“These CRPs...will require clearly established legal foundations to ensure equity among all partners.” (ibid p.3)

While acknowledging that there were different perspectives on the value of IPs, the paper stated:

“At the very least, the process for awarding IP rights is a way to provide business with a means for licensing intellectual assets. This has resulted in unprecedented progress in productivity and profitability of intensive agricultural systems across the world.” (ibid p.8)

The authors did not question whether the ‘profitability of intensive agricultural systems’ contributed to reducing poverty or hunger. Nor did they discuss extensive agricultural systems, farmer innovation systems, or other forms of innovation and knowledge, which may not be supported by formal IP arrangements.

The authors recognised that:

“IP rights are a tool that could have both negative and positive consequences for equitable benefit sharing effects.” (ibid p.13)

They also recognised different perspectives on the appropriate role for publicly funded bodies:

“Important strategic decisions must be made regarding the relative balance to be reached in the Consortium between proactively achieving targeted impact by harnessing the power of IP rights and interactions with the private sector, versus maintaining the founding value of free access to its research outputs and thereby allowing anyone to benefit from its efforts.” (ibid p.14)

This statement made clear the assumption underpinning the approach: that ‘impact’ could only be achieved by working with private sector actors. The approach did not take account of alternative views of how to achieve impact, such as those expressed during debates on GPGs in 2000 (see section 6.3.4).

Despite recognising this need for balance, the authors made explicit that the new approaches required a reframing of CGIAR's IPG mandate:

“...it is an inevitable compromise of the reform process that the traditional notion of the CGIAR as an exclusively IPG organization will need to evolve somewhat to enable the Centers to respond to donors’ wishes for greater accountability for impact on the poor whilst working in an arena of increasing IP protection.” (ibid p.15)

This made explicit the shift from a focus on IPG production to a focus on ‘impact’ regardless of the means to achieve it. For instance, one donor who was in favour of expanding opportunities for Centres to use IP restrictions stated that such an approach was “...super practical – we don’t care how it gets to the farmer as long as it gets to the farmer...” (I9).

The new IA Principles stated: “The CGIAR regards the results of its research and development activities as international public goods” (CGIAR Consortium Office, 2012b, p.2). However, it did not define IPGs.

The document stated that ‘partnerships’ are vital but did not state with whom and under what conditions.

The Principles included an acknowledgement of CGIAR’s obligations under international agreements and its intention that the Principles would align with the Seed Treaty, the CBD, human rights principles and Farmers’ Rights. It also intended that CGIAR research products should be available globally:

“All Intellectual Assets produced or acquired by the Consortium and/or the Centers shall be managed in ways that maximize their global accessibility and/or ensure that they lead to the broadest possible impact on target beneficiaries in furtherance of the CGIAR Vision.” (ibid p.3)

The ‘and/or’ allowed for accessibility to be restricted if it was considered necessary to ensure impact. However, ‘impact’ was not defined, and nor were CGIAR’s ‘target beneficiaries’. Additionally, no guidance was included regarding how Centres might judge if restrictions were necessary to ensure ‘the broadest possible impact’.

The Principles provided Centres with more opportunities to use IP than previously allowed:

- opportunities for Centres to take out IP, or allow third parties to take out IP, on their research products were expanded
 - Restrictions to accessibility were allowed if exclusivity agreements would enable a product to be developed, or enable the product to reach more farmers than would otherwise be possible. In all cases, products must still be available for public research or in case of emergency needs. However, Centres could ask the Consortium to waive these requirements if they could demonstrate that doing so would not “...jeopardize the furtherance of the CGIAR Vision.” (ibid p.5)

- opportunities for Centres to charge for providing access to their IA were expanded, and requirements to report on the funds received were reduced
 - Centres could charge fees “...on the condition that [this] does not divert them from the fulfilment of the CGIAR Vision.”
 - no fee waiver for NARS was required
- transparency about exclusivity agreements was reduced:
 - Centres could decide about exclusivity agreements and report to FC afterwards
 - Information to be made public was “...subject to confidentiality obligations...”
 - Full details of exclusivity agreements were to be disclosed to the FC IP group only.
 - A summary of agreements would be made available to the wider FC and to the public:

“The CGIAR is committed to the dual and equally important principles of (i) recognizing the legitimate interests of the private sector and other partners to maintain and protect confidential information and (ii) observing the need for transparency and accountability with respect to the use of public sector funds and activities financed in connection therewith.” (ibid p.9)

That these two principles were given equal weight in a public research body committed to the production of public goods marked a profound shift in CGIAR’s understanding of its mandate. IA management approaches now focused on the circumstances in which access could be restricted, rather than mechanisms to keep research outputs as available as possible. The focus shifted from a presumption of working with public sector actors to one of providing incentives for private sector partners, with whom it was necessary to work to achieve ‘impact’. Several FC members formally expressed their reservations about the Principles, though none blocked the FC from adopting them.

- FAO expressed concern about the authority of the Consortium to unilaterally approve deviations from the Principles without any oversight by the FC (CGIAR Fund Office, 2012a, p.34). FAO’s representative was also concerned about transparency, particularly the limited reporting of exclusivity agreements:

“Chair, the IA Principles, if adopted as proposed, could seriously damage the reputation of the CGIAR as an open and transparent public sector research network whose mandate is the creation of international public goods, rather than the generation of secrets and confidential information.” (ibid)
- CIDA expressed concern about financial liability of donors for any costs related to legal action.

- Several European donors were concerned that commitments to fundamental human rights were weakened.
- GFAR reiterated FAO concerns about the transparency of the reporting process; and raised concerns that Farmers' Rights were inadequately protected (ibid p.13).
- There was also concern that the principles were being approved without any detail on how they would be implemented.

The FC adopted the principles, with the conditions that they would be reviewed after two years²⁷; and that implementation guidelines would be developed.

7.5.1.1. Controversy continued

The IA Principles represented a compromise between profoundly different world views about CGIAR's mandate as a publicly-funded body. After they were agreed, these different perspectives remained.

Some stakeholders considered that the IA Principles did not adequately protect against private appropriation of publicly owned PGR, and instead enabled privatisation of resources CGIAR held 'in trust' (I4). On this view, the Principles epitomised a shift towards privatisation created by the reform process (I7).

Others thought that the IA Principles guarded against private control of publicly produced PGR (I11). Still others believed they struck an appropriate balance, recognising GPG principles while allowing for limited exclusions from them (I6, I9, I14). A further view was that the Principles enabled CGIAR to adhere to legal and contractual requirements required as CRPs developed (I16/1, I9). Donors from private foundations (I9, I14) considered the Principles were vital to bringing private sector investment into CGIAR, which was assumed to be necessary to get products to farmers. Whether stakeholders considered the IA Principles provided adequate protection against private appropriation of public goods remained a matter of "people's core values" (I14).

The Principles did not resolve dilemmas about the public nature of the goods CGIAR produced. In a context where public bodies might not have the capacity to deliver products to farmers, CGIAR needed to be able to work with private actors. The possibility of making money by distributing research outputs might make private actors willing to partner with CGIAR, but challenged understandings of GPG provision:

²⁷ The Principles were reviewed after two years, but have not been revised since 2012 (CGIAR-IEA, 2017)

“What is the international public good if the private sector is going away with a lot of profit? Or is that good because many farmers are benefitting? ...you just have to close your eyes to the private sector making a big profit...” (I13).

Alternatively, if CGIAR were allowed to commercialise its research products itself, it could use the funds raised to conduct more research and therefore develop more GPGs. However, such an approach blurred the boundaries between CGIAR and private research bodies. Nonetheless, the IA Principles opened the door to Centres being able to commercialise their own products and receive funding from private sources, something that donors from private foundations supported (I9, I14).

Those in favour of working with private sector actors defined GPGs in terms of their wide availability to farmers, and did not consider the means of their dissemination affected their GPG nature. However, such an approach does not ask whether all farmers can access the products equally, and does not consider economic, social or political barriers that might limit access for some groups.

FAO expressed concern that any organisations partnering with CGIAR in a CRP would have to adhere to the Principles, thus spreading CGIAR’s approach to IA management broadly across the IAR sector (FAO, 2012).

GFAR’s concerns focused on the limited attention paid to Farmers’ Rights in the Principles, and conducted a consultation on FR at GCARD 2012 (Chaves Posada, 2013). Some recommendations from this consultation were incorporated into the IA Implementation Guidelines, providing guidance to Centres on how to uphold FR in the context of managing IA.

Although the ‘Principles’ were adopted, some stakeholders remained concerned about Centres entering into exclusivity agreements without having to seek agreement from FC first. FC only had oversight of exceptions to the Principles after the event (I16/2). In addition, it remained unclear how a Centre (or the FC IP Committee) was to judge the validity of the reasons for an exception in the absence of a counterfactual i.e. whether an exclusivity agreement would ensure the greatest possible benefit to CGIAR’s end-users (I7).

7.5.2. Policy on information and data: Information and Communication Technology – Knowledge Management (ICT-KM) Programme

Alongside these debates about IP, CGIAR’s enactment of its GPG mandate was debated in relation to data and knowledge management. The ICT-KM programme, established in 2004, initially focused on improving access to CGIAR research and knowledge, internally and externally (see section 6.4.4.2). However, a 2007 consultation with external stakeholders

highlighted continuing difficulties in accessing CGIAR's research outputs. The consultation also raised questions about how knowledge was produced in CGIAR, asking whose knowledge was valued and how relevant research outputs were to end-users. These concerns all challenged CGIAR's claim to produce GPGs, and mirrored donor concerns about the development impact of CGIAR's research. In response, the ICT-KM programme developed the 'Triple A Framework' (i.e. Availability, Accessibility and Applicability) to help CGIAR scientists consider how to turn their research outputs into GPGs (Ballantyne, 2008).

Building on insights from the consultation, the ICT-KM programme examined "...how the information and knowledge needs of the CGIAR's priority stakeholders can be better met." (ibid p.1). It found that "...much CGIAR knowledge remains hard to see and hard to get." (ibid). It reported a wide variety of approaches to knowledge sharing across Centres, finding:

"...CGIAR...systems designed around relatively traditional forms of science publishing and communication (with pockets of innovation)." (ibid p.8)

However, in the context of the reform, which called on Centres to work alongside partners, including some "...not traditionally considered part of the agricultural knowledge system..." (ibid p.2), new approaches to knowledge sharing were needed to ensure CGIAR research was "...easily accessible to 'intermediary' actors who will adapt, improve and apply CGIAR knowledge." (ibid) The proposed Triple A framework aimed to provide guidance to scientists on making their research more easily accessible.

Ballantyne considered that CGIAR had not paid enough attention to concepts of public-ness when claiming to produce IPGs. He argued that the public-ness of research outputs depends on choices made by the holders of the research. For instance, research might incorporate proprietary technology that cannot be widely shared; it might be published in a subscription-only journal; or it might be available in only one language. Researchers therefore had to choose to overcome such barriers to public-ness.

Ballantyne described the conditions that made research products IPGs. These included ensuring knowledge was "...appropriable, accessible, sharable, reusable, available, affordable..." and "...applicable without restrictions." (ibid p.4) Ballantyne did not discuss whether elements of this definition were in conflict with the requirements of a new IP policy, which might seek to restrict appropriability.

The Triple A framework laid out actions needed to turn research outputs into IPGs, and suggested approaches researchers might take to make their research public. In presenting the framework, Ballantyne also advocated for Centres to develop System-wide approaches to

information management, including the creation of a core repository of all CGIAR research and coherence in licencing arrangements used across Centres.

Pressure to improve access to CGIAR knowledge continued throughout the reform. In 2010, a group of Open Access (OA) experts wrote to the Consortium and Fund Council Chairs calling for all Centres to adopt an Open Access mandate (Arunachalam et al., 2010) i.e. requiring researchers to publish in open access journals. The head of ICT-KM responded by highlighting progress made by Centres toward developing OA policies (Porcari, 2010). Noting the suggestion in the Independent Review that “...Centers should be encouraged to “make their research available and useful for development” – as well as for international science...”, she argued for moving beyond ensuring CGIAR research was published in OA journals to considering how to improve access to all CGIAR knowledge products.

In July 2010, CAS-IP and Bioversity organised a workshop (CAS-IP and Bioversity International, 2010) to discuss OA and wider knowledge-sharing issues. Participants identified different understandings of knowledge-sharing across CGIAR scientists: some measured the impact of their research by numbers of publications in peer-reviewed journals; others understood impact in terms of how insights from their research was used. Participants recognised that moving to focus on end-users of research would require new approaches to knowledge production, involving end-users in research design at an early stage. This in turn would require a culture change within CGIAR and different incentives to encourage scientists to see the benefits of sharing their research widely. Participants called for active support from CGIAR leaders to support a culture shift, and a coordinated approach across all Centres. Participants considered that the design of the CRPs, and donors’ requirements for CGIAR to demonstrate impact on development outcomes, both presented an opportunity for such a culture change (CAS-IP and Bioversity International, 2010).

Following those internal and external debates, an ‘Open Access and Data Management Policy’ was approved in October 2013 (CGIAR Consortium Office, 2013c). However, many CGIAR scientists retained a focus on academic outputs rather than participatory approaches to research (I8) and development impact (I5).

The ICT-KM programme worked to ensure CGIAR managed its information and data in ways which upheld its public goods mandate. However, this had to be accommodated alongside the new IP policy. The programme focused on making information held by CGIAR as widely available as possible, including information on genetic resources. It did not engage with wider

questions about PGR-related information, such as what information CGIAR had the right to make available, to whom and in what form (see section 7.6.3).

7.5.3. Conclusions on IPR debate

Under the new structure created in the reform process, Centres were expected to work in partnership with both public and private actors to deliver research outputs to potential end-users. The structure of CRPs arose from an understanding that Centres rarely had the capacity or skills to turn their research into accessible end products themselves and needed to work with organisations that engaged directly with farmers either through market mechanisms or through development interventions.

The new IA Principles made it easier for Centres to work with private sector actors by removing some perceived barriers to sharing IP and maintaining commercial confidentiality. Proponents of the new Principles saw this as a necessary step to creating the 'IPG delivery framework' envisaged in the SRF. Paradoxically, the creation of an IPG delivery framework required a reconceptualisation of CGIAR's GPG mandate to allow for restrictions on access to its research products, as permitted under the new IA Principles.

This was particularly relevant in relation to PGR, as Centres could choose whether their PGR under development was shared using an SMTA, or under more restrictive conditions. The latter would effectively remove products deriving from that PGR from the MLS (see box 7.1).

As with all other elements of the 2008-11 reform process, the IA Principles were shaped extensively by powerful CGIAR actors, notably WB, BMGF and USAID. These actors ensured the IA Principles enabled Centres to operate in ways which aligned with their preferred market-led model of development.

7.6. Programmatic approaches to IPR and GPGs and their impact on PGR management

During the 2008-11 reform, new structures were put in place to manage PGR, changing relationships between key players in the global PGR conservation system. The Crop Trust (see section 7.2.2) gained a central role, and new programmatic approaches to CGIAR's PGR management were developed. These changes took place in the context of a reframing of CGIAR's GPG mandate, and new IA guidelines, but they built on long-standing understandings of the use-value of CGIAR's genebank collections.

7.6.1. GPG2

The ‘Global Public Goods Rehabilitation Project’ Phase 1 (GPG1) ran from 2003 to 2006 (see section 6.4.4.1). It focused on improving standards and systems of conservation in CGIAR’s genebanks. GPG2 (Collective Action for the Rehabilitation of Global Public Goods in the CGIAR Genetic Resources System, Phase 2) ran from 2007 to 2010, and was again funded by the World Bank²⁸. Its purpose was to ensure the sustainability of GPG1 results, and to build collective action across CGIAR Centres (CGIAR SGRP, 2010) to improve genebank management standards, share knowledge, improve information about the contents of the genebanks and increase CGIAR genebanks’ involvement in wider biodiversity conservation efforts, including of crop wild relatives (CWR) (CGIAR SGRP, 2008). It also sought to build mechanisms to place CGIAR’s genebank-based conservation work at the centre of a global system of PGR management as envisaged by FAO (FAO CGRFA, 2010). GPG1 and GPG2 both operated on the basis that PGR were intrinsically public goods necessary for CGIAR’s own plant breeding work, and that of the wider agricultural community.

Work under GPG2 expanded the remit of CGIAR’s genebanks beyond the 64 crops included in Annex 1 of the Seed Treaty. One workstream included making inventories of genetic resources in Centre genebanks beyond those of the ‘mandate’ crops. These included

“...underutilized species, specialized collections, DNA and other genetic materials, plant pest and disease organisms, and other elements of associated diversity.” (SGRP Secretariat, 2008, p.13)

Work to map these collections was undertaken by Bioversity International in collaboration with the Generation Challenge Programme and CAS-IP. This suggests that interest in mapping these collections aligned with those programmes’ private-sector oriented approaches to PGR use (see section 6.4.4.3). While underlying interests informing decisions to expand the collections cannot be ascertained, available documents show that this workstream did not include any consideration of Farmers’ Rights or access and benefit sharing (ABS) issues associated with extending the range and type of genetic resources held in genebanks.

A further area of work under GPG2 was the development of a ‘sustainability plan’ to ensure the continued maintenance of the genebanks. GPG1 and GPG2 were funded by the World Bank as time-limited projects, with the expectation that Centres would be able to find on-going funding to maintain the genebanks in their improved state. But GPG2 funding ended in 2010, as new funding mechanisms were being developed under the 2008-11 reform process.

²⁸ CGIAR’s public archive contains only the GPG2 mid-term review and final report. Additional (but not complete) documentation was obtained through a Freedom of Information request to the World Bank.

Stakeholders in GPG2 (the CGIAR System, Centres, World Bank and Crop Trust) therefore drafted a ‘sustainability plan’ to address the issue of how the genebanks would be funded in the new System. As part of this process, a methodology for costing genebank operations was developed (CGIAR SGRP, 2010).

The first draft of the sustainability plan was written in July 2008 (SGRP, 2008)²⁹. The plan was extensively debated and redrafted, with the Crop Trust in particular raising many concerns (ibid p.81). Later versions of the plan are not available publicly.

The July 2008 draft of the plan was presented in the form of a vision of how the genebanks would operate in 2020. The authors envisioned many more crops being included in Annex 1 of the Seed Treaty, and CGIAR having a central role in a global system for germplasm storage, distribution and documentation; as well as service provision to other genebanks. Other partners in the proposed global system would take responsibility for areas of work such as *in situ* conservation and participatory breeding.

The vision authors saw CGIAR expanding its “...custodianship operations to cover for underutilised and non-crop germplasm...” (ibid p.3), which they considered had to be collected from farmers’ fields before it was lost. Under the terms of Centres’ agreements with FAO, CGIAR held PGR ‘in trust’ as global public goods; the responsibilities associated with ‘custodianship’ of crops not covered by the Seed Treaty were not defined. The sustainability plan did not discuss issues of Farmers’ Rights or ABS in relation to any non-Annex 1 crops that might fall under CGIAR’s ‘custodianship’. This approach side-stepped highly political debates about ownership of, and control over, PGR not covered by the Seed Treaty.

The 2008 version of the sustainability plan was submitted to a mid-term review of GPG2, which called for a clearer focus on CGIAR’s role in a global PGR conservation system alongside other actors, particularly NARS (CGIAR SGRP, 2008). It also called for consideration of

“...the possibility to re-introduce the genetic resources into the local/rural communities if traditional farmers need or request them.” (ibid p.4)

This concern was not presented as an obligation to farmers, and was not reflected in GPG2’s final report, or in the Genebank CRP that grew out of the sustainability plan (see section 7.6.2).

The details of the sustainability plan were negotiated (with no transparency) between the major stakeholders in GPG2. By the time GPG2 ended in June 2010, it had not been agreed. However, debate about the sustainability plan underpinned ongoing consultations about the future shape of PGR management; and the costing exercise informed decisions about future

²⁹ This first draft was obtained through a Freedom of Information request to the World Bank.

genebank funding. In this way, the World Bank and the Crop Trust were highly influential in shaping PGR management priorities in CGIAR under the new organisational structure.

Under the GPG2 programme, the scope of CGIAR's PGR work was extended. Its approach prioritised *ex situ* conservation over other approaches to biodiversity conservation, and reinforced framings of the purpose of conservation in terms of the potential value of conserved PGR for crop development. It privileged an understanding of the value of PGR in terms of the genetic information that could be extracted from it. In this framing, the value of PGR derived from its use, and to use it, information about its characteristics had to be readily available. An important part of GPG2's work was therefore the establishment of information systems linking PGR conservation and use to the extraction of genetic information. This information was made available through databases and other online mechanisms, providing information in a format that was easily accessible to researchers.

GPG2 continued the move towards privileging an understanding of the value of PGR as raw material for scientific research; and as information technology and biotechnology developed, the value was increasingly held in terms of individual genetic sequences and traits that could be extracted from the seed. GPG2 documents did not engage with issues of Farmers' Rights, Traditional Knowledge associated with PGR or ABS issues, or explore understandings of 'global', 'public' or 'goods'.

7.6.2. The Genebank CRP

CGIAR's new organisational structure came into being in early 2010 and all system-wide structures, including SGRP and GRPC, were disbanded at the end of 2010 (FAO, 2011). However, new structures had not been agreed. To ensure continued funding for the genebanks, the Consortium Office proposed a new CRP, presenting it to the Fund Council in April 2011 (CGIAR Fund Office, 2011a). This proposal was based on the costing study conducted in conjunction with the Crop Trust, under GPG2.

The proposal raised concerns about how the genebanks would be funded under the new system. Previously, Centres had covered genebank costs from their general funds, but this funding source would no longer be available when all funding was channelled to specific research priorities through the CRPs. This research-focused model did not provide a mechanism for funding genebanks, as they did not produce research outputs themselves, but rather provided resources used by other research programmes. The proposal argued:

"This is somewhat of a paradox, because the genebanks are in some respects the "jewels in the crown" of the CGIAR, and the task of maintaining and making these

resources available is absolutely a core activity, without which the centers could not fulfill their international responsibilities.” (CGIAR Consortium Office, 2011e, p.3)

The proposal’s authors called for the creation of a funding stream for the genebanks, in the same format as the CRPs. The funds would be used for ongoing conservation and distribution costs and further work upgrading and expanding the collections. The lead management role for the genebank CRP was taken by the Crop Trust, which had been providing grants to CGIAR (and other) genebanks, since 2007.

The Fund Council approved funding for one year (CGIAR Fund Office, 2011a).

Alongside these funding discussions, the Consortium Office conducted a scoping study to examine how genetic resources issues were covered across the CRPs (CGIAR Consortium Office, 2011d). The purpose of the study was to identify gaps or duplications of genetic resources work across the research portfolio, and to examine how cross-cutting issues, such as policy development, were managed.

The scoping study highlighted the dual role of the PGR collections in CGIAR:

“They are the targets of research, particularly to create improved varieties and breeds, but the CGIAR also performs the service of conservation and distribution of these resources.” (ibid p.i)

It reported that these two roles were inadequately recognised across the CRPs or in the SRF. The study found that CRPs addressed PGR issues in different ways and “...often do not explicitly acknowledge the sources of genetic resources to be used in the proposed research.” (ibid p.ii) Some CRPs, such as the CRP on roots, tubers and bananas, included all aspects of a “...genetic resources conservation and use system...” (ibid p.14) while others e.g. the wheat CRP, considered only use, not conservation. The study authors considered that none of the CRPs had taken into account the conservation of new genetic resources their research would produce. Additionally, they had not adequately considered the IP implications related to their research results or the implications of different legal frameworks for biotechnology in different countries. The study argued that issues such as these should be managed through a systemwide approach “...rather than the apparently uncoordinated approach of the disparate CRPs in various stages of review and implementation.” (ibid)

The study also considered how policy research and information management would be dealt with across the CRPs. It highlighted CGIAR’s dual role in relation to policy formation, as it was both a resource for international policy development and an actor affected by new policies and frameworks. Because of this, CGIAR should have the means to both follow policy developments and engage with them, but there was no central location for this work in the

new structure. The study recommended setting up a “...formal advisory mechanism, such as the former GRPC...” (ibid p.iv) to agree System-wide responses to international policy processes. It also recommended establishing mechanisms to support Centres in complying with existing and new regulations.

On information management, the study called on CGIAR to continue the work of creating a “...community of collaborating genebanks...” (ibid p.26) that had begun under GPG2 and the Generation CP.

On a separate issue, the study recommended CGIAR develop a plan for capacity building for PGR management, “...including agrobiodiversity in agroecosystems.” (ibid p.v)

Building on the one year funding proposal and the scoping study, the Crop Trust developed a five-year Genebank CRP proposal (GCDT, 2012b), which was presented to the Fund Council in April 2012.

The proposal stated PGR conservation was “...an absolutely indispensable prerequisite...” (ibid p.2) for achieving the System Level Outcomes of poverty reduction and food security. The authors claimed that the work covered in the proposal underpinned the work of many other CRPs.

The proposal highlighted CGIAR’s service role in providing long-term germplasm storage, distribution and information systems to a wide range of partners including NARS and private actors. It also stressed the role of the breeding programmes as “...a major distribution mechanism, for the diversity conserved in the genebanks.” (ibid p.5). It stated:

“The breeding lines developed at the Centers offer a convenient and desirable package of genetic diversity prized by NARS and other plant breeders. In many cases this is the preferred mechanism for transfer of traits contained in the Center collections.” (ibid)

In this framing, first articulated in the 1970s, genetic diversity is preserved by extracting specific traits from some seeds and placing them in new varieties, to extend “...the genetic base of improved materials...” (ibid p.20). Breeding work and genetic conservation are closely linked, and crop improvement is a means of conserving biodiversity. The proposal’s authors did not consider the possibility of conserving genetic diversity in farmers’ fields. They stated that the genebank collections:

“...are simply the world’s most important biological resource for agriculture.” (ibid p.8)

In this framing, biodiversity is only of value to future agricultural development if it has been taken from farmers’ fields and placed in genebank collections in a form that enables its use in

lab-based crop research. Other possible approaches to agricultural adaptation are not considered.

Despite the recommendations of the scoping study, the Genebank CRP did not contain any reference to agrobiodiversity or *in situ* conservation. It referred to farmers only once, as the ultimate end beneficiaries of new crops, but did not differentiate between different types of farmers.

The proposed management structure for the Genebank CRP was:

“...a partnership between the CGIAR, the Centers and the Global Crop Diversity Trust.”
(ibid p.1)

The Crop Trust took the lead management role, and also continued its bilateral relationships with individual Centres in relation to their collections. The Trust board was to be accountable to the Consortium Board for the performance of the CRP. The Crop Trust also provided funding to the CRP. The Crop Trust therefore had a dual role, as both funder and manager of the CRP.

The proposal was approved by FC7 in April 2012. The Fund Council suggested including *in situ* conservation work into the proposal (a separate CRP proposal on *in situ* conservation had been rejected at the same meeting), but this was rejected because the Crop Trust mandate covers *ex situ* conservation only (CGIAR Fund Office, 2012a).

Attempts at finding a mechanism to support *in situ* conservation continued. In November 2012 (CGIAR Fund Office, 2012b), the Fund Council recognised that gender issues and agrobiodiversity were not covered adequately in the CRPs, and considered the need to ‘mainstream’ them as cross-cutting themes in all research areas (CGIAR Consortium Office, 2012c).

The Consortium held a workshop in July 2012 to develop its approach to *in situ* research. This was reported to GCARD in October 2012. The briefing to GCARD reported the high priority given to *ex situ* conservation in CGIAR, noting that

“*in situ* and on-farm aspects have generally received less attention, with as yet, no clear system-wide plan or strategy. An analysis of the current research portfolio showed that CRPs are highly uneven in their inclusion of agro-biodiversity conservation and use research...” (Atta-Krah, 2012)

The briefing reported that a system-level strategy was being developed to ‘mainstream’ agrobiodiversity, as well as gender; and that this strategy would be proposed at the next FC meeting. However, the minutes of that meeting only reported discussion of the gender mainstreaming strategy (CGIAR Fund Office, 2012b). An agro-biodiversity strategy was not presented.

7.6.3. PGR information and data management

An important element of the process of improving the management of genebanks was the improvement of information systems and data management about the contents of the genebanks. As discussed above (see section 7.5.2), debates about CGIAR's provision of GPGs encompassed issues about how data were gathered, stored, used and made available to others. GPG2 engaged with this debate by prioritising improving information about genebank accessions; and improving availability of that information, through publicly accessible databases and information platforms.

The Genebank CRP built on this understanding of the value of information. Its approach was based on the premise that extracting genetic information from seeds to place into new crops was a mechanism to conserve biodiversity. The seeds themselves, and information about their genetic traits were freely available, and considered to be GPGs. However, the information was shared in a form which was only accessible or relevant to crop breeders and researchers. While Centres could – and often did – share seeds with farmers, there was no obligation on them to do so. The approach linked the value (to researchers) of PGR to the information available about it, leading to a new focus on turning genetic resources into genetic sequence information.

The Crop Trust was a key player in shaping the genebanks' approach to information management. As discussed above (section 7.2.2) the Crop Trust initiated several projects that aimed to expand information about genebank accessions and make it available through databases and online portals. This approach was expanded further following a meeting in December 2012, at which an international group of scientists considered "...a "Big Vision Project" that would support genomics-based characterization of CWRs..." (McCouch, 2012). The meeting was reported in an article in *Nature*, which explained that the project sought to "mine biodiversity" to find traits that might be useful for future crop development. Suggested actions to do this included the creation of

"...an internationally accessible informatics infrastructure to catalogue the diversity in the world's seed collections. This would link seeds and genetic stocks directly to passport, genomic and phenotypic information." (McCouch et al., 2013)

This information would be stored and shared digitally. The *Nature* article criticised international regulatory frameworks, including the CBD, which the author claimed created barriers to researchers' access to PGR. The article did not engage with issues of Farmers' Rights, ABS, or consider indigenous knowledge underpinning locally-adapted crop varieties that the initiative sought to exploit.

The initiative developed into DivSeek, under the auspices of the Crop Trust, and including CGIAR Centres as members of the DivSeek ‘community’. DivSeek has been highly controversial, with NGOs and farmers’ organisations arguing that it undermines the principles of the Seed Treaty by enabling researchers to access genetic information without having to access physical seeds, thereby circumventing the MLS.

7.7. Conclusion

This chapter has examined CGIAR’s 2008-11 reform process and its impact on CGIAR’s IP management, PGR management and its GPG mandate. It has mapped how pre-existing debates on those issues were dealt with through the reform, leading to significant policy changes. It has shown that (and how) those issues were intertwined; and how the changes relating to each of them were managed concurrently but separately. It has examined how decisions about CGIAR’s direction of change reflected key donors’ agendas and dominant policy perspectives in the wider global agri-food system.

The 2008-11 reform process was driven by donor demands for CGIAR to demonstrate development impacts from its research. The reform created a new organisational structure for CGIAR, reconfiguring relations between donors and Centres, and increasing the influence of larger donors, particularly the World Bank. CGIAR’s GPG mandate was re-interpreted, and new IA Principles were developed. CGIAR’s research agenda was ostensibly targeted towards contributing to achieving key development outcomes; and its organisational structure redesigned to enable it to do this in conjunction with a wide array of partner organisations, including private sector (PS) actors.

Prior to the 2008-11 reform, different stakeholders in CGIAR interpreted its GPG mandate in a variety of ways. In earlier debates, narratives focusing on the outcomes of CGIAR’s research i.e. the social ‘good’ resulting from its work, were often in contention with narratives focusing on outputs i.e. the economic or knowledge goods it produced (see section 6.4.3). During the reform, the GPG mandate was reformulated, and a new narrative was presented in the SRF. Where earlier debates had framed producing GPGs as a barrier to prioritising poverty reduction, the SRF’s narrative framed CGIAR’s GPG mandate as a core component of a system delivering development outcomes. Diverse stakeholders with different perspectives were thus able to commit to either – or both – interpretations of its GPG mandate.

The interpretation of CGIAR’s GPG mandate laid out in the SRF took the provision of goods as a key aspect of their public nature. Other voices (e.g. Sandøe et al., 2008) stressed the importance of access as a key factor making something a ‘public’ good. Nonetheless, a generic

approach to the ‘public’ for whom the goods would be provided remained intact. The new conceptualisation of CGIAR’s role in the production and delivery of GPGs did not engage with questions of which GPGs should be produced, who would decide, or who might benefit from their provision. Instead, an understanding of GPGs as generic goods of general benefit to ‘people’ prevailed, thus failing to engage with issues of power between different actors in agri-food systems across scales.

In the process of redefining its GPG mandate, CGIAR’s work in crop breeding and PGR conservation escaped scrutiny. It was taken as ‘given’ that these areas of its work created GPGs, and the relationship of crop development and conservation to GPG production was not examined. The Genebank CRP placed genebanks at the centre of CGIAR’s GPG offering, but did not interrogate in what way they provided GPGs. Wider considerations of access and ownership of PGR, farmers’ rights and benefit-sharing were unexamined under the Genebank CRP.

The change in the framing of CGIAR’s role in producing and delivering GPGs, presented in the SRF, enabled a new approach to IP policy. In order to deliver GPGs to potential end-users of research, major donors and the commodity Centres argued that partnerships with private actors were necessary. The SRF stated:

“Although the production of public goods continues to be at the core of CGIAR’s business, the legal boundaries for access and exchange of germplasm, technologies and research tools have changed considerably over the past few decades”. (CGIAR Consortium Office, 2011a, p.79)

The reframing of CGIAR’s GPG mandate went alongside the development of new IA Principles, and was necessary to enable agreement on the new Principles. Instead of upholding a broad understanding of GPGs, and continuing to limit IP rights on CGIAR research outputs, the opposite approach was taken. The model of delivering results described in the SRF was predicated on building partnerships with private sector actors and would not have been possible without such a shift. Paradoxically, the GPG mandate was reframed to allow for a new articulation of CGIAR’s position and role in a GPG delivery system.

The new IA Principles extended opportunities for Centres to take out IP or sign exclusivity agreements on CGIAR’s research outputs. The IA Principles recognised the potential economic value of PGR held by, or developed by, the Centres, and allowed Centres to use that value in negotiations with private actors. The Principles also reduced oversight of such agreements, with Centres only having to report to donors after the event. They did not provide guidance to Centres on how they should judge whether such agreements would best serve the interests of

the intended end-users of CGIAR's research (or define who those end-users should be). Instead, the Principles were predicated on assumptions about the relationship between agricultural development and poverty reduction that aligned with perspectives favoured by key donors such as the World Bank, USAID and the BMGF. The new Principles enabled CGIAR to deliver its research products through market mechanisms, and act in line with dominant paradigms of market-led agricultural development.

As well as being affected by the changes in the IA Principles, and in the scope of CGIAR's GPG mandate, decisions on PGR management and exchange, were consolidated under the Genebank CRP. This focused on *ex situ* conservation, and gave oversight of the genebanks to the Crop Trust.

It entrenched long-standing approaches to PGR conservation, by focusing on the potential value of PGR for new crop development and making information about genetic traits publicly available – to researchers and breeders with the technical capacity to access it. It privileged an approach to biodiversity conservation based on replacing genetic diversity in the fields with 'improved' varieties, while claiming to preserve diversity by inserting it into new crops. It continued to privilege an approach to PGR management and conservation based on valuing PGR in terms of its use in future crop development; and privileged crop development based in laboratories rather than in farmers' fields.

The focus on *ex situ* PGR management reinforced the idea of the 'isolability' of seeds i.e. that they could be taken out of the ecosystem in which they originally grew, and their valuable traits could be isolated and inserted into other crops or grown in different locations. The expansion of information held by genebanks extended this approach further. Technological developments enabled genetic sequences to be isolated and stored as digital information that could be exchanged between researchers without physical seeds being transferred. This undermined the SMTA system and the protections against patenting it contained. Additionally, genebank work expanded beyond Annex 1 crops. CGIAR claimed a position for itself at the centre of a global conservation system, but extended its 'custodianship' to crops not bound by Seed Treaty rules, thus undermining agreements reached through international negotiation. In this way, CGIAR's programme work had the potential to undermine UN treaties, and strengthen corporate control over, and access to, PGR it held 'in trust' under those international agreements.

Additionally, the Crop Trust's management role in the CRP gave it a dual role in relation to the genebanks – as both manager and funder. The Crop Trust was run by a small group of national,

corporate and philanthropic donors, who also held positions of power across other parts of CGIAR. These included BMGF, Syngenta Foundation and USAID. These same actors participated in other initiatives that were influential in shaping the use and control of PGR and directions of change in the global agri-food system more broadly (see section 7.2.3.6).

The responses of national governments and corporate actors to the food price crisis also gave new impetus to CGIAR's traditional focus on crop breeding to increase agricultural production and productivity. CGIAR was able to frame its crop breeding work as essential for food security, repositioning itself as an indispensable part of global action to address the food price crisis.

Across the organisational, programmatic and policy changes, powerful actors within CGIAR were able to shape the reform outcomes to reflect, and enact, their interests. For instance, the ad-hoc donor group, which participated in developing the IA Principles, consisted of donors in favour of expanding market approaches to agricultural development (see section 7.5.1).

Stakeholders representing interests of wider stakeholder groups, such as GFAR, were excluded from decision-making processes.

Similarly, by unilaterally funding the GPG1 and GPG2 programmes, the WB was able to shape approaches to PGR management that informed the development of the Genebank CRP. In this way it used its instrumental power as a core donor to create institutional structures that supported its promotion of a private-sector-led model of development.

Through the reform, the World Bank increased its control over CGIAR's decision-making structures at several levels, and oversight by other bodies decreased. For instance, the disbanding of GRPC removed a mechanism for policy scrutiny beyond the Fund Council. Within CGIAR, changes across the GPG mandate, IA Principles and PGR management were mutually reinforcing, creating a new structure based on a 'results-oriented' business model, reflecting the preferred approach of key donors including the World Bank, BMGF and USAID.

The 2008-11 reform process took place at a time when donor countries were focusing their attention on the global agri-food system. The 2008 WDR and IAASTD reports had presented competing perspectives on how to address poverty and food insecurity, and the food price crisis intensified debate. These factors created an environment within which CGIAR was negotiating its new structure with donors who were also shaping the debate. In this context, CGIAR aligned its approach with those of its major donors, particularly the World Bank and the BMGF. CGIAR continued its traditional focus on seed breeding for crop productivity and embraced opportunities to work with PS actors to deliver its research through commercial channels. IAASTD's call to focus research on the needs of the poorest and most vulnerable was

not reflected in the SRF's generalised approach to poverty reduction. Instead, despite major organisational and rhetorical changes, CGIAR continued to take a top-down, productivist, science-led approach to addressing poverty and food insecurity.

Chapters Five, Six and Seven have described CGIAR's policy development on PGR and IP, and its approach to its GPG mandate, from 1990 to 2012. Chapter Eight brings together the findings from the preceding chapters and considers whether, and if so how, CGIAR's policy approaches on those issues have changed over the time period under consideration.

8. Discussion and conclusions

8.1. Introduction

The preceding chapters (Five, Six and Seven) have presented a history of CGIAR's policy-making on plant genetic resources (PGR) management and intellectual property (IP), and the intersection between those policies and CGIAR's changing perspectives on its mandate to provide global public goods (GPGs). In those chapters, different narratives visible within policy debates on PGR, IP and GPGs were identified and described, along with the actors associated with those narratives, and their roles in internal and external policy-making processes. The chapters have examined key moments when narratives clashed, and highlighted the policy outcomes from those contestations.

The empirical chapters have also described how decisions about policy directions have interacted with changing global frameworks for PGR use, exchange and control, as well as with changing priorities among donor groups and in the wider global agri-food system.

This final chapter brings together the findings from the three empirical chapters, to examine whether (and if so, how), CGIAR's policy positions on PGR management, IP and its GPG mandate have changed. It presents an overall picture of the directionality of CGIAR's research priorities and approaches, and the influences shaping that direction. It summarises the findings of the thesis regarding policy positions held by different actors, the interactions between those positions, which gained dominance, and how those positions reflect competing perspectives in and on the wider food system.

The chapter begins by summarising the findings from Chapters Five, Six and Seven. It then interrogates the findings against the conceptual framework presented in Chapter Four, and provides answers to the research questions. The chapter concludes by retrospectively evaluating the conceptual framework and methodological approach used for the research, identifying contributions and limitations of the research and policy implications arising from the findings.

8.2. Summary of findings

This thesis has examined CGIAR's mandate to provide public goods and to manage the PGR it holds in trust for the international community as GPGs. Its exploration of policy development regarding those issues has illuminated issues of power, politics and voice by describing how policy making was influenced by specific actors (particularly donors) and their agendas.

The conceptual framework described in Chapter Four supported an examination of key factors influencing policy processes in CGIAR i.e. the interaction between narratives, actors telling them, and their interests. It provided tools with which to examine the claims – made by different stakeholders in CGIAR, at different times – that CGIAR acts as a producer of GPGs. The framework enables a consideration of the interactions between diverse narratives about CGIAR's production of GPGs and the interests of actors proposing different interpretations of its GPG mandate, in the context of political economic factors shaping the global agri-food system. That conceptual framework was the lens through which the data presented in Chapters Five, Six and Seven have been examined. The current chapter focusses on key insights concerning the politics of contestation over which goods CGIAR has provided, to which publics, who has been involved in deciding which goods CGIAR should produce, who the goods benefit and how equitable are distribution and access mechanisms. It also considers how choices about GPGs relate to power dynamics within the global agri-food system.

Chapter Five presented CGIAR's origins in 1971 and its initial approach to crop development and PGR collection, conservation and use.

CGIAR was founded with a mission to address hunger and poverty in low-income countries (LICs) by increasing agricultural production. Its purpose was to provide scientific research addressed towards improving crop productivity. It focused on specific technical problems, in isolation from local political, social or environmental contexts. Its research agenda was set by scientists, though it was funded primarily by the aid budgets of industrialised countries. It assumed a linear model of research development and technology transfer.

Its founders framed it as a politically neutral scientific body providing internationally applicable research products, primarily in the form of new crop varieties. To support this work, PGR were collected and stored in Centre-run genebanks for the use of researchers and plant breeders, on the assumption that the resulting new crop varieties would be of generic use to poor farmers. New varieties were expected to replace farmers' varieties, but in this framing, genetic diversity was conserved by being bred into new crops. PGR were collected from farmers' fields, but questions of ownership were not considered by CGIAR or its Centres.

CGIAR did not question its own role in producing new varieties that were replacing genetic diversity in farmers' fields. Instead it positioned itself as providing a public service by collecting and conserving PGR and using it to increase genetic diversity in agricultural commodity crops. It made its research products freely available to both public and private sector actors.

CGIAR's international role arose from the geographical interdependence of genetic resources i.e. that staple crops in many countries are based on PGR that originated elsewhere. This interdependence underpinned CGIAR's framing of its international remit, including its role in enabling researchers to freely exchange PGR internationally.

These founding framings – of its role providing science to address poverty, and of its role in relation to PGR use and management – were challenged on numerous occasions. A few examples below highlight the directionality of CGIAR's policy decisions.

The first challenge arose when the Convention on Biological Diversity (CBD) was adopted in 1992. The CBD tasked national governments with protecting their own biodiversity. As a result, governments, farmers' groups and CSOs raised questions about the ownership of PGR held in CGIAR's genebanks. CGIAR could no longer define for itself its international role, but had to negotiate with national interests regarding the PGR it claimed to hold in trust on behalf of the 'international community'. At the same time, increased global interest in sustainability (c.f. UNCED, 1992) challenged CGIAR's international approach to crop development, raising questions about the environmental contexts within which its research outputs would be used.

The 1994 TRIPS agreement, which permitted IP rights in the agriculture sector, also challenged CGIAR's founding approach to the free exchange of PGR. This, alongside developments in biotechnology, increased private sector interest in the use and ownership of PGR for commercial plant breeding, and the potential economic value of CGIAR's PGR collections became apparent.

Taken together, these shifts raised questions of who benefitted from CGIAR's research outputs and its provision of PGR to other plant breeders. It brought into focus a key contradiction in CGIAR's founding framings: whether CGIAR's purpose was to reduce hunger and poverty, or to produce high-quality science. While the latter might lead to the former, it did not do so automatically. However, CGIAR's approach was predicated on an assumption that producing agricultural research outputs would contribute to alleviating hunger and poverty.

Proponents of participatory and farmer-focused research approaches questioned CGIAR's focus on producing internationally applicable research, rather than context-specific products, as a means to address food insecurity. In response, CGIAR expanded its remit to encompass some more context-specific research including natural resource management (NRM), but retained its core focus on crop (and livestock) breeding.

However, internal debate and external criticism continued. Competing narratives about CGIAR's role were presented in 1997, in a series of workshops and panel reports examining IP, biotechnology and ethical issues.

In these debates, CGIAR's Chair and the Private Sector Committee (PSC) articulated a position in favour of CGIAR expanding its work in biotechnology and supporting the expansion of IP regimes into LICs. The PSC explicitly called on CGIAR to reframe its public goods mandate. It argued that biotechnology was necessary for agricultural development, that the 'cutting-edge' science being developed by PS actors was vital to serve the needs of the poor, and CGIAR could play a key role in closing the technology gap between richer and poorer countries. It argued that CGIAR should engage with biotechnology to maintain its own scientific relevance. It also argued that economic development was best served by helping countries attract private sector investment and that CGIAR should facilitate this by supporting LICs to develop IP regimes. The highly political nature of this position was not acknowledged by CGIAR.

Conversely, the NGO Committee argued that CGIAR's continued narrow focus of improving yields was an inappropriate strategy for addressing complex and context-specific factors creating poverty. It argued that CGIAR should refocus its research priorities away from 'high science' and towards farmer-centred approaches. It considered that the expansion of IP regimes shifted research agendas towards commercialisable crops and enabled the appropriation by private actors of seeds and knowledge developed by farmers. It called on CGIAR to actively challenge the expansion of IP to ensure continued free access for poor farmers to a wide range of crop varieties.

Actors in this debate explicitly questioned whether CGIAR should engage in shaping IPR regimes or challenge the spread of IPR in the agriculture sector and support farmers' rights. CGIAR chose to side-step the issue by deciding to work within existing frameworks, thus standing aside from the profound conflict over directionality in agricultural development animating the alternative perspectives. It portrayed this decision as continuing its apolitical stance. However, by choosing to work within expanding IP regimes, and to work with PS actors, CGIAR in effect chose to support the dominant paradigm, rather than challenging it on behalf of poor farmers.

This choice of direction shaped research priorities and practices. In particular, using biotechnological methods for crop development requires molecular biological information. For the PGR stored in CGIAR's genebanks to be of use to PS actors, this information had to be extracted and shared. Where CGIAR's founding approach to crop breeding had taken seeds out

of their environmental contexts, biotechnological methods went a step further and took specific genetic traits out of the seeds. This led to seeds and their related information being stored and shared in formats that were accessible and relevant to researchers and breeders, but undermined access for informal plant breeders including small-scale farmers. It also privileged Western science-based forms of knowledge and an extractive approach to biodiversity conservation.

At the same time, participants in the 1997 Ethics and Equity workshop challenged CGIAR to look beyond merely producing research outputs to consider the impact of their research on their end goals and intended end-users. Debates in the workshop highlighted the lack of clarity about CGIAR's mission, who 'the poor' were, who benefitted from CGIAR's work and the difference between means and ends i.e. research outputs and poverty reduction. Additionally, participants questioned CGIAR's internal processes, particularly the opaque nature of its decision-making and accountability mechanisms, and exclusion of stakeholder groups that represented intended end-users from processes deciding its research direction.

The 1998 Third System Review challenged CGIAR's claims to be an apolitical organisation. It called on CGIAR to take positions on highly political issues such as IP; and to press for its preferred outcome in international negotiations on PGR management, such as those which eventually led to the Seed Treaty (CGIAR System Review Secretariat, 1998b). However, CGIAR continued to present itself in PGR debates as a purely technical advisory body despite holding clear policy positions about its preferred outcomes. In this way, it positioned itself as a neutral body but played an active role in regime formation.

CGIAR acted in international negotiations to keep as much PGR as possible publicly available without restrictions such as IP rights. It supported the creation of a multilateral system (MLS) for PGR exchange, and supported an understanding of 'benefit-sharing' in terms of the provision of new crop varieties and technologies to countries providing PGR into the MLS. Nonetheless, CGIAR genebank managers effectively acted as gatekeepers to the public. Additionally, CGIAR did not support attempts to strengthen farmers' rights and it retained its focus on *ex situ* conservation, defining its role as providing GPGs through maintaining the genebanks.

CGIAR's GPG mandate was directly debated during the 2000-1 reform process. Participants in a stakeholder consultation (see section 6.3.4) laid out contrasting understandings of CGIAR's purpose and role, framing the debate in terms of a clash between the goal of poverty reduction and the goal of producing GPGs. The debate encompassed questions of who

benefitted from CGIAR's research, and who should make decisions about CGIAR's research priorities. Participants considered how CGIAR's GPG mandate should be defined: whether GPGs should be understood as economic goods, or as societal outcomes. Participants also debated whether CGIAR should work at multiple local levels, to ensure the research outputs were relevant to the needs of end-users; or whether such activities were a form of development work, which were beyond CGIAR's remit. The PSC again called for CGIAR to rethink its GPG mandate; while NGOC called for public sector research to fill the gaps not addressed by market mechanisms.

These internal debates took place in the context of public controversies over the impacts of globalisation, including over the benefits to poor farmers of opening up LIC markets to global corporations. However, those globalisation processes were strongly supported by CGIAR donors such as the World Bank. CGIAR did not question this direction of change: even while asking questions about which groups benefitted from CGIAR's research; moreover the framework within which the research was delivered i.e. increasing globalisation, was not questioned.

The same questions about the relationship between GPG production and poverty reduction were set out again in debates in 2006-7. A key document (Ryan, 2006) defined GPGs narrowly, as research outputs chosen and provided by scientists, and it sought to argue that context-specific work did not fit within CGIAR's remit. Other papers exploring the relationship between GPGs and IP regimes (see section 6.4.5) focused on how CGIAR might access proprietary technologies held by PS actors, but did not engage with the issues of how to protect PGR held in the public domain, or associated Traditional Knowledge. Internal actors, including GRPC members and CAS-IP staff, expressed caution about the impact of extending IP regimes on small-scale farmers, but they were marginalised.

However, these documents started a debate about how GPGs should be delivered, which influenced the outcome of the 2008-11 reform.

The reform was shaped by donor pressure on CGIAR to demonstrate the impact of its research on development outcomes. Donors called on CGIAR to make explicit the relationship between its science products and its stated mission to reduce hunger and poverty, once again highlighting that there was not necessarily a clear path from one to the other. This provided an opportunity for CGIAR to examine issues arising from debates about its GPG mandate, including how GPGs might be delivered and how research priorities might be identified.

In response, CGIAR re-organised its work into Research Programmes (CRPs) designed around 'impact pathways' linking production of research with delivery mechanisms to enable outputs to reach intended end-users. It shifted its framing, rhetorically at least, by placing 'people' rather than 'science' at the centre of its objectives.

The new structure allowed for partnerships at multiple levels, and mechanisms to connect context-specific research priorities into global programmes, particularly through the 'system' CRPs. This created the potential for Centres to work in new ways with development actors and undertake contextual research, which had previously been marginalised.

A further key change was the development of new IP Guidelines, and the reframing of CGIAR's GPG mandate to fit with them. These changes enabled Centres to accommodate the commercial interests of potential new private sector partners. They enabled Centres to work with PS actors producing 'cutting edge' science and to develop partnerships with commercial bodies potentially able to provide the delivery mechanisms envisaged in the impact pathways. There is no indication that CGIAR saw any contradiction between its work providing research outputs for use by industrial agricultural TNCs, and its commitment to providing GPGs.

The scope of the changes was also limited by many long-standing factors affecting CGIAR's functioning. The process of designing CRPs was highly political, with Centres seeking to retain funding for their existing programmes. Research priorities were largely set by Centre scientists and Centres continued to be accountable to donors not end-users. Groups representing end-users were not included in decision-making structures, with donors, including private foundations, increasing their power. Decision-making processes remained opaque, with Centres empowered by the new IP Guidelines to decide unilaterally on commercial contracts that restricted access to research products.

The process of reframing CGIAR's GPG mandate did not include an examination of its PGR management. The GPG status of the genebanks and the work they did was not questioned, leaving CGIAR's focus on *ex situ* conservation unchallenged. Questions about who could access PGR, who benefitted from its conservation, what should be conserved, and in what form, were not considered. Instead, the founding framings of CGIAR's role in PGR management (i.e. that it should collect and conserve PGR for use by researchers and breeders) were reinforced.

CGIAR consolidated its position at the heart of global biodiversity conservation strategies by articulating a dual role for its genebank collections: providing inputs to crop breeding programmes, and providing a conservation and distribution service for the wider IAR community. CGIAR also recognised two aspects to this role: CGIAR was both a provider of

technical resources to inform new international policy development and an institution affected by those policies (CGIAR Consortium Office, 2011d). CGIAR did not examine whether Centres' interests regarding PGR ownership issues might be different across these multiple roles, or the political contestation over its choices regarding how to enact them.

CGIAR's PGR management work was brought together in the Genebank CRP, which focused on *ex situ* conservation. This, alongside the development of new technologies enabling genetic sequences to be stored digitally, further entrenched the long-standing extractive approach to PGR, privileging the role of researchers and breeders, rather than farmers in crop development. Socio-economic and policy issues raised by technological developments, including their impact on access, relevance and use of PGR by different groups, were not examined.

As a result of the 2008-11 reform, CGIAR reorganised its research programming, but generally continued to act in accordance with an agricultural development model predicated on bringing smallholder farmers into global value chains. This approach aligned with a globalising 'productivist', business-oriented model of agricultural development promoted by some of its key donors, particularly the WB and the BMGF. Despite a clear articulation of possible alternative approaches by IAASTD (IAASTD, 2009b), CGIAR did not change the directionality of its approach.

8.2.1. Persistence of founding framings

The data presented in Chapters Five, Six and Seven have described how the same issues were debated repeatedly in CGIAR. In those debates, narratives about policy options changed over time and across actors but underlying framing assumptions informing contrasting positions remained remarkably stable. CGIAR's research directionality has also remained constant, despite numerous challenges from both internal and external stakeholders.

CGIAR's founding framing of the value of PGR continued to underpin its approach to PGR management. In this framing, increasing agricultural productivity is essential to address food security and to reduce poverty; the value of PGR arises from its use in crop breeding; CGIAR has a central role to play both in conserving PGR and in identifying its value for future crop development; and biodiversity is conserved by inserting diverse traits into new crop varieties.

To do this, scientists extract genetic information from seeds. The founding framing separated the physical seed from its context, ignoring and/or devaluing the farmers' knowledge embodied in it, its socio-cultural significance and its interactions with other elements of its agroecological context, which together create biodiverse environments.

Additionally, by separating particular genetic characteristics from a seed, those genetic traits take on the form of an item of technology (or information) with an economic value, which can be privatised and traded (Feindt, 2013). As technologies have developed, this approach has led to enhanced opportunities for the commodification of PGR and its appropriation by commercial actors. Food sovereignty advocates consider that this process has led to the 'enclosure' of goods previously held in common.

The approach also increases the complexity of crop breeding processes, therefore excluding informal breeders or farmers who do not have the technical capacity to use PGR in its extracted form. CGIAR's narrative of maintaining the free availability of PGR has remained constant, but in practice, it has not been equally accessible to all potential end-users.

Several other elements of CGIAR's founding framing have also persisted, and core contradictions inherent in those founding framings have remained unresolved:

- The relationship between public and private sector actors:

CGIAR's founding framing identified a role for public science in undertaking activities, such as pre-breeding and biodiversity conservation, which could lead to commercialisable products. Such activities do not create financial benefit directly and therefore PS actors rarely engage in them, despite their importance for new crop development. In this model, public science becomes a service provider to the commercial sector. When public goods are understood in narrowly economic terms, this approach may be justified. However, it does not take into account where benefits can accrue. Additionally, CGIAR's approach has remained remarkably constant despite huge changes in the commercial seed sector, particularly the growth and consolidation of global agri-businesses. As private sector actors have increased their power to shape global seed markets, CGIAR has had to negotiate a space for public sector work within market-led development approaches. This has led it to articulate contradictory positions, including engaging with IP regulations to access research materials and protect public PGR collections; entering into exclusivity agreements when providing PGR to commercial actors; and working with private sector bodies to deliver its 'public good' research outputs to end-users through market mechanisms.

- The relationship between science production and poverty reduction:

CGIAR's main crop development programmes have continued to operate with a linear research pipeline model, assuming that the production of new crop varieties will lead to improved livelihoods. Its claim to focus its work on poverty reduction has been undermined by the

continued focus of these flagship programmes on producing context- and scale-neutral technologies not specifically targeted at addressing the needs and interests of poor farmers.

- Accountability to donors rather than end-users:

CGIAR's claim to serve the needs of resource-poor farmers has been undermined by the power of the donors to set research priorities. Through the 2008-11 reform, opportunities for farmers' groups and civil society organisations to participate in central decision-making structures were diminished.

- The apolitical nature of science production:

CGIAR's founding framing assumed that hunger was a technical problem, for which technological solutions could be found. This masked the political interests of its founding donors. Subsequently, although CGIAR has expanded its research portfolio to include programmes on social issues such as gender, institutions, policy frameworks and market barriers, its crop development programmes' core approach continues to frame its scientific research as politically neutral. As a result, CGIAR has repeatedly acted in ways that favoured the expansion of commercial industrialised models of agriculture into LICs. It has marginalised attempts by internal and external stakeholders to consider social justice or rights-based approaches to addressing hunger, but it has not acknowledged the politics of its approach.

- Support for the dominant model of agricultural development:

In the 1970s, development actors supported a model of economic development predicated on improving agricultural productivity by transferring technologies from industrialised agriculture models used in rich countries to LICs in the global South. From 2008 onwards, despite critiques of this model (e.g. IAASTD), it was strongly promoted by the WB, Gates Foundation, USAID, G20 and several public-private initiatives. CGIAR's technocratic approach to agricultural research fitted into this productivist and market-based approach to poverty reduction and food security.

As shown in Chapters Five, Six and Seven, CGIAR's approach to its GPG mandate and to its management of PGR were challenged repeatedly, and alternative approaches presented by both internal and external stakeholders. However, at each moment, CGIAR chose to act in line with its founding framings. Those positions also aligned with those of its major donors, and PS actors with which it partnered, including global agribusinesses. The perspectives of other stakeholders – as expressed variously by NGOC, GFAR, some donors and some staff – were either only given space to operate at the margins, or shut out completely.

Those moments of contestation revealed the power dynamics between CGIAR's different stakeholders. CGIAR's decisions to operate within the dominant model of agricultural development, rather than challenge it, show the relative lack of agency amidst structural power asymmetries of the actors promoting alternative views. CGIAR sought to align its research agenda with the direction of change in the global agri-food system. The data show that policy making in CGIAR – and the wider IAR field – has both been influenced by that direction of change, and has acted to reinforce it.

8.3. Analysis of findings and their relevance

The conceptual framework presented in section 4.2.2.5 outlines a policy process analysis approach. This provides tools with which to examine the interaction between factors influencing policy processes, specifically the interaction between narratives, actors presenting those narratives and their interests. Using it to analyse the thesis' findings reveals how

“...contextually powerful institutions assert particular narratives and framings, so that it is these that become interlocked with strategies of intervention and ensuing pathways of system change, marginalizing alternative narratives in the process.” (Leach et al., 2010b)

The analysis has shown how narratives about CGIAR's PGR management and its GPG mandate were upheld or challenged by different actors with varying political interests.

It has revealed different narratives about CGIAR's GPG role; the actors and networks associated with each narrative; the politics and interests of the different networks and the (different forms of) power they held; and the policy spaces within which policy-making took place and narratives were debated.

Using a narrative analysis approach, the various interpretations of CGIAR's GPG mandate by different actors have been identified. A recognition of the multiple meanings attached to the concept of GPGs has illuminated questions about how different – and often competing – understandings of the public good outcomes of CGIAR's work have influenced its policy making and institutional development.

The policy process analysis approach has enabled an examination of how competing interpretations of 'global', 'public' and 'good' contributed to the maintenance of policy directions about PGR management, and how these directions have been presented as apolitical. This conceptual approach has revealed how CGIAR's core policy approach was maintained, why other approaches were marginalised, and whose interests were served. These interpretations are discussed below.

8.3.1. Competing interpretations of 'global', 'public' and 'good'

Global

Chapter Three presented a discussion of diverse understandings of 'global public goods', and highlighted a normative understanding of GPGs described by Kaul et al. (199c, 2003). Their GPG theory defined a 'global' public good as a good that is, and can only be, provided through multilateral action; that provides benefits to more than one country, and more than one socio-economic group; that engages all relevant stakeholders equitably in deciding about what goods will be provided and how; and considers how mechanisms for providing goods affect their public nature.

CGIAR's approach to PGR management meets the first criterion: conservation of PGR requires multilateral action, beneficiaries are in more than one country and CGIAR has consistently championed a multilateral approach to PGR management. However, it has paid less attention to other criteria.

CGIAR's dominant framing of its GPG mandate has centred on providing internationally applicable research products. This has led to a focus on producing scalable technologies supposedly for the benefit of all, without disaggregation. However, when technologies are said to be 'neutral', they generally benefit those best able to take advantage of new opportunities. Unless technologies are designed specifically to meet the needs of resource-poor people, they are likely to increase inequalities. CGIAR has at different times highlighted the benefit of its research to industrialised countries (e.g. Pardey et al., 1996), or recognised that it has not considered differential costs and benefits across diverse socio-economic groups (Ryan, 2006).

CGIAR's focus on internationally applicable research marginalised context-specific, locally-developed research approaches, which were considered outside its scope. Instead it framed its research as contributing to finding technological solutions to food scarcity, and hence to hunger and poverty, globally aggregated, but did not engage with the politics of technology application in different contexts. This interpretation of the 'global' element of GPGs provided justification for claiming its research as 'apolitical'.

CGIAR has also paid little attention to the impact of how goods are delivered or their accessibility. In the 2008-11 reform, its GPG mandate was reconfigured to enable public-private partnerships to deliver products to end-users. However, choosing such delivery mechanisms did not take into account market power, which might crowd out alternative distribution routes and may reduce options available to end-users both in the market, and for those without resources to participate in formal markets. Additionally, such approaches do not

take account of the instrumental power of large seed and agro-chemical TNCs to shape the political and regulatory context within which policy decisions are made by national governments or research actors.

Public

Kaul et al.'s GPG theory defined the 'public' element of public goods as arising from the publicness of consumption and of decision-making about which goods should be provided i.e. participatory processes to identify what goods to provide, to whom and how; and consideration of how different answers to those questions affect the distribution of costs and benefits across different groups from the provision of the good. It highlighted the political nature of such decisions, raising questions about how different stakeholders in CGIAR have been able to influence policy processes, and the mechanisms for diverse perspectives to be heard.

CGIAR's decision-making structures have been dominated by donors and scientists and have included a limited range of other stakeholders. Those structures have often been opaque, with unclear lines of accountability. Farmers, or their representative organisations, have rarely been able to shape CGIAR's research agenda. By not engaging with a broader range of stakeholder groups in deciding research priorities, wider questions of the relevance of research products to different groups have not been addressed.

CGIAR has often acted to keep PGR 'freely available' i.e. access is not restricted by patents or other IP mechanisms. However, this approach has obscured questions of the accessibility of PGR to different groups, based on the form in which it is available. Seeds held in genebanks, and digital information about their characteristics, are more easily accessible for researchers and commercial breeders than for small-scale farmers or breeders operating in the informal sector. Similarly, sharing research outputs in academic journals puts them in the public domain but provides limited accessibility for farmers and other end-users. CGIAR's failure to consider the range of publics its research might serve means that questions of how to reach different groups have received little attention.

CGIAR's approach to crop breeding has been predicated on the separation of seeds from their contexts, valuing genetic characteristics of a crop rather than its social, cultural and environmental characteristics in the context in which it is used. In this framing, the place of a crop in a specific society was not considered and the contexts of different farming communities have been rendered invisible. Social, political and equity issues arising from the introduction of new technologies into particular contexts remained under-examined.

CGIAR has made its research outputs freely available to both public and private sector researchers and plant breeders. In doing so, it has not considered issues of equity in access or outcome. Its work has often benefitted private actors, with uncertain impacts on 'the poor'. For instance, the chair of CGIAR's Private Sector Committee (quoted in Ozgediz, 2012, p.80) reported the importance of CGIAR's breeding lines to the success of his commercial biotechnology company. This is very different from working directly with resource-poor farmers to identify their needs and ensure their access to relevant inputs.

Additionally, CGIAR has not considered the impact on equity of the changing shape of global seeds markets. It has continued to work with commercial agricultural input companies as they have become increasingly consolidated and market power rests in the hands of a small number of global companies. Its approach to addressing poverty through economic development does not engage with questions of the direction or beneficiaries of development, or the equity of economic growth between different groups.

Good

Kaul et al.'s GPG theory defined the 'good' of a GPG as arising from a consideration of the outcome of its provision i.e. equitable social benefit to diverse groups. This is closely linked to the concept of directionality, which considers the possibility of different social groups prioritising different societal outcomes; and the possibility of different pathways to achieving diverse social outcomes. Participation in identifying goals and pathways is a key factor in the 'good'-ness of resulting technologies.

Provision of public goods extends beyond producing new crop varieties and distributing them to farmers. It requires examining whether those varieties can meet farmers' needs. Whether a new variety is a crop 'improvement' depends on what qualities of the crop are relevant in any given context. When decisions about what to 'improve' are taken by a limited group of stakeholders, they may not meet the needs of diverse groups of farmers.

CGIAR has primarily operated within an agricultural development model that seeks to bring smallholders into global value chains. In this model, a seed variety is valued for qualities such as stability, uniformity and replicability, which enable farmers in different locations to provide the same product into value chains. However, such products may not meet the needs of farmers employing diverse livelihood strategies or operating in marginal agroecological contexts. CGIAR has not adequately considered the different priorities and interests of diverse publics, because it has maintained a focus on an undifferentiated 'public' defined as a generic and undifferentiated 'international community'.

Directionality

The thesis has used concepts of directionality, distribution and diversity (see section 4.2.2.6) to illuminate understandings of factors influencing policy decisions in CGIAR. These concepts incorporate considerations of the distribution of costs and benefits across different groups, and of the need for multiple policy approaches to meet the needs of diverse groups.

Directionality considers the end goal of policy i.e. the direction of change resulting from policy decisions. It focuses attention on "...the fact of there being alternative possible orientations for progress." (Stirling, 2009, p.5). This challenges assumptions that the direction of progress is fixed by forms of scientific and technological development.

It raises questions of why one technology rather than another is chosen and supported by institutional and economic infrastructures. It enables an examination of how power relates to the choices made, and the political space available to choose between possible directions. These concepts bring into view political contestation over policy goals and alternative pathways to their achievement.

Data have shown that CGIAR maintained a science-led linear model of research production, marginalising calls for the uptake of alternative approaches. One of its founding framing assumptions, that the science it produced was of benefit to all, rendered invisible the possible different impacts of its policy decisions on different groups. It acted to retain a position at the 'cutting-edge' of scientific development, focusing on the production of new technologies rather than on the production of technologies addressing needs identified by the intended end-users of its research. Through this approach, addressing poverty and food insecurity remained an add-on to the central concern of producing new science (c.f. Feldman and Biggs, 2012b).

The ambiguous nature of CGIAR's GPG mandate contributed to a lack of clarity about what it should be doing, for whom and how. This led to its research directions being dictated by donor priorities and available funding, and by external policy shifts rather than by a clear focus on its end goals. In failing to ask 'who benefits' from its research outputs, CGIAR failed to examine power dynamics between different interest groups. Instead, it framed its role as apolitical and technical, claiming that the science it produced had no political consequences. By failing to challenge dominant models of agricultural production, it served to uphold them. It did not question one of its founding framing assumptions, that it produced breeding lines to support the expansion of industrial agriculture, even as power dynamics in the global agri-food system shifted and global TNCs reshaped agriculture systems in LICs. Its interest in producing globally

applicable technologies aligned with processes of global integration of agricultural input markets. It therefore acted in support of the 'corporate food regime' (see section 2.2). CGIAR's approach to its GPG mandate did not see it question this dominant paradigm.

Applying the thesis' conceptual framework to the data has revealed that CGIAR's approach to PGR management has focused on a narrow framing of the 'global' element of its GPG mandate. This has driven policy directions and research priorities, undermining opportunities to explore different aspects of 'public' and 'good'. Broader conceptualisations of its GPG mandate were presented at various times by participants in debates about CGIAR's research direction, but were not adopted by CGIAR. Instead, the narrow framing of CGIAR's GPG mandate was supported by powerful actors, whose interests were served by maintaining a limited interpretation of GPGs. For instance, the continuation of a science-led, top-down model of crop breeding enabled the commodity Centres to maintain their central role in CGIAR's research agenda. Similarly, the contribution of CGIAR's research to the maintenance of a market-led productivist model of agricultural development aligned with the vision of the World Bank and other powerful donors and their promotion of globalisation.

Different narratives about CGIAR's GPG mandate have been used at various times, but its research directionality has not changed. Instead, it has maintained a framing of its role centred on a science-led productivist paradigm of agricultural development. In doing so, it has not engaged with, or acknowledged, how that approach upholds and even reinforces power dynamics shaping the global agri-food system.

8.3.2. Relevance to wider food system questions: the maintenance of a dominant paradigm

CGIAR operated within a context of changing governance structures in the global agri-food system. Debates about the direction of CGIAR's research took place within the parameters of increasing globalisation. While some proponents of globalisation recognised that it might have negative impacts on some groups, this did not influence the direction of change. One of the key actors promoting the globalisation project has been the World Bank, which called on actors such as CGIAR to make globalisation work for all (c.f. section 6.3.4) i.e. act to mitigate the negative impacts of the chosen direction on vulnerable groups.

The WB was a founding sponsor and core donor of CGIAR. It held power within CGIAR to shape its policy directions, alongside other key actors such as USAID and more recently BMGF. Those donors jointly promoted a market-led model of development predicated on liberalising global trade and opening up LICs' agriculture sectors to international markets. Alternative

perspectives gained little traction within CGIAR, even when presented by bodies representing large stakeholder groups (c.f. FAO and GFAR positions in 2011 debates on IP policy, see section 7.5.1). CGIAR had to act in line with the interests and agenda of its main funders, and therefore those power holders in CGIAR were able to shape public IAR to support their chosen model of agricultural development.

Those same actors also held power to shape the external direction of change in the global agri-food system, limiting the policy space within which CGIAR was able to make decisions. CGIAR member governments were deciding on CGIAR's policy directions at the same time as acting in other fora (e.g. UN bodies) to agree global regulatory regimes within which CGIAR had to operate and to which CGIAR policy responded. In this way, debates in CGIAR were a microcosm of contestation in the wider global agri-food system. The same debates took place in CGIAR and in the wider system, and the same actors participated in debates at both levels.

In this context, the space to articulate alternative approaches was reduced. Actors challenging the 'universalising' framing of agricultural development, and calling for multiple and context-specific approaches increasingly operated outside 'mainstream' debate (e.g. NGOC withdrawal from CGIAR, see section 6.3.4). In this way, CGIAR has shaped, and been shaped by, evolving governance structures and power dynamics in the global agri-food system.

Conflicts in CGIAR between different approaches to fulfilling its mandate reflected and replicated long-standing debates in the wider global agri-food system about how to address hunger and poverty in LICs. IAASTD (2009) described the different views as "...two relatively independent pathways to agricultural development...", globalisation and localisation (IAASTD, 2009a, p.147). IAASTD described globalisation approaches as focusing on aggregate global levels of food production and integrating global markets; and localisation pathways focusing on social and environmental issues as well as technical agricultural production concerns, seeking to integrate contextual factors into policy options for agricultural development.

The thesis has demonstrated how the dominant globalisation framing retained its dominance within and throughout CGIAR's policy-making processes. Alternative framings sought to engage with complex contexts and diverse groups to ensure that CGIAR's research products met multiple needs. However, as described by Laws and Rein (2003) and Roe (1994) (see section 4.2.2.3), the inherent complexity of alternative framings reduced their power.

Framings that take account of multiple factors affecting poverty and hunger at different scales present diverse narratives. The power of a single, linear globalisation narrative derived in large part from its simplicity.

CGIAR has had opportunities to refocus its research to address social outcomes and challenge dominant productivist paradigms of food system functioning. But instead it has realigned its GPG mandate to maintain a steady research directionality. An examination of the moments when alternative framings were in contestation has illuminated power dynamics within CGIAR and within the wider agri-food system within which it operates.

8.4. Answers to research questions

The research questions set out in section 4.2.2.8 are answered below:

- (1) How did the role of, and strategy for, public IAR evolve in the light of the changing structure of, and pressures on, the global agri-food system between 1990 and 2012?

The thesis has described the disruptive impact of

- new regulatory regimes to manage ownership and exchange of PGR
- the development of biotechnology
- the expansion of private sector actors into areas of IAR previously undertaken by public sector actors and the associated expansion of IP regimes into those areas
- increasing integration of global agri-food markets and donor support for market-led approaches to agricultural development.

These all acted to change relationships between public and private actors in IAR, putting pressure on public IAR to engage with private actors in new ways. This has involved renegotiating the role of public IAR within the space left by corporate actors. However, the narratives describing the role of public IAR have stayed remarkably static, while strategies to maintain the role, relevance, and related funding, have changed significantly.

In particular, its role in relation to PGR management has changed little, despite the increased involvement of private sector actors in crop development. Public bodies continue to maintain genebank collections, conduct 'pre-breeding' and facilitate the flow of PGR to researchers and breeders. These roles are now framed as part of global biodiversity conservation strategies, with public bodies managing PGR for use by both public and private actors at local to global scales.

- (2) How was the concept of 'public goods' and CGIAR's role as provider of 'global public goods' framed by different actors in IAR at different times?

Concepts of GPGs have been fluid across different time periods and have frequently been poorly defined. Different actors have framed them in different ways, which has led to contestation over what research CGIAR should conduct to deliver on its mandate to produce

public goods; and contestation over policy choices for managing PGR it holds as public goods. Ambiguity over what GPGs are has meant the term has been used to justify maintaining a science-led model of research production. CGIAR has been able to claim it upholds its public goods mandate by shifting what it means by that expression according to context. It has adapted its understanding of its public goods mandate in order to maintain the directionality of its research.

- (3) How did competing framings of CGIAR's role as a provider of 'global public goods' influence, and/or were influenced by, policy choices regarding its management of Plant Genetic Resources and Intellectual Property?

Actors within and external to CGIAR have attempted to question how the term 'public goods' has been used; and have attempted at different moments to question the focus of, and direction of, CGIAR's research agenda. These actors have included NGOs such as GRAIN, networks such as GFAR and scientists working on NRM. These attempts have been marginalised and repeatedly shut down.

CGIAR has acted to maintain its role in PGR management and the directionality of its research in the face of increased private sector engagement in IAR. In this context, to maintain its approach to, and central position in, global PGR management, it has reframed its public goods mandate, and its IP policies. Therefore, its policy choices regarding PGR and IP management have shaped its framing of its role as a provider of public goods. However, its approach to PGR management, which it has sought to maintain, has been based on its founding framing of its role as a provider of GPGs.

CGIAR's focus on the 'global' element of GPGs has led to a focus on technologies with the potential to be 'internationally applicable', marginalising context-specific approaches to crop development and biodiversity conservation that may more directly respond to farmer needs; and may retain farmer control over PGR and related knowledge.

CGIAR's framing of its GPG role in terms of maintaining 'public' access to PGR has marginalised alternative understandings of GPGs in terms of the social benefits potentially arising from the development of (different kinds of) agricultural knowledge and technologies. At the same time, concepts of 'public' have not been interrogated, so the public(s) CGIAR serves has not been identified, enabling it to produce generic 'internationally applicable' research outputs.

Understandings of GPGs in terms of 'goods' with potential economic value has focused resources on characterising molecular information about PGR, putting it in a form most readily

accessible by researchers rather than farmers. CGIAR has changed its IP rules to fit with this approach to its understanding of GPGs.

- (4) What are the implications of these policy choices for the direction of change in public IAR and for its intended end-users?

CGIAR's framings of its GPG role have shifted in ways that have aligned it with the dominant paradigm of the functioning of the global agri-food system, rather than challenging it. The implications are that its research priorities will continue to address interests of powerful actors promoting the expansion of a corporate food regime into low-income countries. The benefits of this approach to broader societal goals, including reducing hunger and poverty, are highly problematic and contested.

The dominant model of agricultural development is based on an assumption that private actors, working through market mechanisms, can and will deliver needed technologies to small-scale farmers, thereby enabling them to increase their incomes. It reinforces processes of globalisation and corporate concentration taking place in the global agri-food system. This marginalises the interests of resource-poor farmers who may not be able to access markets either for inputs or with outputs; and farmers working in environmental conditions for which commercially available products are not appropriate. In addition, a technocratic science-led approach to agricultural development masks power dynamics and political processes that contribute to and maintain poverty.

Technologies developed in the past have often been of greater benefit to farmers able to access them and use them in commercial settings i.e. richer farmers, and often farmers in industrialised countries. This is likely to continue, reducing the potential impact of new research to address poverty and hunger.

Finally, research and knowledge production supporting alternative framings of food system functioning, based on farmers' needs and legal rights, remain at the margins of public IAR, and receive inadequate funding.

8.5. Policy implications and recommendations

This thesis has argued that the dominance of a science-led approach to international agricultural research (IAR) has limited the diversity of research directions pursued to contribute to addressing hunger and poverty. Recent studies (Nature Plants, 2020) have reported that most research projects still do not include farmer participation (though CGIAR is responsible for many that do) and a large proportion of research focuses on developing new

technologies rather than examining the effectiveness of existing interventions. As a result, the researchers

“...found that the overwhelming majority of studies they assessed — more than 95% — were not relevant to the needs of smallholders and their families.” (Nature, 2020).

This indicates that current approaches to providing the products of science for development are not working for the intended end-users. It suggests an urgent need for IAR to focus directly on the needs of small-scale farmers in their diverse contexts.

The thesis has demonstrated the stability of narratives about how science might contribute to development outcomes. It has described how dominant approaches have shaped what knowledge is valued and what research is funded. This has created opportunity costs: when the majority of public and private IAR has been directed towards the needs of globalised agricultural trade, fewer resources are available to undertake research into the effectiveness of other approaches.

The thesis has examined different framings of CGIAR’s GPG mandate and has shown the limitations of its dominant framing of that role in shaping its research towards achieving development outcomes. The thesis has also shown that alternative perspectives on CGIAR’s role (e.g. that it should engage in context-specific work and work directly with farmers) encompass many elements of GPGs described in the literature. Additionally, it has shown that CGIAR’s stakeholders frame its GPG mandate in diverse ways. CGIAR could therefore adopt a broader, more complex framing of its GPG mandate to incorporate concepts of providing goods to multiple diverse publics and expanding participation in decision-making about research directions. It could reconfigure its GPG mandate to make the normative goals of its research explicit. This could enable it to make deliberate and active policy choices to move its research agenda towards those goals.

However, the thesis has also demonstrated that numerous past attempts to change CGIAR’s direction have failed, and that narrow framings of its GPG mandate, and of the relationship between science and development, have remained dominant. This is because internal and external voices calling for different approaches have consistently been excluded from decision-making processes. CGIAR has, throughout its history, been accountable to its donors rather than to its end-users. Therefore, new mechanisms would be needed to transform CGIAR’s lines of accountability to incorporate the interests of those for whom it claims to be working.

This will require a fundamental restructuring of governance mechanisms at the central level, and between central bodies and end-user communities.

- Central structures should be reconfigured to provide a permanent and influential voice for resource-poor farmers, or their representative groups, in decision-making structures.

But including farmer perspectives is not sufficient: they must be included at the centre of decision-making processes. The power of donors and private sector actors to influence research directionality will correspondingly need to be reduced.

- CGIAR should establish an inclusive and participatory decision-making body, learning from experiences in bodies such as the Committee on World Food Security and its Civil Society Mechanism to develop appropriate processes.
- New mechanisms should be created to decentralise IAR priority-setting and to enable decision-making at local, national, regional levels to shape research directions. The design of such mechanisms should be informed by lessons learnt from past attempts to do this e.g. in GFAR.

DFID's 2013 review of its agricultural research funding stated that "...maximising benefits for poor farmers and women should be central to project design..." (ICAI, 2013, p.10). The review reported that a minority of CGIAR projects successfully took this approach. Some internal CGIAR actors have consistently championed farmer-led, participatory research approaches, but these perspectives have remained at the margins of CGIAR's work. It is essential that mechanisms are developed that bring this approach to the centre, enabling it to inform CGIAR's agenda-setting processes. This will complement central organisational changes, enabling a wide range of perspectives to influence research agendas from the top down and the bottom up. To do this, CGIAR should:

- Build on learning from System CRPs to develop multi-stakeholder processes to identify relevant research questions, and their solutions.
- Strengthen existing approaches that focus on access and applicability issues e.g. the Triple A Framework for knowledge-sharing
- Work more closely with existing initiatives that focus on research solutions for a wide range of smallholder livelihood strategies e.g. PROLINNOVA
- Work closely with NARS to build their capacity to identify local needs, adapt technologies to local contexts and develop local and national accountability systems.

Donors have played a key role in shaping CGIAR's research agenda. They have demanded that CGIAR demonstrate the impact of its research, but have defined 'impact' within the limits of

the dominant productivist agricultural development paradigm. To support CGIAR in producing research relevant to the needs of smallholder farmers, donors should:

- Commit to upholding their own stated standards (e.g. BMGF (2010) presents guidelines to applicants calling for projects to identify target end-users, and specify how they have been consulted)
- Broaden the range of metrics by which CGIAR measures impact and whether they mitigate against consideration of local impacts e.g. publication of research results in peer-reviewed journals prioritises different research interests from measurements of impacts on farmers' livelihoods.
- Take into consideration concepts of plural publics i.e. move from global, aggregated measures of impact to examine local and specific impacts on identified target groups. This will require donors to reconfigure their expectations of the impact of science production on development outcomes, particularly the focus on identifying technologies that can be 'scaled up'. Widespread adoption may well be desirable, but it should not be deemed to be necessary.

Finally, CGIAR's approach to PGR management should be expanded to incorporate broader conceptualisations of GPGs. The value of farmers' knowledge must be recognised and research on *in situ* biodiversity conservation should be expanded. CGIAR should work with farmers to develop new varieties well-adapted to local environments, in recognition of the increasing importance of local biodiversity conservation to reducing risks to farmers' livelihoods from the uncertainties created for example by climate change. *In situ* conservation can support farmers' livelihood strategies, conserve biodiversity and support adaptive capacity within diverse agroecological contexts.

8.6. Conclusions

This thesis has sought to understand how international public agricultural research bodies have chosen their goals and priorities, in the context of contested models of agricultural development. It has examined how a major publicly-funded international agricultural research body, CGIAR, has decided its research directions and priorities. It has shown that key donors have held power to make decisions about what sort of research CGIAR undertakes, with whom and how. The thesis has shown that poor farmers and their representative groups have been excluded from policy-making structures and have had little influence in shaping decisions about research priorities. As a result, farmer-focused, context-specific research has been marginalised, despite repeated calls from internal and external stakeholders for CGIAR to re-

direct its resources to addressing problems faced by small-scale resource-poor farmers. The thesis has also shown that CGIAR has consistently side-stepped examination of the political implications of its chosen research directions, and has framed its role as apolitical.

The thesis has shown that there were multiple and vague understandings of CGIAR's GPG mandate and what that mandate implied for its research directions. This ambiguity enabled CGIAR to maintain a seemingly-stable policy position in relation to the use and management of PGR. In particular, CGIAR's emphasis on its global responsibilities undermined attempts to broaden approaches to addressing the interests of different groups i.e. multiple publics. That framing of its global public goods mandate resulted in a policy alignment with dominant, market-based, paradigms of agricultural development. Its focus on the production of goods that could be universally applicable reduced opportunities for research addressing the diversity and complexity of agroecological contexts within which smallholder farmers build their livelihoods and it has led to the neglect of opportunities to explore alternative pathways to development.

8.7. Contribution

This thesis makes contributions to knowledge about the case study organisation, CGIAR and the wider IAR context within which it operates, and contributes insights into the interactions between actors shaping the global agri-food system. It also makes contributions to broader literatures and policy debates.

CGIAR as an institution has been subjected to surprisingly little academic scrutiny. Much of the literature about it has been written by insiders (e.g. McCalla, 2014, Ozgediz, 2012) and has focused on its organisational development rather than what it does and why. This research has contributed an in-depth examination of CGIAR's policy-making processes relating to PGR management and explored questions of why it operates as it does.

CGIAR has been critiqued for its participation in supporting productivist approaches to agricultural development within an incumbent corporate food regime (e.g. Holt Giménez and Shattuck, 2011). This thesis has confirmed those critiques and added insights into internal and external pressures maintaining its alignment with dominant models of food system functioning. The thesis has demonstrated not only that CGIAR acts within the corporate food regime, but has contributed additional understandings of how the corporate food regime acts within CGIAR.

The research has built on, and extended, the work of Pistorius and van Wijk (1999) in applying a political economic analysis to questions of the use and control of PGR. Their work focused on

the role of nation states in deciding agricultural development directions. This thesis has considered similar questions about the role of publicly-funded IAR, and the factors leading to policy decisions about the contents and directions of agricultural research. It has similarly identified the importance of the exercise of power in shaping policy decisions on PGR management, highlighting the increasing influence of new actors in the field i.e. agro-industrial corporations and philanthro-capitalist foundations.

The thesis has contributed to understandings of the reshaping of global PGR conservation frameworks in the context of the rise and dominance of a corporate food regime. It has shown the role of public IAR bodies in supporting the expansion of the corporate food regime through enabling the extension of IP regimes into new areas of PGR use and control. In this way, the study of CGIAR's policy processes has increased understanding of power dynamics shaping approaches to PGR use and management, and agricultural development more broadly.

The thesis has extended Brooks' (2010) exploration of CGIAR's understandings of the value of internationally-applicable research, through a specific examination of different framings of its GPG mandate. It has identified a core contradiction at the heart of CGIAR's founding approach: between monolithic research outputs intended to be globally relevant and the diverse and complex contexts in which those products are intended to be used. Its approach to crop development, predicated on extracting PGR from its agroecological context and transforming it into genetic traits that may be bred into new crop varieties, is an exemplar of this contradiction.

Brooks further identified CGIAR's continued framing of its GPG mandate in terms of the provision of cutting-edge science to address complex development problems, despite many challenges to that approach. This thesis has confirmed the resilience of that framing and has added an analysis of the factors enabling the maintenance and increasing dominance of that perspective. These include the interests of powerful donors and other actors, and the interactions between IAR bodies and changing global frameworks governing the wider agri-food system.

The thesis has contributed to understanding why some forms of agricultural technological development have been supported while other approaches have been marginalised. It has done this by using a policy process analysis framework to examine CGIAR's application of its GPG mandate, and by placing that analysis in the context of the rise of globalisation and a corporate food regime. The research's findings about the application of power to maintain dominant paradigms are relevant beyond the context of IAR and the agricultural sector. The

case study of CGIAR has demonstrated that alternative approaches (e.g. participatory research) remain at the margins because power dynamics supporting the dominant system reduce opportunities for actors to support alternative models.

The thesis has used insights from literature on the maintenance of dominant paradigms to examine factors influencing CGIAR's policy decisions. It has used narrative analysis methods to reveal that narratives about CGIAR's role in PGR management have changed over time, while underlying framing assumptions informing those narratives have remained stable. This has provided empirical evidence to support theoretical understandings of paradigm maintenance (Broad, 2006).

The thesis has provided empirical evidence to extend understandings of the politics of policy spaces within which decisions about the direction of IAR have been taken. It has shown that the concurrent development of different regulatory regimes, and the actions of powerful actors within those different regimes, reduced the space available for alternative directions to be chosen. It has contributed insights into the exercise of power at key moments when opportunities for changing direction arose.

The application of policy process analysis to the case study of CGIAR has provided a valuable lens through which to examine interactions between different stakeholders negotiating over policy positions. It has revealed inconsistencies and ambiguities regarding framings of CGIAR's GPG mandate. It has enabled the identification and examination of multiple interests within IAR, particularly revealing important directions not taken by CGIAR, and those interests not served by its framing of its GPG mandate. The framework also enabled an analysis of the power dynamics shaping CGIAR's policy processes in the context of factors influencing the shape of the wider global agri-food system.

Through the use of this conceptual framework, the thesis was able to examine the dynamics of policy making in IAR and the research directions chosen as a result; and the implications of those choices for the intended end-users of agricultural research.

8.8. Usefulness of conceptual and methodological approach

The thesis applied the conceptual framework outlined in Chapter Four to the case study of CGIAR's policy-making processes on the management of PGR and on the production of GPGs. The research examined the interactions of CGIAR stakeholders in policy-making in the context of changing global governance frameworks for food and agriculture. The conceptual and methodological approach chosen aimed to address questions of directionality in policy-making: whether – and if so how – a policy approach was maintained and why other

approaches were excluded. It examined whether CGIAR policy-making processes could be considered as an illustration of wider policy dynamics and shifts in global agri-food system governance.

The narrative analysis approach provided a useful tool with which to examine how stakeholders in CGIAR framed its GPG role at different times. It revealed that many internal stakeholders had adopted a limited framing of CGIAR's GPG mandate. It helped to identify which aspects of GPG provision actors in CGIAR did not consider. Stakeholders arguing in favour of undertaking context-specific research rarely used the terminology of GPGs, instead often challenging the relevance of GPG production to addressing poverty and hunger. They raised questions such as who benefitted from CGIAR's research and to whom was it relevant. The narrative analysis approach revealed these alternative interpretations and enabled an examination of what was missing from CGIAR's framing of its GPG mandate.

This included understandings of CGIAR's approach to PGR management. This aspect of CGIAR's work largely escaped internal scrutiny, being considered uncontroversially a GPG. Narrative analysis revealed that CGIAR therefore did not adequately consider issues of access, relevance or applicability of its PGR-based research products for different potential end-users.

Insights from GPG theory (described in Chapter Three) were valuable in raising questions of 'which publics?' and 'what goods?', and were therefore useful in addressing Research Question 2. The conceptual framework presented in section 4.2.2.5 enabled an examination of interactions between competing narratives about CGIAR's GPG mandate and the interests of diverse stakeholders presenting alternative views. This enabled a consideration of questions of directionality, power dynamics and the wider context within which CGIAR was making policy decisions.

The policy process analysis framework facilitated an examination of the interests of donors and other stakeholders in supporting the provision of some forms of goods rather than others; and power in decision-making within CGIAR. The concept of directionality helped reveal how dominant framings of CGIAR's GPG mandate separated out the provision of goods (research products, knowledge) from the end goals to be achieved through their provision i.e. social benefits. The concept of diversity helped reveal that goods provided may hold different values for different groups. Examining distribution issues helped to reveal the need for multiple approaches to provide varied goods to different end-users. Consideration of the interaction between actors, narratives and political interests enabled an examination of the relationship between CGIAR's internal decision-making processes and power dynamics in the wider global

agri-food system. The conceptual framework therefore provided appropriate tools to answer the remaining research questions.

It enabled an examination of why some technology directions have been supported by institutional and economic infrastructures, rather than others. It helped to illuminate directions not taken, questions not examined and stakeholders not included in decision-making processes, particularly groups representing the intended end-users of CGIAR's research. It helped to reveal the possibility of other directions, and power dynamics shaping the political space to make choices about directions of food system development.

The research used a case study approach, using a narrative analysis approach to reveal positions held by different actors within CGIAR on key issues across three time periods. The conceptual framework was then applied to the narratives and their underlying framings. This approach revealed which framings of CGIAR's 'public good' mandate were not followed, and which stakeholders had more (or less) power to influence decisions. However, the narratives were often convoluted, contradictory or interlinked and contestations over relevant issues did not fit neatly into the chosen time periods. The narrative analysis approach was therefore difficult to apply.

The research examined CGIAR's decision-making processes, focusing on interpretations of CGIAR's GPG mandate. However, multiple other factors, such as funding, external pressures, organisational conflict and scientific developments also influenced policy choices. The policy process analysis approach was a valuable tool in bringing out these different factors and enabling an examination of their interaction with narratives and stakeholders' interests, and their relative importance in shaping policy decisions.

8.9. Limitations

This thesis has examined CGIAR's central policy-making approaches. From that examination, it is clear that different Centres responded to those policies in various ways, adapting, developing or sometimes ignoring them. However, the thesis has not examined how policies were implemented by different Centres or considered the dynamics of policy-making across different levels of the CGIAR system. The power dynamics between different Centres and their relative influence in shaping central policy decisions has not been explored.

Additionally, a focus at central level does not reveal the broad range of CGIAR's programme work. Similarly, a focus on its flagship crop development programmes did not engage with its work on agroforestry, fisheries, livestock and other areas. The thesis has argued that CGIAR's focus on crop development work has marginalised other research areas, but a limitation of the

approach taken in the thesis is that those areas of work are marginalised in this study.

8.10. Areas for further research

The thesis has examined CGIAR's policy decisions relating to PGR and IP from 1990 to 2012. Since 2012, CGIAR has undergone organisational restructuring, changing its decision-making structures and reorganising its research programmes. An obvious area for further research is to extend the study up to 2020, to examine CGIAR's responses to new frameworks such as the UN Sustainable Development Goals, and increasing pressures on the food system arising from climate change and the extinction crisis.

Similarly, contestation over access to genetic resources and associated information have continued, particularly in the light of technological developments enabling information about genetic sequences to be stored digitally. The management of genetic sequence data (also called digital sequence information – DSI) was a key issue of contention at the Seed Treaty's 2019 Governing Body meeting. The sharing of DSI raises important issues about the politics of ownership of data extracted from seeds held in the public domain. It would be valuable to undertake further research examining the role of CGIAR, the Crop Trust and its off-shoot DivSeek in these issues affecting the implementation of the Seed Treaty.

The thesis focused on CGIAR's central policy-making processes and did not examine relations between CGIAR Centres and national agricultural research systems, or national level policy frameworks. However, CGIAR has provided technical and policy support to NARS and to national governments regarding plant variety protection regimes. These have often been controversial, with seed sovereignty campaigners arguing that the requirements of international frameworks such as UPOV undermine informal seed systems and farmer innovation, instead facilitating external corporate entry into seed markets in LICs (Peschard and Randeria, 2020). CGIAR's approach to navigating this context of contestation over seed systems warrants further research.

The thesis has examined CGIAR as a case study of a large institution acting to maintain its position and relevance through changing political and policy frameworks and donor priorities. It has shown CGIAR struggling to balance its foundational framings with new normative demands. It may be valuable to apply a similar approach to other bodies with a similar long history. A relevant example may be Oxfam, which was established to provide a humanitarian response to war and hunger, but has subsequently extended its work into long-term development programming, campaigning and policy advocacy.

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Appendix One: CGIAR's evolving mission statements 1984 - 2012

Year	Vision or Mission Statement	Source
1984	"The purpose of the research effort is to improve the quantity and quality of food production in developing countries."	(CGIAR Secretariat, 1985, p.1)
1994	"The vision of the CGIAR is to contribute to the alleviation of poverty and the elimination or reduction of hunger. The CGIAR will articulate this vision to demonstrate that agriculture is a catalyst of sustainable development with a multifaceted impact on poverty, hunger, food security, and natural resource management. Agricultural research, which creates new technologies, is an essential precondition for agricultural development."	(CGIAR Secretariat, 1994, p.4)
1996	"The vision of the CGIAR is for its research to have a positive impact on food security, income and employment generation, and conservation of natural resources and the environment. The defining terms of this vision are: less poverty; a healthier, better-nourished human family; reduced pressure on fragile natural resources; and people-centered policies for sustainable development."	(CGIAR Secretariat, 1996, p.7)
2000	"Our mission: To contribute to food security and poverty eradication in developing countries through research, partnerships, capacity building, and policy support, promoting sustainable agricultural development based on the environmentally sound management of natural resources."	(CGIAR Secretariat, 2001, p.1)
2004	"The Consultative Group on International Agricultural Research (CGIAR) is a strategic alliance of countries, international and regional organizations, and private foundations supporting 15 international agricultural research Centers that work with national agricultural research systems and civil society organizations including the private sector. The Alliance mobilizes agricultural science to reduce poverty, foster human well-being, promote agricultural growth and protect the environment. The CGIAR generates global public goods that are available to all."	(CGIAR Secretariat, 2005, p.1)
2008	"Vision: To reduce poverty and hunger, improve human health and nutrition, and enhance ecosystem resilience through high-quality international agricultural research, partnership and leadership. Strategic Objectives Food for People: Create and accelerate sustainable increases in the productivity and production of healthy food by and for the poor. Environment for People: Conserve, enhance and sustainably use natural resources and biodiversity to improve the livelihoods of the poor in response to climate change and other factors. Policies for People: Promote policy and institutional change that will stimulate agricultural growth and equity to benefit the poor, especially rural women and other disadvantaged groups."	(CGIAR Secretariat, 2009, p.11)
2012	"CGIAR is a global partnership that unites organizations engaged in research for a food-secure future. CGIAR research is dedicated to reducing rural poverty, strengthening food security, improving human health and nutrition, and ensuring more sustainable management of natural resources."	(CGIAR Consortium Office, 2013, p.1)

Appendix Two: Template participant information sheet and consent form



PARTICIPANT INFORMATION SHEET

Study Title: Contested Framings of Agricultural Research for Development

Researcher: Ruth Segal, Doctoral Researcher, Science Policy Research Unit (SPRU) in the School of Business, Management and Economics.

You are being invited to take part in a PhD research study examining the role of international public agricultural research in helping to reduce hunger and poverty. Before you decide whether or not to take part, it is important for you to understand why the research is being done and what it will involve. Please read the following information carefully.

It is up to you to decide whether or not to take part. If you do decide to take part you will be given this information sheet to keep and will be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason.

This research study, entitled ‘**Contested Framings of Agricultural Research for Development**’ is being conducted for the completion of a PhD at the University of Sussex, UK, funded by the Economic and Social Research Council (ESRC). It is expected that the PhD research will be completed and submitted by December 2016.

The research aims to explore the changing role of publicly-funded international agricultural research (IAR) in the context of a new policy and institutional environment in relation to the functioning of the global agri-food system, particularly since the global food price crisis of 2007/8.

The research will examine the changing role of agricultural research in addressing hunger and poverty through an examination of CGIAR (Consultative Group on International Agricultural Research), its role as provider of ‘International Public Goods’ (IPGs) and the evolution of key policies relating to that role through its recent (2008-11) reform process. Data collection will be primarily through a desk-based archival search of publicly-available internal CGIAR documents. This documentary research will be complemented by interviews with key informants.

You have been identified as a potential participant for this research study because of your knowledge of international agricultural research and the CGIAR system.

The study will involve around 20 participants, who will all be interviewed separately. If you choose to take part, you will be interviewed at a time and place convenient to you.

Questions will cover topics such as the evolution of policies on IPGs, intellectual property and plant genetic resources in historical context and during the 2008 reform process; actors and stakeholders involved in the reform process, and their relative influence; external influences on CGIAR, such as donor policies and civil society perspectives; and the wider context within which these policies were developed.

The interview will be audio recorded and then transcribed onto a computer. The recordings and transcriptions will be stored in a secure place at all times. Your response will be treated with full confidentiality, and you will be able to choose whether to remain anonymous in the study. If anonymity is not possible because of your prominent institutional position, you will be informed, and the transcript will not be used if you so wish. You can request a copy of the interview transcript if you wish.

The information gained from this research will be used to write a PhD thesis, and may be used in future publications such as peer reviewed journals and conference presentations. You will have the right to access the thesis and any publications generated from the data collected during the interview process.

The research has been approved by the Social Sciences & Arts Cross-Schools Research Ethics Committee (C-REC) at the University of Sussex, UK.

If you would like any further information regarding this research, please contact me at R.Segal@sussex.ac.uk or on 07809 682018. If you have any concerns about the way in which the research study has been conducted please contact my supervisor, Professor Erik Millstone, by e-mail at e.p.millstone@sussex.ac.uk.

Thank you for taking the time to read this information sheet.

Date: 20th January 2016



CONSENT FORM FOR PROJECT PARTICIPANTS

Project Title: **Contested Framings of Agricultural Research for Development**

Project Approval

Reference: **ER/RS372/2**

I agree to take part in the above University of Sussex research project. I have had the project explained to me and I have read and understood the Information Sheet, which I may keep for my records. I understand that agreeing to take part means that I am willing to:

- Be interviewed by the researcher
- Allow the interview to be audio recorded
- Make myself available for a further interview should that be required

I understand that my participation is voluntary, that I can choose not to participate in part or all of the project, and that I can withdraw at any stage of the project without being penalised or disadvantaged in any way.

I consent to the processing of my personal information for the purposes of this research study. I understand that such information will be treated as strictly confidential and handled in accordance with the Data Protection Act 1998.

EITHER (please delete as applicable)

I understand that I have given my approval for my name and/or the name of my workplace to be used in the final report of the project, and in further publications.

OR

I understand that any information I provide is confidential, and that no information that I disclose will lead to the identification of any individual in the reports on the project, either by the researcher or by any other party.

Name:

Signature

Date:

Appendix Three: List of interviewees

Code	Name	Details	Date of Interview	Location of Interview	How to use
I1	Norman Clark	External observer / adviser to CGIAR	27.10.14	Brighton	Informal meeting, for background only
I2/1	Asked to remain anonymous	Centre staff member	6.3.15	Skype	Anonymous but use as required
I3	Andrew Ward	CGIAR staff member	11.3.15	Skype	Transcript shared. Can name and quote.
I4	Patrick Mulvany	External observer / former member of NGOC	20.3.15	Phone	Permission required for any verbatim quotes, otherwise send any relevant sections.
I5	Maggie Gill	Member of CGIAR's Independent Science and Partnership Council (ISPC)	8.5.15	Skype	Can name. Would like to see specific quotes before attributed
I6	Asked to remain anonymous	Donor	12.5.15	London	Can use quotes but do not attribute directly. Send any quotes before using them.
I7	Asked to remain anonymous	Centre board member	12.2.16	University of Sussex	Requested confidentiality and no quoting
I8	Douglas Gollin	Member of CGIAR's Standing Panel on Impact Assessment (SPIA)	15.3.16	Skype	Can name and quote
I9	Sara Boettiger	Donor (BMGF)	19.4.16	Phone	Permission required for any verbatim quotes, check on organisational attribution
I10	Asked to remain anonymous	Partner	19.5.16	Skype	Requested confidentiality
I11	Asked to remain anonymous	Centre staff member	20.5.16	Phone	Requested confidentiality, can use quotes if not attributed, would

					like to see paragraphs where quoted
I12	Robin Bourgeois	Partner - GFAR: Senior Foresight and Development Policies Expert	3.6.16	Skype	Can be named and quoted
I13	Asked to remain anonymous	Centre Board member	17.6.16	Skype	Requested confidentiality, can use quotes if not attributed
I14	Asked to remain anonymous	Donor	13.7.16	Skype	Requested confidentiality
I15/1	Neth Daño	NGO (Co-Exec Director of ETC Group)	9.9.16	University of Sussex	Can be named and quoted
I15/2	Neth Daño	NGO (Co-Exec Director of ETC Group)	11.10.16	Skype	Can be named and quoted
I16/1	Francesca Re Manning	Centre staff member	27.9.16	Skype	Can be named and quoted
I16/2	Francesca Re Manning	Centre staff member	27.9.16	Skype	Can be named and quoted
I2/2	Asked to remain anonymous	Centre staff member	30.9.16	University of Sussex	Requested confidentiality

Appendix Four: Mandate crops

A number of historical documents (from mid-1990s to mid-2000s) use the phrase "CGIAR mandate crops", indicating 22 crops which were the subject of the 1994 agreements between FAO and CGIAR Centres, placing materials in Centre genebanks under the auspices of FAO. However, there is no definitive list of these crops. This is because agreements were between FAO and individual Centres and each Centre could choose which crops were covered by the Agreement.

'Mandate' crops and their relatives were prioritised for inclusion in genebank collections, and for research, with Centres having a core focus on a limited number of crops. However, as Centres moved towards working on ecosystems (which may involve a range of species) rather than individual crops, the concept became less relevant to Centres' work (Sirkka Immonen, pers. comm. 24.9.15). Nonetheless, it is still current, with ICRISAT's Board agreeing to add finger millet to its list of mandate crops in 2015 (ICRISAT, 2015).

Different bodies involved in PGR conservation and genebank management have developed their own lists of crops to prioritise. The International Treaty on Plant Genetic Resources for Food and Agriculture (the Seed Treaty) applies to 35 food crops and 29 forage crops.

The Crop Trust focuses on only 25 of these (and their wild relatives).

Genesys, an online portal for accessing and ordering PGR, established in 2008 by Bioversity International (on behalf of CGIAR), the Crop Trust and the Secretariat of the Seed Treaty, provides free access for researchers and breeders to a list of crops, overlapping with, but not exactly replicating, the crops covered in Annex 1 of the Seed Treaty (Genesys, 2019).

CGIAR 1987 list	CGIAR 2000 list	The Seed Treaty Annex 1	The Crop Trust (on 10.5.19)	Genesys (on 10.5.19)
		Apple		Apple
		Asparagus		
			Agroforestry trees	
	Andean root and tuber crops*		Andean roots and tubers	
		Aroids	Aroids (e.g. Taro)	
Bambara groundnut	Bambara groundnut*		Bambara groundnut	Bambara groundnut
	Banana/plantain	Banana/ plantain	Banana	Banana
Barley	Barley	Barley	Barley	Barley
	Beans	Beans	Beans	Beans
		Beet		
		Brassica complex		
		Breadfruit		
Bread wheat				
		Carrot		Carrot
Cassava	Cassava	Cassava	Cassava	Cassava
Chickpea	Chickpea	Chickpea	Chickpea	Chickpea
		Citrus		
	Coconut*	Coconut	Coconut	
Cowpea	Cowpea	Cowpea et al.	Cowpea	Cowpea
	Date palm*			

Durum wheat				
		Eggplant		Eggplant
Faba	Faba bean	Faba bean / vetch	Faba bean	Faba bean
Forages	Forage crops	Forage crops (listed separately)	Forages	Forages
		Finger millet		
	Grass pea	Grass pea	Grass pea	Grass pea
Groundnut	Groundnut		Groundnut	Groundnut
Lentils	Lentil	Lentil	Lentil	Lentil
				Lettuce
Maize	Maize	Maize	Maize	Maize
Millet	Millet (pearl and finger)	Millet (pearl)	Millet	Millet (pearl)
		Oat		Oat
	Pea*	Pea	Pea	
Pigeonpea	Pigeonpea	Pigeonpea	Pigeonpea	Pigeonpea
Potato	Potato	Potato	Potato	Potato
	Quinoa*			
Rice	Rice	Rice	Rice	Rice
	Rye	Rye		
Sorghum	Sorghum	Sorghum	Sorghum	Sorghum
Soy bean	Soy bean			Soy bean
		Strawberry		
		Sunflower		Sunflower
Sweet potato	Sweet potato	Sweet potato	Sweet potato	Sweet potato
	Taro*			
				Tomato
Triticale	Triticale	Triticale		
	Wheat	Wheat	Wheat	Wheat
Yam	Yam	Yam	Yam	Yam
	*Conservation and research work (not genetic improvement work)			

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<https://hdl.handle.net/10947/915>

CGIAR CDC (2000) *CDC Statement on the Multilateral System Currently under Consideration in the Re-negotiation of the FAO International Undertaking on Plant Genetic Resources*
<https://hdl.handle.net/10947/222>

Crop Trust (2019) <https://www.croptrust.org/our-work/interactive-map/> accessed on 10.5.19

Genesys (2019) <https://www.genesys-pgr.org/explore> accessed on 10.5.19

ICRISAT (2015) Finger millet formalized as a mandate crop in ICRISAT's research portfolio, *ICRISAT Happenings*, In-House Newsletter no. 1695, 1 October 2015 <http://www.icrisat.org/newsroom/latest-news/happenings/happenings1695.htm#1>