

Understanding access to seeds and plant genetic resources

What can a livelihoods perspective offer?



Shaila Seshia with Ian Scoones
Environment Group
Institute of Development Studies
University of Sussex
UK

November 2003



FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

Livelihood Support Programme (LSP)

An inter-departmental programme for improving support for enhancing livelihoods of the rural poor.

Understanding access to seeds and plant genetic resources

What can a livelihoods perspective offer?

Shaila Seshia with Ian Scoones
Environment Group
Institute of Development Studies
University of Sussex
UK

November 2003

This paper was prepared under contract with the Food and Agriculture Organization of the United Nations (FAO). The positions and opinions presented are those of the authors alone, and are not intended to represent the views of FAO.

The Livelihood Support Programme

The Livelihood Support Programme (LSP) evolved from the belief that FAO could have a greater impact on reducing poverty and food insecurity, if its wealth of talent and experience were integrated into a more flexible and demand-responsive team approach.

The LSP, which is executed by FAO with funding provided by DfID, works through teams of FAO staff members who are attracted to specific themes being worked on in a sustainable livelihoods context. These cross-departmental and cross-disciplinary teams act to integrate sustainable livelihoods principles in FAO's work, at headquarters and in the field. These approaches build on experiences within FAO and other development agencies.

The programme is functioning as a testing ground for both team approaches and sustainable livelihoods principles.

Email: lsp@fao.org

Access to natural resources sub-programme

Access by the poor to natural resources (land, forests, water, fisheries, pastures, etc.), is essential for sustainable poverty reduction. The livelihoods of rural people without access, or with very limited access to natural resources are vulnerable because they have difficulty in obtaining food, accumulating other assets, and recuperating after natural or market shocks or misfortunes.

The main goal of this sub-programme is to build stakeholder capacity to improve poor people's access to natural resources through the application of sustainable livelihood approaches. The sub-programme is working in the following thematic areas:

1. *Sustainable livelihood approaches in the context of access to different natural resources*
2. *Access to natural resources and making rights real*
3. *Livelihoods and access to natural resources in a rapidly changing world*

This paper contributes to the first thematic area by using a livelihoods perspective to facilitate understanding of the role played by seeds and plant genetic resources in rural people's livelihoods. It shows how a livelihood perspective may strengthen understanding of issues of access to seeds and plant genetic resources.

TABLE OF CONTENTS

SUMMARY	v
1. INTRODUCTION.....	1
1.1. Introduction: Understanding access to seeds and PGRs	1
1.2. Using a livelihoods perspective	2
1.3. Contributions to FAO's objectives	3
1.4. Organization of the paper.....	3
2. SUSTAINABLE LIVELIHOODS – WHAT CAN IT OFFER?	4
2.1. Introduction.....	4
2.2. Key principles and frameworks	5
2.3. Looking at seeds and PGRs through a sustainable livelihoods lens	7
2.4. Summary	11
3. CONTRIBUTION OF SEEDS AND PLANT GENETIC RESOURCES TO SUSTAINABLE LIVELIHOODS	12
3.1. Introduction.....	12
3.2. Managing uncertainties	12
3.3. Maximising productive assets and strengthening the asset base.....	13
3.4. Visible and hidden contributions of seeds and PGRs to livelihood strategies.....	14
3.5. Summary	16
4. UNDERSTANDING ACCESS: HOW A SUSTAINABLE LIVELIHOODS PERSPECTIVE CAN INFORM WORK ON SEEDS/PGRS	18
4.1. Introduction.....	18
4.2. Case 1: Seed provision in emergencies.....	20
4.3. Case 2: Wild and weedy resources and local crops	24
4.4. Case 3: Engaging with research: farmers' access to Plant Genetic Resources	27
4.5. Summary	30
5. FUTURE DIRECTIONS: DEVELOPING A FRAMEWORK FOR ACCESS TO SEEDS/PGRS.....	32
5.1. Introduction.....	32
5.2. A framework to assist efforts to strengthen access to seeds and PGRs	33
5.3. Next steps.....	36
5.4. Concluding comment	37
REFERENCES.....	38

List of Figures, Tables and Boxes

Figure 2.1: The IDS Sustainable Livelihoods framework

Figure 5.1: Strengthening access to seeds and PGRs: a framework to assist informed decisions and actions

Table 3.1: The contribution of seeds and plant genetic resources to livelihood security

Table 4.1: Seed security framework: basic parameters

Table 4.2: Overview of case studies

Box 2.1: Making and shaping access to seeds and PGRs: examples of institutions, organizations and policies

Box 3.1: The diverse seed needs of Kenyan farmers

Box 3.2: ‘Transport’ and migration in West Africa

Box 4.1: Inappropriate relief? Seed provision in Honduras after Hurricane Mitch

Box 4.2: War and the social fabric of seed systems in Sierra Leone

Box 4.3: New challenges for access: Kerala’s plant biodiversity registers

Box 4.4: Participatory development of new varieties of maize in Sol da Manhã

SUMMARY

Access to seeds and plant genetic resources (PGRs) is a vital element of food security and sustainable development. Most development interventions and activities around seeds and PGRs typically have a scientific and/or technical focus on production or conservation concerns. But scientific and technical efforts, while valuable and important, sometimes fail to consider questions of how seeds and PGRs fit into the bigger picture of people's livelihoods.

Forming one output of the Livelihood Support Programme's sub-programme 3.1, this study was commissioned out of recognition that the issue of access by poor households to seeds and PGRs is an area in which knowledge is lacking, and that a more holistic approach to seeds and PGRs work is needed to strengthen livelihoods. This study therefore fits within the broader remit of sub-programme 3.1 to improve access to natural assets by the poor and, more broadly, within the FAO's strategic objectives to promote sustainable rural livelihoods and more equitable access to resources.

This study uses a livelihoods perspective to facilitate understanding of the role played by seeds and PGRs in rural people's livelihoods and considers how a livelihood perspective may strengthen understanding of issues of access. A sustainable livelihoods perspective offers a way of thinking about the linkages among vulnerability, poverty and environmental or natural resource management. It is grounded and contextual, looking at how different people pursue a range and combination of livelihood strategies given a particular vulnerability context, combination of assets and set of opportunities and constraints presented by institutional structures and processes.

Livelihoods perspectives demonstrate how seeds and PGRs are key assets that are linked to other livelihood resources and strategies in complex ways. This study maps out some of the ways that seeds and PGRs contribute to livelihood security, going beyond their direct contributions to food and income to consider more dynamic and less visible ways in which they enable households to manage various forms of uncertainty and risk, maximise use of other productive assets, and facilitate diverse livelihood strategies. A livelihoods approach is therefore a complement to conventional seeds/PGR interventions, but one that requires a different outlook. It encompasses more than just technical or genetic approaches, but also draws on social, political, economic, and institutional perspectives.

For these contributions to be realised, and goals of food and livelihood security to be met, access to seeds and PGRs is key. The processes through which access is secured are often, however, poorly understood or under-appreciated, leading to the entrenchment of false assumptions about access, to the neglect of important access routes, and to a limited understanding of the factors that influence and the forces that bear on access. A livelihoods perspective focuses attention on access, and enables us to unpack what it means in different contexts and for different groups of people.

A central argument of this study is that the value-added of a livelihoods approach lies in its attention to the importance of access to resources and to the institutions, both formal and informal, that shape and mediate such access. These institutions operate at

multiple levels, and range from local networks and social arrangements to national and international rules and regulations. Rural people may gain access to seeds/PGRs through a number of mechanisms or channels, each of which is affected by a range of institutions and is predicated on particular contextual factors.

Given the complexity and contextual nature of access questions, three cases are used. The case studies are: emergency seed relief, wild and weedy foods, and farmer engagement with agricultural research systems. These case studies were selected deliberately to demonstrate that the issues and questions of access vary across contexts. Each case suggests how a livelihoods approach can help highlight the range of institutions and policies, as well as the links with other assets, that are important in shaping access to seeds and/or plant genetic resources. Together, the case studies demonstrate: the assumptions made about access/lack of access; neglected channels through which people access seeds and PGRs; links with other livelihood resources; and the way that local questions of access are 'connected up' to institutions and processes at national and international levels.

Seeing, not to mention trying to understand, the bigger picture in which seeds and PGRs connect with livelihoods, is not always straightforward. The final section of the study, drawing on analysis in the preceding sections, offers a framework and checklist of questions to facilitate thinking about access to seeds and PGRs and appropriate entry points. After identifying further steps that may be taken to improve understanding of issues around access to seeds and PGRs, the study concludes with a call for the development of new kinds of thought and practice to better understand how seeds and PGRs are located within livelihood systems and to enable locally grounded work that spans institutional scales.

1. INTRODUCTION

This section offers an outline of the key arguments of the paper. These are that:

- A technical focus on seeds and PGRs is important, but insufficient.
- Understandings of seeds/PGRs must be set within a wider view of seed systems and livelihoods.
- Livelihood perspectives view seeds/PGRs as key livelihood assets, linked to other livelihood resources in complex ways.
- An appreciation of livelihood complexity and diversity is required to strengthen seed/PGR interventions. A more differentiated approach - looking at varied impacts on different types of household/individual by wealth, age, gender etc. is important.
- A livelihoods perspective also highlights the importance of access to the resource, and the institutions that mediate this.
- An institutional analysis points to how institutions operate at multiple levels - from local networks and social arrangements to international rules and regulations.
- Again, understanding this institutional complexity is key to addressing issues of access to seeds and PGRs, and to improving the contributions of seed/PGR interventions to broader goals of food and livelihood security and sustainable development.

The paper proceeds to show how seeds/PGRs interact with a) local livelihood complexity and b) institutional complexity. These interactions are illustrated through a series of case studies looking at how issues of access to seed/PGRs emerge in different contexts. From this, a simple framework is developed to facilitate exploration of seed-livelihood dynamics.

1.1. Introduction: understanding access to seeds and PGRs

Access to seeds and plant genetic resources (PGRs) is a vital element of food security and sustainable development. Most development interventions and activities around seeds and PGRs typically have a scientific and/or technical focus on production or conservation concerns. Some common examples of these activities are: crop and varietal improvement projects; the development of technical capacity and infrastructure; genebank standards; duplication and exchange policies; and guidelines on in situ conservation.¹ But scientific and technical efforts, while valuable and important, sometimes fail to consider questions of how seeds and PGRs fit into the bigger picture of people's livelihoods.

The significance of seeds and PGRs cannot be fully appreciated only in scientific or technical terms, or through a production or conservation-focused lens – for in many ways, 'seed is everything.'² Seeds are vehicles for plant genetic resources, stores of valuable genetic information and traits, and expressions of biodiversity. Plant genetic diversity, embodied in seeds, enables adaptation to changing economic and environmental conditions and supports diverse livelihoods in obvious and not-so-obvious ways. Seeds are important in local systems of informal exchange as well as wider social relations; at the same time, they are also increasingly prominent in global trade and commerce. Seeds often occupy a central place in cultural beliefs, practices

¹ See: www.fao.org/ag/AGP/AGPS

² Dr. Arturo J. Martínez, Chief, Seed and Plant Genetic Resources Service, Plant Production and Protection Division, Agriculture Department, Food and Agriculture Organization of the United Nations, 16 October 2003.

and rituals; equally, they are routinely used as a political tool. Their contributions to livelihoods, therefore, are multi-faceted.

Moreover, the bigger picture within which issues around access to seeds and PGRs connect with livelihood concerns is complex and fast-changing. Some notable features or trends are:

- the growth of the private sector through the rise, often as a result of mergers and acquisitions, of multinational seed houses, the agricultural biotechnology and life sciences industry;
- increasing proprietary control of plant genetic resources and seed material;
- declining capacity of the public sector in developing countries to develop new varieties and distribute seed;
- the expansion of trade rules governing the import/export of seed and PGRs which affects the flow of seeds and genetic material;
- the growing use of seed as a component of emergency relief efforts across the world;
- emerging global governance of seeds and PGRs established through a plethora of international agreements, such as the Convention on Biological Diversity (CBD), Cartagena Protocol, and International Treaty on Plant Genetic Resources for Food and Agriculture.

These trends and others affect the relationships between seeds and PGRs and livelihoods at local levels, and in particular raise questions about access. Attention to this bigger picture and an appreciation of livelihood complexity and diversity are critical if seed and PGR interventions are to make effective contributions to reducing poverty and improving food and livelihood security.

1.2. Using a livelihoods perspective

This study seeks to facilitate understanding of the role played by seeds and PGRs in rural people's livelihoods and considers how a livelihood perspective may strengthen understanding of issues of access. Livelihood perspectives demonstrate how seeds and PGRs are key assets that are linked to other livelihood resources and strategies in complex ways. Briefly, a livelihoods perspective offers insight into:

- The contribution of seeds and PGRs to people's livelihood strategies and systems.
- The different routes through which access to seed and PGRs may be secured.
- The opportunities and constraints people face in gaining access to seeds and PGRs.
- The way access is differentiated by wealth or socio-economic group, but also by other factors such as gender and age.
- The entry points that may enhance people's livelihood resilience.

The use of a livelihoods approach is compatible with other approaches to rural development, including ecosystems approaches, people-centred development, farming systems and participatory methods. All of these different approaches offer insights into the links between seeds and PGRs and livelihoods, and indeed can inform a livelihoods perspective.

We argue that the value-added of a livelihoods approach lies in its attention to the importance of access to resources and to the institutions, both formal and informal, that shape and mediate such access. Issues around access to seeds and PGRs are usually neglected by interventions that tend to concentrate on availability, supply and distribution of seeds. Institutional analysis draws attention to how institutions affect people's access to and command of a range of assets, including seeds and PGRs. These institutions operate at multiple levels, and range from local networks and social arrangements to national and international rules and regulations. Understanding access to seeds and PGRs using an institutional lens suggested by a livelihoods approach is therefore an important element of this study.

1.3. Contributions to FAO's objectives

The study contributes and is of direct relevance to a number of the FAO's strategic objectives (FAO, 2000a). For example:

- A.1 'Sustainable rural livelihoods and more equitable access to resources'
- A.2 'Access of vulnerable and disadvantaged groups to sufficient, safe and nutritionally adequate food'.
- A.3 'Preparedness for, and effective and sustainable responses to, food and agricultural emergencies'
- B. 'Ensuring enabling policy and regulatory frameworks for food, agriculture, fisheries and forestry'
- C.1 Policy options and institutional measures to improve efficiency and adaptability in production, processing and marketing systems'
- D.1 'Integrated management of land, water, fisheries, forest and genetic resources'.

Forming one output of the Livelihood Support Programme's sub-programme 3.1, this study was commissioned out of recognition that the issue of access by poor households to seeds and PGRs is an area in which knowledge is lacking, and that a more holistic approach to seeds and PGRs work is needed to strengthen livelihoods. This study therefore fits within the broader remit of sub-programme 3.1 to improve access to natural assets by the poor.

1.4. Organization of the paper

The study is organised as follows. The subsequent section provides a brief overview of the livelihoods approach, and suggests broadly why it is useful in the context of this study. Section three reviews the contribution of seeds and PGRs to people's livelihoods. The fourth section considers how a livelihoods perspective can inform understanding about issues of access to seeds and PGRs. Three sub-sections focus on particular areas of activity where a livelihoods perspective may strengthen current work; these areas are: seed relief during emergencies; wild and weedy resources; and farmer engagement with agricultural research systems. The final section draws together some of the findings from the review and identifies knowledge gaps, offers a framework to facilitate a more holistic understanding of access to seeds and PGRs, and raises issues and questions for further exploration.

2. SUSTAINABLE LIVELIHOODS – WHAT CAN IT OFFER?

This section offers a brief overview of the key elements of a sustainable livelihoods approach. It shows how the following elements are important:

- Understanding context: agro-ecological, climate, macro-economic factors, politics/conflict etc.
- Looking at how different people make use of different livelihood resources (or capitals), with seeds/PGRs being an important resource.
- How such resources are combined to follow different livelihood strategies (including agriculture): agricultural intensification/extensification, livelihood diversification (non-agricultural), migration.
- How institutions and policies mediate access to such resources (including seeds/PGRs), and how these can operate across multiple levels from the micro to the macro.
- How, given particular contexts, access to livelihood resources, institutional/policy processes and choices of strategies, different livelihood outcomes will result.
- Improving livelihood sustainability is not straightforward - the provision of seeds/PGRs may be one part of the jigsaw, but there are many others.
- Seeing this bigger, complex picture allows for the identification of new entry points for interventions, and more effective design of such interventions.

A livelihoods approach is therefore a complement to conventional seeds/PGR interventions, but one that requires a different outlook. It encompasses more than just technical/genetic approaches, but also the social, political, economic, institutional perspectives. An integrated, cross-sectoral, multi-disciplinary approach is therefore needed.

2.1. Introduction

A sustainable livelihoods perspective offers a way of thinking about the linkages among vulnerability, poverty and environmental or natural resource management. It is grounded and contextual, looking at how different people pursue a range and combination of livelihood strategies given a particular vulnerability context, combination of assets and set of opportunities and constraints presented by institutional structures and processes. Emerging out of more participatory approaches to development, it draws inspiration from diverse work on vulnerability and assets (Swift, 1989); well-being, capabilities and entitlements (Sen, 1981; Drèze and Sen, 1989; Leach *et al.*, 1997.); notions of capital, such as human and social capital; and institutions (Giddens, 1979; North, 1990; Mehta *et al.*, 1999).

Poverty reduction and alleviation remain central to livelihoods perspectives and efforts to reduce poverty focus on strengthening people's command of assets, expanding their opportunities to pursue different livelihoods strategies, and enhancing resilience in the face of risk, stresses and shocks. In this sense, livelihoods approaches go beyond – though they by no means preclude – poverty reduction efforts that focus on enhancing income.

Underpinning the livelihoods approach is a very different way of thinking about poverty. More conventional approaches to poverty reduction have tended to focus on poverty lines, headcounts, or other measures based on income and/or consumption criteria (Farrington, *et al.*, 1999). A livelihoods approach, in contrast is less focused on needs but more on assets and capabilities. The focus is on people: what they are

able to do with the resources they have, the varied opportunities and obstacles they face and the outcomes they are able to achieve. This more dynamic and people-centred approach is reflected in a widely accepted definition of sustainable livelihoods

‘A livelihood comprises capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets, both now and in the future, while not undermining the natural resource base.’(Chambers and Conway, 1992)

Sustainable livelihoods may be thought of as an approach to development that is people-centred and inter-disciplinary; as an objective based on a commitment to poverty elimination, strengthening local capacity and achieving sustainability; and as a framework to facilitate understanding of complex and dynamic livelihood systems (see Baumann, 2002). Since the mid-1990s, sustainable livelihoods approaches have been adopted by a range of organizations – including the Department for International Development (DfID), the United Nations Development Program (UNDP), CARE and Oxfam -- as a way of thinking more holistically about poverty reduction. A number of livelihood frameworks have been developed by these organizations as a tool to help make sense of the complexities of diverse livelihood systems (see Cotula, 2002). To some extent, variations among the framework reflect the particular agendas and priorities of these different organizations (or elements within them). The range of frameworks provides an indication of the flexibility in application that exists within a broader SL perspective.

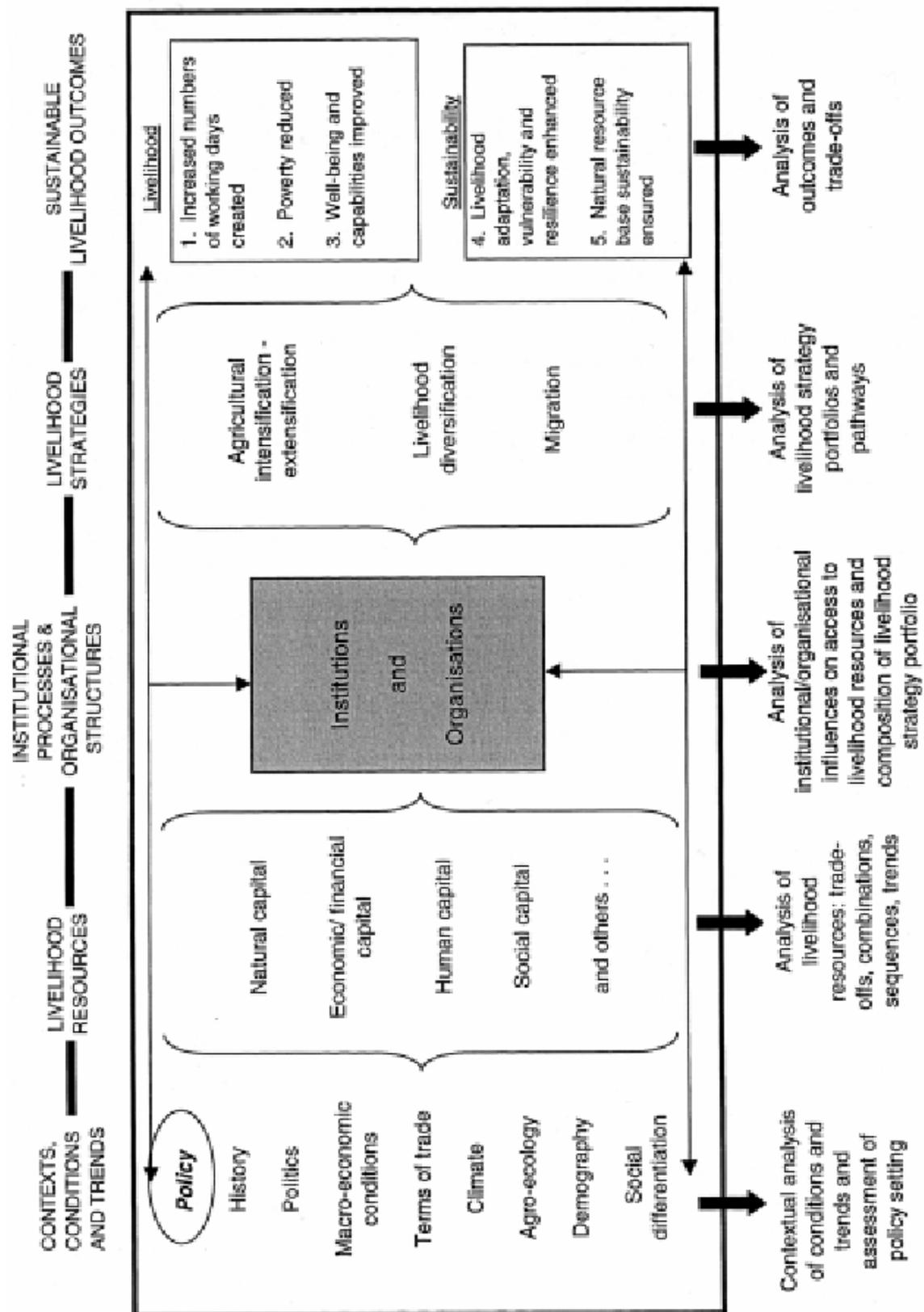
2.2. Key principles and frameworks

Despite the differences among approaches or frameworks, a sustainable livelihoods perspective has several key elements:

- it is people-centred, emphasising the decisions people make and actions they take with the resources that they have
- it encompasses a broad range of assets and strategies which people draw on and pursue
- its analysis is multi-level and it looks at the way in which local, national and global are linked
- it is dynamic, focused on the assets and strategies people use to negotiate within and among different institutional arrangements and in changing, and often uncertain, environments. (FAO, 2000b; Moser and Norton, 2001; Scoones, 1998; DfID, 1998).

It is important to emphasise that a livelihoods approach or framework may be adopted and adapted to suit the needs of a particular context. This paper is broadly informed by, but does not rigorously apply, the approach developed at the Institute of Development Studies (Scoones, 1998). The framework is offered not as a ‘magic bullet’, but as a structured checklist to help develop questions in order to better understand complex relationships.

Figure 2.1: The IDS Sustainable Livelihoods Framework



Source: Scoones, 1998

2.3. Looking at seeds and PGRs through a sustainable livelihoods lens

A sustainable livelihoods perspective is useful for looking at both the contribution of seeds to sustainable livelihoods and for enabling understanding of issues of access. Sections III and IV will address these topics in more depth. In brief, however, looking at seeds and PGRs through a sustainable livelihoods lens highlights:

- The broader role and significance of seeds and PGRs in people's livelihood systems. From a livelihoods perspective, seeds and PGRs are regarded as one among a range of assets that people may possess. They enable adaptation to particular and changing contexts and conditions, contribute to building and maximising other productive assets, enable the pursuit of different livelihood strategies, and facilitate the realization of positive livelihood outcomes.
- An SL perspective enables us to unpack what access to seeds and PGRs means in different settings for different groups of people. Simple availability of seeds and PGRs is not sufficient to achieve the contributions to livelihoods. Rather, access to seeds and PGRs is vital. Disaggregating access requires looking at the linkages and interactions among assets, institutions and policies in these different contexts. A livelihoods perspective focuses on the institutions and policies that shape access to seeds and PGRs.

Drawing on the discussion and framework above, this section provides an overview of the key elements of a sustainable livelihoods approach with particular reference to seeds/PGRs.

Contexts and conditions

Contexts and conditions, also referred to as the vulnerability context, consist of characteristics or events in the external environment that shape people's livelihood systems. The framework identifies a number of factors, including climate, agro-ecology, macro-economic conditions and terms of trade. Social differentiation is also an integral contextual factor. Social factors that differentiate people – such as gender, age, class, caste, and ethnicity – are important in understanding people's access to and command of assets, the strategies that are open to them and the opportunities and constraints they face in pursuing these strategies.

When looking at access to natural resources generally, these contextual factors are sometimes disaggregated as shocks, trends and seasonal factors (Baumann, 2002; DfID, 1998).

- shocks may be natural (floods, droughts), economic (economic crises) or political (conflict).
- trends are more on-going processes of change, and may be economic, demographic, technological, or climatic.
- seasonality refers to trends that have a seasonal dimension, including market prices, employment opportunities and food availability.

Differentiating contextual factors in this way distinguishes different degrees of predictability (Baumann, 2002). While shocks are characterised by great uncertainty

and generally consist of events over which people have little control, trends and seasonality may be more predictable and allow for the development of strategies and responses to them. Understanding the degree and nature of uncertainty that exists around different contextual factors is therefore an important consideration when developing appropriate entry points.

Livelihood assets: human, natural, social, physical and financial 'capital'

Sustainable livelihood approaches draw on the economic concept of capital to refer to the range of productive resources or assets which people command. The elaboration of different livelihood capitals endows the sustainable livelihoods approach with its holism and multi-disciplinarity. These capitals are identified and defined as:

- natural capital: natural resource assets (land, soil, water, air) and environmental services (nutrient cycling, hydrological cycle)
- financial capital: cash, credit, savings/debt and other economic assets
- human capital: skills, knowledge, good health and physical ability to labour
- social capital: social resources such as networks, social relations, claims, and associations
- physical capital: the basic infrastructure such as transport, production equipment, storage facilities, livestock, agro-chemical inputs, technology

Seeds and plant genetic resources are an important asset in rural livelihoods, but do not fit neatly within the classification above. Rather, they embody elements of natural, physical and human capital. While seeds and plant genetic resources are often regarded as natural capital, on-going processes of seed selection and plant breeding and management – whether in formal or informal seed systems – mean that they also, in part, embody the application of human knowledge and skills. Technology-intensive methods of developing new varieties, some may argue, mean that certain seeds represent physical capital. The conceptual debate about how seeds and plant genetic resources should be defined and classified is beyond the bounds of this paper. For the purposes of this paper, the important point is that seeds and PGRs combine several kinds of capital.

More relevant for this analysis is how different assets are linked and how certain combinations of assets produce portfolios that in turn affect the pursuit of different livelihood strategies. Understanding assets, therefore, requires attention to these interactions and the ways in which they may be clustered, sequenced or substituted to enable different livelihood strategies (Scoones, 1998)

Livelihood strategies

Given a particular asset profile and set of opportunities and constraints, people may pursue a range and combination of livelihood strategies:

- Agricultural or natural-resource based: agricultural intensification focuses on increasing the output per unit area through increasing inputs; extensification may refer to increasing the land under cultivation or use of uncultivated land, such as wild areas and common land.
- Diversification: engaging in a range of non-agricultural or non-natural resource based activities through, for example, off-farm income earning.

- Migration: this may be voluntary or involuntary.

It is important to note, of course, that more often than not these strategies are pursued in combination or sequence. Recent work in southern Africa, for example, emphasises that the pursuit of diverse strategies is an important and well-established part of rural livelihoods. Scoones and Wolmer (2003) argue that ‘most farmers in Africa are part-time, combining agriculture with other livelihood activities, including a range of off-farm work both locally and further afield... This has been a pattern since the colonial era, and circular migration, with remittance flows financing local investment and asset accumulation through the demographic cycle, has been a key facet of rural livelihood strategies for the best part of the last century.’ Seeds and PGRs, then, mean different things to different people depending on the type and combination of livelihood strategies being pursued. Interventions must take on board this type of understanding.

Institutions and policies

Institutions, organizations and policies play a crucial role in the ‘social life of seeds’ (Longley, 2000). This ‘life’ is shaped by the relations and networks among people, linking a range of actors and organizations including farmers, agricultural extension workers, state or international agricultural research systems, domestic and multinational corporations. The interaction and interplay of these actors is importantly constituted by institutions, which span local, national and international levels; these institutions may range from informal systems of gift-giving, exchange or loans to more formal institutions such as the market, extension systems, tenure regimes and regulatory frameworks.

Institutions and policies exert their influence on livelihoods in many ways: they shape contextual factors and conditions, are important in determining access to livelihood capitals and affect livelihood strategies through structuring opportunities and constraints. Institutions may be defined as ‘regularised patterns of behaviour that emerge, in effect, from underlying structures or sets of ‘rules in use’...and are maintained by people’s practices, or indeed their active ‘investment’ in those institutions’ (Leach et al., 1997). A livelihoods understanding of institutions encompasses both formal and informal institutions. The former includes regulatory frameworks and policies at different levels, but also institutions such as the market; examples of informal institutions would include local systems of exchange.

In a livelihoods perspective, institutions are not the same as organizations – one can distinguish them by noting that if institutions are sets of rules or practices, organizations represent the players or actors (Leach et al., 1997). In the context of seeds and PGRs, some of the key players include farmers and other rural people that rely on seeds and PGRs for their livelihoods, the public sector, private sector, and NGOs. The interactions among these actors are shaped and determined by institutions ranging from the market, public and private extension systems, contractual arrangements for seed multiplication, informal systems of seed exchange, gift-giving and labour-sharing and many others.

The box (2.1) below provides some examples of some of the institutions that are important in shaping and mediating access to seeds and plant genetic resources. While some of these institutions are well-established others are relatively new and emergent,

particularly in developing country contexts. All, however, are subject to change through, among other things, economic, political, and indeed social forces – this makes the institutional context in any given setting highly dynamic.

Box 2.1: Making and Shaping Access to Seeds and PGRs: Examples of Institutions, Organizations and Policies

Global level/trends:

- Agreement on Trade Related Aspects of Intellectual Property (TRIPs)
- International Treaty on Plant Genetic Resources for Food and Agriculture
- Convention on Biological Diversity
- Cartagena Protocol on Biosafety
- International Union for the Protection of New Varieties of Plants (UPOV)
- Public Sector: International Agricultural Research System
- Private Sector: growth of life sciences industry, mergers and acquisitions

National level:

- National legislation: IPRs, patents, benefit sharing, indigenous knowledge
- Regulatory frameworks: certification, varietal release, seed policy, competition policy
- NARs and extension service
- Property rights and tenure regimes, usufruct rights

Local Level:

- Informal local institutions for resource management (e.g. labour sharing, systems, exchange common land, informal customary institutions)
- Formally sanctioned community-based organizations
- Credit institutions

A livelihoods perspective therefore draws attention to institutions and policies that shape access across a range of scales from the micro to the macro. Rather than fixed systems, institutions are dynamic. They govern the interactions of diverse sets of actors, and create and shape the pathways that people negotiate to secure access to resources or pursue particular livelihood strategies. Institutional analysis involves attention to the politics of power and control that always underlie questions of access.

A livelihoods perspective helps identify how multiple and often overlapping institutions operate at many levels to shape local access to resources. While remaining locally grounded, sustainable livelihoods approaches consider how policies and institutions at international and national levels influence livelihood options locally. In this sense sustainable livelihoods perspectives offer a way of overcoming dichotomised thinking about ‘local vs. global’ by suggesting the ways in which they are interlinked. In practice, the emergence of global frameworks and agreements in the areas of intellectual property, access and benefit sharing and biosafety, as well as national regulatory frameworks on certification and release, have important implications for local access to seeds and PGRs.

2.4. Summary

In this changing context, the type of analysis enabled by a livelihoods perspective – starting at the micro-level ‘and looking upwards and outwards at broader institutional and policy arenas’ (Scoones and Wolmer, 2003) will become ever more important. This does not mean to say that more conventional technical interventions are less significant. A livelihoods perspective aims to situate such efforts in a broader understanding. This means that entry points must encompass not only more conventional technical domains but policy and institutional ones too, often in combination. If the big challenges of poverty reduction, creating sustainable livelihoods and so on – so often at the centre of development agencies mission statements – are to be realised, then a more holistic and with this sophisticated approach is needed. The remaining sections of this paper attempt to spell out what this might entail.

3. CONTRIBUTION OF SEEDS AND PLANT GENETIC RESOURCES TO SUSTAINABLE LIVELIHOODS

This section looks at how seeds/PGRs contribute to sustainable livelihoods in a variety of sometimes unexpected ways. Most emphasis has been on direct impacts (e.g. food/nutrition or income) but indirect or more hidden impacts on livelihoods may be just as important. It is difficult to make general links between certain 'types' of households (e.g. poor) and the kinds of seeds/PGR seeds they use (e.g. local landraces) in their farming systems (e.g. subsistence). Understanding seeds/PGRs as a part of a complex livelihood system is a key analytical starting point. It helps to us re-think some of these assumptions, and develop a more nuanced appreciation of the contribution seeds/PGRs make to livelihood security and sustainability.

The section proceeds to show, through a range of different examples, how seeds/PGRs make a range of contributions to sustainable livelihoods both through direct impacts but also, beyond that, contribute to livelihood systems and, ultimately, livelihood outcomes.

3.1. Introduction

The contribution of seeds and PGRs to sustainable livelihoods is vast, characterised not only by the diversity of species and varieties but also by the complexity of their interaction with other resources and livelihood strategies in equally diverse livelihood systems. The importance of seeds and PGRs is recognised both within the context of improving agricultural production and in efforts to conserve plant genetic diversity. Seeds are seen as material ripe for manipulation to enhance yield, adaptability, or nutritional value and as the stores of valuable genetic information. The plant genetic resources themselves are valued for their contribution to agro-ecological diversity and as essential inputs for the development of new products such as pharmaceuticals and seed varieties. The Global Plan of Action remarks that seeds and PGRs are 'the plant breeder's most important raw material and the farmers most essential input. They are also a reservoir of genetic adaptability to buffer against potentially harmful environmental and economic change.' (Global Plan of Action, 1996)

But seeds and PGRs have additional significance, beyond their productive and genetic value, as an important element of dynamic livelihood systems. Though vital to achieving livelihood security, the contribution made by seeds and PGRs, directly and indirectly, to diverse rural livelihoods tends to be overlooked. This section aims to map out some of these connections from a sustainable livelihoods perspective.

3.2. Managing uncertainties

Uncertainty and unpredictability, be they economic, political or environmental in nature, are endemic features of rural livelihoods: tenure may be insecure, rains may come late or fail all together, crops may be destroyed by pests or disease, and market prices fluctuate. These and other uncertainties are important makers of the risks, shocks and stresses that contribute to vulnerability. Vulnerability, however, is a matter of degree – the extent to which individuals and households are exposed and able to respond to these external events depends on their resilience. Strengthening resilience is an important livelihood outcome. Access to a diverse range of seeds and plant

genetic resources makes a positive contribution to this resilience as it assists in risk management and helps ameliorate some of the uncertainties outlined above.

For example, agro-climatic uncertainty is an important element of vulnerability in agricultural livelihoods. The use of photo-period sensitive varieties in Mali is one way in which farmers manage risk associated with variation in the year-to-year onset of rain. In Zimbabwe, where photo-period sensitive varieties are not used, late maturing varieties are planted if rains come early, and short duration varieties planted when rains come late. Farmers, however, will rarely plant only late-maturing varieties, because although the yields are better in good years the risk of crop failure is higher if rains finish earlier than normal (IPGRI Regional Office for Sub-Saharan Africa, 2002). This resilience in the face of agro-climatic uncertainty is made possible through a cropping strategy which relies on use of seeds with diverse characteristics. This strategy enables the risks associated with different kinds of crops or varieties, and the uncertainty created by climatic variation, to be managed effectively together.

3.3. Maximising productive assets and strengthening the asset base

The linkages between seeds and plant genetic resources and other livelihood resources are numerous and complex. Seeds can help people maximise and strengthen their asset base; at the same time, access to other assets such as physical or natural capital may be a condition for securing access to seeds. Substitution of certain resources for others can help individuals and households maximise their assets. Seeds play an important role in these decisions and processes. For example, use of nitrogen-fixing crops may substitute for, or reduce reliance on physical capital, such as expensive and high-input inorganic fertiliser (Scoones and Toulmin, 1999). Where the availability and productivity of labour is limited, particularly in areas hit by HIV/AIDS, the use of seeds and PGRs that require less labour-intensive cultivation and that can withstand weeds or bird attacks are important (IPGRI Regional Office for Sub-Saharan Africa, 2002).

Seeds and plant genetic resources also help maintain and strengthen a range of other assets. They are an essential basis of nutrition and food security, and so enhance human capital. Seeds may contribute to social capital, as they have cultural, spiritual and ritual significance and are often an important element in rural systems of gift-giving and exchange. Sale of seeds and produce helps build financial assets. Fodder for livestock and plant-based building materials help maintain and develop physical capital, and rely on plant genetic resources with characteristics that enable these uses. Seeds and PGRs contribute to biodiversity, and also strengthen natural assets by enabling processes of nutrient cycling, pest and disease control and pollination.

A range of capitals assets are important for the use and management of seeds and PGRs:

- Land, water, forests, common land (natural capital)
- Knowledge, education, labour, good health (human capital)
- Relationships, networks (social capital)
- Seed storage facilities, agro-chemical inputs, livestock, roads (physical capital)
- Cash, credit, access to markets (financial capital)

In some cases, access to seeds and plant genetic resources may be determined by whether an individual or household is able to command certain other capitals. We have noted that financial capital, suitable natural capital, and physical capital are important for using certain high-yielding varieties of seeds. Social capital is often more important in extensive informal seed systems and wields great influence over access to seeds. As we shall see in the case study on access to seeds in emergencies, the breakdown of social capital during conflict and other disasters causes enormous disruption to seed systems (Box 4.2).

The configuration of different assets will vary across households and individuals. Access to seeds and PGRs that are appropriate not only for agro-ecological conditions, but suited to the asset portfolios of different households is important for livelihood security (see Box 3.1 below).

Box 3.1: The Diverse Seed Needs of Kenyan Farmers

Poorer households in Embu District, Kenya, cannot meet food needs because of their small land holdings. Instead, they tend to specialise in the production of high value commodities that they trade for staple foods produced more cheaply elsewhere. A livelihoods study found that:

- Wealthier farms are relatively specialised enterprises that focus on staple food crops (mainly maize and beans) sold onto local markets. These farms can afford levels of technology (such as fertilizer) that maximise efficiency.
- Most medium-sized farms pursue a traditional strategy of food production for home-consumption, with occasional surpluses sold into the market. These farms struggle to compete with the 'technology-rich' farms, and are increasingly dependent on off-farm sources of income.
- Poorer farmers are unable to produce sufficient food for their own consumption because of their small landholdings. They are forced to take risks by diversifying into unconventional but high value agricultural products such as milk, flowers, French beans and snap peas. These goods are sold to middlemen who offer a better deal than the collapsing marketing parastatals. Most food needs are met through purchases from the local market, using cash obtained from the sale of high-value agricultural produce.

Source: Thorne and Tanner, 2001; in DfID2002

3.4. Visible and hidden contributions of seeds and PGRs to livelihood strategies

While agriculture continues to be the basis of rural livelihoods in developing countries, people in these areas pursue a range of other strategies to achieve livelihood security. Seeds and PGRs play a direct, but also sometimes a hidden, role in supporting these strategies. In some cases the contribution of seeds and plant genetic resources to livelihood strategies is obvious. They are, for example, often essential inputs to processes of agricultural intensification.

Diversification into non-agricultural activities and seasonal migration are important, but sometimes neglected, features of rural livelihoods and areas where access to seeds and plant genetic resources play an important, but less visible, role.

Box 3.2: 'Transport' and Migration in West Africa

Migration is an important livelihood strategy in many parts of rural Africa. In Burkina Faso, an early maturing rice variety called 'Transport' is used because it helps to finance farmers' travel to mines in northern Ghana and allows them to return in time to harvest late-maturing sorghums. Use of the variety thus facilitates seasonal migration and optimises the use of labour.

Source: IPGRI Regional Office for Sub-Saharan Africa, 2002

As is evident in the discussion above, seeds and PGRs make a range of contributions to livelihoods including supporting non-agricultural activities. These contributions are direct but, equally, they are also often indirect or hidden – a product of the complex interaction of seeds and PGRs with other livelihood resources or strategies.

The table (3.1) below summarises some of these contributions, grouping them into direct or immediate contributions as well as broader contributions to livelihood systems. The information in the table is, of course, not an exhaustive list and many more contributions may be noted. Also while the contributions are listed discretely, interconnections among them do exist. For example, the contributions of seeds and PGRs to food security are closely related to health contributions.

Table 3.1: The contribution of seeds and Plant Genetic Resources to livelihood security

<p>Direct or Immediate Contributions</p>	<p>Food</p> <ul style="list-style-type: none"> • staple foods • wild and weedy foods • famine foods <p>Health/Nutrition</p> <ul style="list-style-type: none"> • medicines • micro-nutrients - links with nutrition <p>Environmental</p> <ul style="list-style-type: none"> • agro-ecological diversity • nutrient cycling • pollination <p>Physical</p> <ul style="list-style-type: none"> • plant-based building materials, fodder, firewood <p>Cultural/spiritual beliefs and practices</p> <p>Income</p>
<p>Contributions to Livelihood Systems</p>	<p>Managing Risk and Responding to Vulnerability</p> <p>Varietal and crop diversity:</p> <ul style="list-style-type: none"> • allows cultivation to be tailored to particular agro-ecological niches • spreads risk of wholesale crop failure due to pests or disease • enables adaptation to climatic variation <p>Building and Maximising Assets</p> <ul style="list-style-type: none"> • seeds may substitute for other assets, such as agro-chemical inputs • selection and use of seeds with particular characteristics enables other assets to be optimised (labour, natural assets) • seeds play a role in social networks: basis for gift-giving or exchange, ritual and ceremonial values <p>Livelihood Strategies</p> <ul style="list-style-type: none"> • agricultural intensification • diversification into non-agricultural activities • migration

3.5. Summary

Implicit throughout the above discussion is an emphasis on the importance of crop and varietal diversity. Diversity, in this context, is particularly important because the appropriateness of seeds and PGRs will vary across particular agro-ecological environments; the significance of particular seeds and PGRs will also be different for households of different socio-economic position and endowments, and will even vary for individuals within households.

Looking at seeds and PGRs from a livelihoods perspective facilitates an appreciation of how seeds and PGRs fit into the bigger picture of people's livelihoods. In this perspective, therefore, the significance of seeds and PGRs extends beyond their contributions to agricultural production and/or genetic diversity to encompass a more holistic understanding of their contribution to diverse livelihoods, and the complexity of their interaction with other livelihood resources and strategies.

These contributions, however, are by no means automatic – realising them relies on gaining access to seeds and PGRs and to other livelihood resources with which they are linked. Without such access, the potential contributions and value of seeds and PGRs mean little. Understanding access is therefore crucial and the next section turns attention to this issue.

4. UNDERSTANDING ACCESS: HOW A SUSTAINABLE LIVELIHOODS PERSPECTIVE CAN INFORM WORK ON SEEDS/PGRS

This section turns to the question of how people gain access to seed/PGR resources in order for these livelihood outcomes to be realised. A focus on access goes beyond looking simply at availability, but focuses on institutional questions of control. This expands our analysis to look at the way institutions, both formal and informal, and policies operate to shape such access. Two key features are evident:

- Such dynamics may operate at the very local level (e.g. through village based institutions) or at more macro levels (e.g. through international regulatory systems, patent control etc.), or through combinations of both.
- A focus on access and institutions requires attention to the politics of power and control, and suggests the need for assessments of the wider political economy of seeds/PGRs.

Rural people may gain access to seeds/PGRs through a number of mechanisms or channels, each of which is affected by a range of institutions and is predicated on particular contextual factors. Given the complexity and contextual nature of access questions, three cases are used. The case studies are: emergency seed relief, wild and weedy foods, and farmer engagement with agricultural research systems.

4.1. Introduction

In what ways do people secure access to seeds and PGRs? How does this differ across households (or, indeed, within them) and in different vulnerability contexts? Access to seeds and PGRs is, of course, a necessary precondition for their use and is therefore essential to realising their contributions to livelihood security. The processes through which access is secured are often, however, poorly understood or under-appreciated, leading to the entrenchment of false assumptions about access, to the neglect of important access routes, and to a limited understanding of the factors that influence and the forces that bear on access.

A livelihoods perspective focuses attention on access, and enables us to unpack what it means in different contexts and for different groups of people. Three elements of a livelihoods approach are particularly useful in understanding diverse and variable issues of access to seeds and plant genetic resources:

1. Asset configuration: access to seeds and plant genetic resources is linked with, and sometimes dependent on access to other livelihood capitals. The combination of assets which a household or individual commands will, in part, affect the extent and nature of their access to seeds and PGRs (e.g. how many channels through which they are able to source seed, what kinds of seeds and plant genetic resources they have access to).
2. Institutional complexity: institutions are crucial in shaping access to seeds and plant genetic resources and/or the other livelihood capitals with which they are linked. Which institutions matter in determining access will vary depending on

the household or individual as well as the particular kind of seeds or PGRs in question, and the channels through which they are available.

3. Strengthening resilience: with its attention to assets, institutions and strategies, as well as the important interactions within and among them, a livelihoods approach can help suggest how particular interventions or broader changes may affect livelihood resilience.

People may gain access to seeds and PGRs in a number of ways through markets, aid programmes, extension services, formal and informal community-based institutions, and others. Some examples of this great range of channels are:

- Seed relief in emergencies through state or donor provision
- Package programmes (e.g. Starter Pack)
- Public or private extension services
- Engagement in agricultural research through participatory plant breeding, varietal selection etc.
- Contract farming with the state or, increasingly, private sectors
- Market mechanisms
- Community-based channels
- Local harvesting of weeds or wild resources

Each of these access pathways is underlain by particular institutional configurations that may be overlapping and contested. For example, community-based channels may rely on more informal institutions of gift-giving and exchange governed by social relations and culture; local harvesting of wild and weedy resources may require negotiation of overlapping informal and formal institutions, such as resource tenure and rights regimes. Which channels are available, and the ways in which they are negotiated, will differ for different households and individuals as well as for different kinds of seeds and PGRs.

To more fully explore how people gain access to seeds and PGRs, and the institutional dynamics around such access, we focus the remainder of the section on three case studies, a subset of the range listed above. We have chosen the case studies deliberately to demonstrate that the issues and questions of access vary across varying contexts, and suggest how in each case a livelihoods approach can help highlight the range of institutions and policies, as well as the links with other assets, that are important in shaping access to seeds and/or plant genetic resources.

Emergency seed provision/relief: In emergency situations the assumption is often made that that seed is unavailable. In many cases, this is not true. Rather, the real challenge is obtaining access to appropriate seeds in sufficient quantities. A livelihoods approach, with its focus on assets and institutions, turns attention to questions of access.

Wild and weedy resources and minor foods: The significance of these resources has often been overlooked in agricultural and rural development strategies, yet these resources are often significant in rural livelihoods, especially for the poor. Accessing these resources usually depends on gaining

access to other livelihood capitals and on negotiating multiple, and sometimes overlapping institutions. A livelihoods approach enables understanding of these processes.

Farmer engagement with agricultural research: Farmers in many parts of the world lack access to plant genetic resources with characteristics suited to marginal environments and low input farming systems. Conventional agricultural research and extension systems have often failed to enable such access, and private sector companies – increasingly important players in the development of seeds and PGRs – show little sign of altering this trend. By drawing attention to the institutions through which farmers access plant genetic resources, a livelihoods approach helps to suggest the ways in which such access may be strengthened.

Together, the case studies demonstrate:

- the assumptions made about access/lack of access;
- neglected channels through which people access seeds and PGRs;
- links with other livelihood resources; and
- the way that local questions of access are ‘connected up’ to institutions and processes at national and international levels.

The range of access issues in each case study is enormous and complex and, given limits of time and space, our discussion of each case is illustrative rather than exhaustive. We intend to use each case to demonstrate the way in which a livelihoods perspective can sharpen the focus and facilitate new ways of thinking about access to seeds and PGRs.

4.2. Case 1: Seed provision in emergencies

In emergency situations, assumptions are often made that the crisis has rendered seed unavailable and, on this basis, direct distribution of seeds is included as a component of many relief efforts. In many cases, these interventions occur with little prior knowledge of how seed systems normally work, how farmers gain access to seeds, to what extent and in what ways seed systems have been affected by the crisis and with what implications for which farmers or groups of people. A livelihoods approach offers a route to better understanding of these issues. This sub-section first offers some background on seed relief and then moves on to consider what value added a livelihoods approach can offer.

Since around 1990, seed relief has become a routine component of relief efforts, particularly in Africa, and is often seen as a complement to food aid (Sperling and Cooper, 2003). The FAO estimates that by the mid-1990s around \$10 million (US) was spent on the procurement of seeds for emergency projects in Africa alone (Sperling, 2002). Seed relief is therefore seen as a way to help farmers recover from shocks, typically brought on by natural disasters or civil conflict, and re-establish their farming livelihoods. ‘The focus has been on replacing a single capital asset, seed, as the leverage point for strengthening broader seed system structures and processes’ (Sperling and Cooper, 2003). Emergency provision is often not, however, a one-off event. In Mozambique, emergency seed provision has occurred almost every farming

season for over a decade (Longley *et al.*, 2002). In contexts of protracted emergencies, seed relief cannot be seen as existing outside the seed system but becomes normalised and integrated. As a regularised pattern of seed relief develops, relief becomes another channel through which farmers may access seed and comes to impact other aspects of the broader seed system.

The myriad goals and objectives, involvement of multiple agencies, and acute time and resource pressures that characterise emergency situations make seed relief inordinately complex. While the logic of seed relief is to rebuild farming livelihoods, multiple simultaneous and sometimes conflicting goals and objectives may characterise a single relief effort. Relief may be provided to fill a temporary gap, encourage self-help, serve as a gift to achieve both political and farming goals, or encourage progressive, modern farming practices (Sperling, 2002; de Barbentane Nagoda and Fowler; 2003; Remington *et al.*, 2002; Tripp, 2001). Different agencies involved in relief may be motivated by different objectives. The highly pressured environment in which relief occurs, and tight time and resource constraints present a further challenge.

Seed relief interventions have recently been subject to close scrutiny (see Disasters, 2002, 26.4) which has yielded the critical insight that the ‘seeds and tools’ approach has underestimated the complexity and dynamics of seed relief: how aid itself works, and how it impacts farmers’ management strategies and sustainability. This analysis, often undertaken by people involved in seed relief, has produced the following findings:

- relief efforts have shown a lack of sensitivity to or understanding of local seed systems;
- farmers have been disappointed by the seed provided;
- the resilience of local seed systems and markets has been underestimated; and
- on-going relief can cultivate chronic or routine dependencies

(See: Haugen & Fowler, 2003; Remington *et al.*, 2002; Sperling, 2002; Tripp, 2001)

Inappropriate seed relief may, at best be unnecessary, and at worst undermine the sustainability and security of existing seed systems.

Box 4.1: Inappropriate Relief? Seed provision in Honduras after Hurricane Mitch

In October 1998 Hurricane Mitch struck Central America causing many deaths and great damage and destruction. In Honduras, flooding, landslides and high winds destroyed homes, infrastructure, and cropland. Crop loss and harvest failure prompted seed relief efforts because it was assumed that farmers would lack sufficient seeds for the next season. Organizations engaged in seed relief distributed a small number of seeds of improved varieties that were certified and promoted. But, with little knowledge of existing seed systems and farming practices, the varieties distributed were not always appropriate for the particular agro-ecological or socio-economic conditions of the recipients. Further, research conducted in the Yorito municipality found that less than 10% of farmers reported that they lacked sufficient seeds for planting. Those who received seed relief also tended to be wealthier and well-connected with the organizations undertaking seed relief.

Several observations and questions may be raised about the experience of seed relief in Honduras:

- Relief may sometimes be driven by questions of supply rather than demand – for example, the choice to provide certified and promoted seed instead of multiplying and distributing local varieties adapted to agro-ecological niches.
- There is a need to distinguish between the need to access seed in sufficient quantities, and the need to access particular varieties as this will possibly affect which sources relief seed is obtained from.
- Seed systems are often poorly understood, and the assumption that there will be widespread lack of access to seeds following a disaster may, in some cases, be misplaced. It is therefore important to distinguish access from availability concerns.
- The presence of external organizations distributing seed following a disaster may undermine the functioning of existing seed systems through which seed is also available, with impacts on longer-term seed system resilience and sustainability as well as genetic diversity.

Source: Haugen and Fowler, 2003; de Barbentane Nagoda and Fowler, 2003.

What can a livelihoods perspective offer?

A livelihoods perspective on seed relief in emergencies provides a way of identifying the sources of seed insecurity and links these with broader issues of livelihood vulnerability and resilience. The framework below has been developed to indicate the different aspects of seed security.

Table 4.1: Seed Security Framework: Basic Parameters

Parameter	Seed Security
Availability	Sufficient quantity of seed of adapted crops within reasonable proximity (spatial availability), and in time for critical sowing periods (temporal availability).
Access	People have adequate income or other resources to purchase or barter for appropriate seeds.
Utilization	Seed is of acceptable quality and of desired varieties (seed health, physiological quality, and variety integrity).

Source: Sperling and Cooper, 2003; Remington 1998; Remington et al., 2002.

Emergency seed relief efforts can be strengthened by a livelihoods approach in several ways. A livelihoods approach helps to show how seed insecurity is often caused by problems of access to seeds, rather than problems of availability (Remington *et al.*, 2002; Longley *et al.*, 2002). Access is identified as one component of the framework, though access issues also engage questions about availability and use: for example, accessing seeds in sufficient quantity and of the appropriate varieties is important for achieving seed security.

While in some cases sources of insecurity caused by access problems may be traced to lack of income or access to credit, a livelihoods approach also draws attention to the messy and complex ‘social life of seeds’. In emergency situations, ‘damage to the social fabric of a seed system is as significant as direct physical loss of seeds’ (Richards and Ruivenkamp, 1997; see Box 4.2 below). A livelihoods approach, by drawing attention to the links between seeds and social relations, as well as to the institutions through which seed may be exchanged in informal systems, can be used to understand what constitutes this social fabric and how it is affected in emergency situations.

Box 4.2: War and the Social Fabric of Seed Systems in Sierra Leone

Customs, practices, knowledge and social relations form the social fabric of seed systems, and are especially vulnerable to disruption or destruction during conflict. In Sierra Leone, over half of all seed rice was obtained through informal non-market channels. Non-market exchange and gifts and loans from friends and family, including patrons, were the major routes for such acquisitions. The Revolutionary United Front insurgency used 'divide and rule' tactics to create division within communities. One of the consequences of the insurgency was that the norms of trust and reciprocity and institutions of seed exchange were severely undermined. Restoring seed systems, therefore, presents not only technical but also complex social challenges for relief and rehabilitation efforts.

Source: Richards and Ruivenkamp, 1997

Given the important social context of seed systems, relief activities may need to also focus on helping to re-build or strengthen the social relations and networks around seeds. Such work is being undertaken through the use of seed fairs (CRS), vouchers that facilitate access to seed through local markets and other systems of exchange.

Of course access to seed is not only determined by the complex of local institutions, wider processes are at play too. With changing patterns of seed ownership, for example, through the consolidation of the seed industry, there may be less choice of seed options for supply in emergency situations. With growing commoditization of seed, channels of access are increasingly through the market, often via a few key companies and their subsidiaries. Seed availability is also affected by regulatory controls governing seed certification and varietal release. This again affects the nature of the local seed system, and the degree to which it is resilient to the impact of shocks and stresses, whether drought, flood or conflict. Gaining access to seed is therefore by no means straightforward. An analysis of the institutional arrangements governing such access for different groups of people – ranging from the micro local level to more national and even international dimensions – is a vital first step in any assessment of options for emergency intervention.

We have seen how lack of understanding about local seed systems prior to emergency relief can lead to inappropriate seed relief which, in extreme cases, may cause more damage to livelihood resilience and sustainability than the crisis itself. Better understanding of local seed systems has been identified as an important area in which seed relief work may be strengthened (Sperling and Cooper, 2003). With this in mind, efforts have been made within the FAO to develop livelihoods based needs assessment which, among other things, will help to identify whether seed relief is appropriate in a given emergency context (FAO, 2003). Work is also being undertaken to develop a Seed System Security Assessment (SSSA). The purpose of these assessments is to identify the formal and informal channels through which farmers access seed, how these differ across different socio-economic groups and regions, and how they have altered over time. The objective of such assessments will be to understand the dynamics that make seed systems vulnerable and identify the underlying causes of seed insecurity.³ With such knowledge, seed relief efforts may be more precisely targeted to ensure that they strengthen rather than displace or undermine existing seed systems and enhance farmers' access to seeds.

³ Communication with Richard China, Coordinator, Rehabilitation and Humanitarian Policies Unit, Emergency Operations and Rehabilitation Division, Technical Cooperation Department, FAO.

4.3. Case 2: Wild and weedy resources and local crops

The local harvesting of wild and weedy resources and the cultivation of so-called ‘minor’ crops are often neglected in many research and development efforts to strengthen rural livelihoods. These efforts tend to focus instead on improving productivity of major staple food or cash crops, often through the investment of sizeable resources in the development of a select few varieties. The development of a relatively small number of high-yielding varieties during the Green Revolution or, more recently, the development of GM crops such as Bt cotton are hallmarks of interventions which have such a focus (Seshia and Scoones, 2003).

While it is often noted that only 3 crops – wheat, maize, and rice – provide over half the global plant-derived energy intake, many plant species which may look insignificant when aggregated at national, regional or global scales emerge as important in particular local settings and, indeed, for particular groups of people such as women and children (FAO, 1998). Crops of this description are more accurately termed ‘local’ than ‘minor’. The importance of these crop species may lie in their nutritional value, in terms of plant-derived energy or protein but also as sources of essential micro-nutrients. They may also be an important source of income-generating activity: rubber tapping and the harvesting of non-timber forest products are notable here (FAO, 1996).

A livelihoods perspective can help to overcome the neglect of certain species that have been deemed ‘minor’ or, worse, ‘weedy’ in many mainstream public and increasingly also private agricultural research systems. It does so by locating local crops and wild and weedy resources within the broader context of people’s livelihood systems: identifying the ways in which they may enhance resilience, strengthen or maintain assets, and contribute to livelihood strategies.

A livelihoods perspective also focuses attention on questions of access, and draws attention to the institutions and processes operating at multiple levels that affect access to these local crops and wild and weedy resources. The remainder of this section will consider how a livelihoods perspective may be used to better appreciate the significance of these resources. It will then address two of the major access issues that emerge around minor crops and wild and weedy resources: first, the question of access to the areas where resources are located; second, the implications for access of increased proprietary claims of ownership and control.

Access within the farm landscape

The terms wild and weedy resources as well as local crops encompass a broad spectrum of plant species that may be more or less intensively managed. These range from foods that grow in uncultivated areas, to cultivated ‘weeds’ harvested in fields, to carefully tended home gardens. Here it is important to note that wild foods may be found on common and marginal land, such as roadsides and pathways, as well as in environments disturbed by erosion.

While any plant that is not part of the major crop is often regarded as a weed, these weeds may have a variety of uses. Weeds are an important source of food and

nutrition for poor households. What is and is not a weed is very much in the eyes of the beholder. The degree to which weeds are managed is variable – sometimes they are self-sown and simply collected when needed; in other cases weeds may be ‘cultivated’ by collecting seeds and scattering them in fields.

Home gardens are complex, multi-story and intensively managed environments. In recent years, they have received substantial attention as their contribution to plant genetic diversity is recognised. For example, in Java, 500 species of plants were found in home gardens in one village (Scoones, *et al.*, 1994). Similarly, in a survey of 30 home gardens in the sub-tropical and tropical central midlands of Vietnam an IPGRI study identified 171 different cultivated species. From a plant genetic resources perspective, home gardens are significant as sites of plant domestication, plant introduction and distribution, experimentation and production, and as a refuge for diversity and cultural heritage (Engels, 2002). ‘At the ecosystem level, the home garden provides a complex micro-environment that links more complex natural ecosystems with agricultural systems.’ (Eyzaguirre and Watson, 2002) In this way, there are important links between home gardens and wild or uncultivated areas as they are sites where wild species may be introduced and cultivated through processes of outcrossing and gene flow.

Wild, weedy and local crops make substantial contributions to livelihood security, especially through their contributions to nutrition where they are an important source of micro-nutrients, fibre and anti-oxidants (Johns and Eyzaguirre, 2002). This contribution is often, however, overlooked resulting in a ‘hidden harvest’: for example, in the maize-dominated system in Bungoma, Kenya, people consume 100 different species of vegetables and fruit (Scoones, *et al.*, 1994). Wild and weedy foods enable households to strengthen their resilience when confronted with seasonal or sudden changes in agro-ecological and climatic conditions. Particular foods may fit certain seasonal niches – in Zimbabwe, for example, fruit acts as alternative to grain in the dry season and constitutes 1/4 of all meals (Scoones, *et al.*, 1994). When crops fail, wild foods become important in sustaining livelihoods during famine. The role of famine foods in supplementing and sustaining local diets has been documented in both the Ethiopian and Ugandan famines of the 1980s (Rahmato, 1988; Biellik and Henderson, 1981).

Access to wild and weedy foods is an important part of strategies of livelihood diversification, and is particularly important for poor households, which may lack access (or access in sufficient quantities) to food for consumption, either through subsistence production or market mechanisms. The significance of wild and weedy foods also varies within households. Women are often associated with the collection and use of weeds and wild foods, as well as the management of home gardens. Collection of wild fruits is also an important component of children’s diets.

The simplification of agro-ecosystems through conversion of forests to pastures may result in the loss of wild foods and income-generating resources. Similarly, agricultural intensification and associated increased use of fertilisers may wipe out important weedy species from cultivated land. It is, however, difficult to make generalizations about the effects of agro-ecological changes, for these processes are not so simple and vary greatly across contexts. While woodlands are converted to

agricultural land, new species may appear; while agricultural intensification may eliminate certain species it may also lead to the growth of others.

Institutional change often accompanies or underpins agro-ecological change, and may be as, or indeed more, significant in determining access to wild and weedy resources. From a livelihoods perspective, what is important to consider is how access is affected and for whom. This requires attention to the other capital assets with which wild and weedy resources are linked, and the institutions that shape access to these other assets.

Access to wild and weedy foods relies crucially on access to land. Land and resource tenure arrangements are therefore key, with the relationship between more privately held spaces (e.g. gardens and fields) and the wider commons (of forests, rangelands etc.) being a key dynamic. As the now vast literature on land and resource tenure shows, institutions that affect access to land and wild resources need not be formal. Informal claims, concessions and arrangements are also important in determining access. But often, accessing the resources will require negotiation of overlapping institutional arrangements. This institutional complexity, consisting of overlapping, parallel or indeed conflicting institutions, systems of management and administration and forms of authority, is often compounded by processes of decentralization (SLSA Team, 2003). Support for efforts to negotiate these arrangements may be an important avenue for interventions in this area.

Property rights and regulatory frameworks

The above discussion has focused mainly on access to wild and weedy foods, but increasingly access will be shaped by emerging regulatory frameworks regarding the ownership and control of plant genetic resources. At the international level these include the Agreement on Trade Related Aspects of Intellectual Property (TRIPs), the Convention on Biological Diversity, and International Treaty on Plant Genetic Resources for Food and Agriculture. Nationally, these frameworks open up new law and policy-making areas around the governance of seeds and plant genetic resources. The effects of these changes will, increasingly, be felt locally by people whose livelihoods rely on access to and use of such resources. The commercial significance of wild and weedy resources, as well as 'minor' or 'neglected' crops is likely to increase as commercial interest grows in their medicinal, nutritional and other properties.

One important activity in which connections between 'local' and 'global' are forged is bioprospecting.⁴ As international agreements and national legislation facilitate the making of proprietary claims to plant genetic diversity, and replace the much contested principle of it as 'common heritage', Access and Benefits Sharing (ABS) arrangements are becoming an important part of bioprospecting activities (Swiderska, 2001). Indeed, in recent years benefit-sharing has been an important component of bioprospecting undertaken by public and private organizations alike, including the International Cooperative Biodiversity Group (ICBG), Shaman Pharmaceuticals, Novartis and the US National Cancer Institute (Brush, 1999; King *et al.*, 1996; UNED-UK and Novartis, 2000; May *et al.*, 1996).

⁴ Bioprospecting refers to the exploration, collection, and investigation of the elements, including genetic resources, found within biodiversity for research or commercial purposes. (see ten Kate and Laird, 1999; Reid, 1993)

Growing commercial and proprietary claims to plant genetic resources have prompted local level responses. These include efforts to document local knowledge about PGRs, and the establishment of community registers and genebanks. While these efforts are often viewed as mechanisms to protect and recognise local knowledge about and access to genetic diversity, they nonetheless require careful and critical attention to issues of knowledge, power and control (see Box 4.3 below).

Box 4.3: New challenges for access: Kerala's plant biodiversity registers

As part of Kerala's most recent five-year plan, the state has allocated substantial financial and administrative resources to establish biodiversity registers at the *gram sabha* (village) level. The registers are considered necessary to recognise, reward and promote local knowledge, encourage sharing among communities, and protect such knowledge from being privately appropriated by commercial interests. In the district of Ernakulam, 86 registers have been established, each consisting of an introduction, background information on the panchayat involved, a summary of biodiversity within the panchayat's jurisdiction, detailed data sheets and a bibliography.

The creation of the registers, however, raises new questions about access. Concerns have been expressed that knowledge once regarded as 'secret' has been placed in the public domain and may become easily accessible to corporate and research interests. The absence of clarity about who controls the registers has potentially serious consequences for who is able to access the registers and for what purposes.

Efforts to record local knowledge about plant genetic resources raise new and as yet unanswered questions about access: who should have control of the information contained in the registers? how should access to the registers be regulated? what mechanisms should be in place to share any benefits resulting from such access?

Source: Anuradha, Taneja and Kothari, 2001

Attention to institutions and policies recognises the real-life complexity and messiness of institutional arrangements that people must negotiate to secure access to seeds and plant genetic resources. Such messiness may stretch from the local negotiation of access across different, overlapping tenure regimes at the village level to the multiple jurisdictions and competing claims over plant genetic resources between the international public and private sectors. Such analysis draws attention to the multiple levels at which institutions operate, and is therefore valuable in tracing the way institutional and regulatory changes at national and international levels play out locally. Though its focus/origin is local (and this is crucial), using such a perspective one can look up and out at the processes and institutions that connect local resource users with broader national and international processes of regulatory and politico-economic change.

4.4. Case 3: Engaging with Research: Farmers' Access to Plant Genetic Resources

Focusing on access to plant genetic resources requires attention to processes of agricultural research and critical analysis of institutions that determine what plant genetic resources get developed and for whom. A livelihoods perspective, which draws attention to policies, institutions and processes, can help promote better understanding of the way in which formal systems of agricultural research (constituted by particular configurations of policies, institutions and processes) may

or may not serve to strengthen farmer access to PGRs. As a people-centred approach that emphasises people's agency and ingenuity, it regards farmers not as 'end-users', 'clients' or 'recipients' of seeds, but as actively engaged in their own processes of plant breeding and with broader agricultural research and extension systems.

Historically, agricultural research has been a linear process, in which formal sector plant breeders implementing a research agenda develop seeds and technologies that are then transferred to farmers through a 'pipeline' approach to extension (Manicad and McGuire, 2000; Batz and Dresrüsse, 2000). This model has led to vast increases in yields – in India, this model of research and extension drove the Green Revolution (Seshia and Scoones, 2003). But it also has led to great disparity; as many of the seeds developed through such processes are not suited to more marginal environments or the socio-economic conditions of resource-poor farmers (Batz and Dresrüsse, 2000). 'The failure effectively to involve farmers in the process of governance, planning, priority setting, financing and evaluation...' (Batz and Dresrüsse, 2000) has been recognised as a key reason for the slow progress that agricultural research has made in developing seeds appropriate for resource-poor farmers.

A similar research paradigm prevails in the development of agricultural biotechnology, though the process of its development is led by the private rather than the public sector. Given the failure of many Green Revolution technologies to be useful to resource-poor farmers, there is a danger that any benefits to be gained from agricultural biotechnologies may also by-pass poor farmers. (Manicad and McGuire, 2000). Conventional research paradigms, therefore, have tended to deny access by farmers to seeds with appropriate genetic traits or expressions for their environments and agro-ecological conditions.

In recent years efforts have been made to involve farmers in agricultural research, with the aim of drawing on plant genetic resources appropriate to local conditions and so enable the development of a greater range of appropriate seed varieties. A huge array of names and activities has emerged around these efforts, and has received substantial attention: farmer-responsive research, participatory agricultural research, participatory plant breeding, participatory varietal selection, participatory technology development. While the term 'participation' invariably appears in most of these efforts, it is important to note that the meaning of participation varies. In certain contexts, participation may be instrumental – used primarily to develop more appropriate seeds and technologies, while in other contexts it may be part of process-oriented approaches that emphasise capacity-building and social transformation.

Box 4.4: Participatory Development of new Varieties of Maize in Sol da Manhã

In the early 1980s farmers migrated to new settlements around Rio de Janeiro. The farming conditions in these areas were subject to a variety of stresses: low soil organic matter, low nitrogen and pH, high aluminium and periods of heat and drought stress alternating with waterlogging. In 1984, farmers in the settlement of Sol da Manhã approached the National Agrobiological Research Center of Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA) for assistance in identifying maize varieties suited to these conditions. Over the next ten years farmers participated in iterative processes of evaluation and selection. In 1998 the variety *Sol da Manhã NF* was officially released after it had been settled in court that the variety would be registered in the public domain because the input of farmers had been essential and therefore did not allow for exclusive plant breeders rights or patenting.

Source: Machado, 2000

While the differences among them are considerable, participatory approaches to agricultural research are likely to be more grounded in the realities of farmers' livelihoods and attuned to their needs and the opportunities and constraints they face.

Participatory plant breeding and varietal selection has demonstrated have important it is to use farmers' own understanding of their livelihood system to select traits and make best use of available germplasm. Simple participatory ranking techniques, for example, highlight how prioritization of crop characteristics differs by social group (men, women, rich, poor and so on) as well as by agroecological setting. Effective responses to livelihood needs require moving away from a one-size-fits-all approach to technology development and design. Such a challenge applies as much to conventional plant breeding as it does to advanced techniques of plant biotechnology. Yet too often plant breeders and genetic engineers do not understand these needs, and instead are focused on particular traits which may not be as relevant to farmers.

Making the most of local germplasm thus requires an approach which looks at the institutional and policy context in the whole innovation and delivery chain, including:

- Priority setting in research and development
- Experimental design and analysis
- Intellectual property rights and plant variety protection
- Varietal release and seed certification
- Extension and service provision
- Monitoring of effectiveness at meeting local needs
- Feedback to research and development processes

While there have been some innovative experiments with participation in some elements of this sequence in some public sector systems and with some NGO pilots, a full integration of farmer priorities into the whole innovation system has been limited. Efforts have been piecemeal and in many instances not sustained. This has been particularly the case following the retraction of the public sector (including the international one) due to funding constraints imposed by structural adjustment policies, for example.

A key challenge – as yet unmet and barely thought about – is how to follow through with this sort of innovation in a more integrated way both in the public sector R&D system, but perhaps more significantly in the private sector. With a few major companies dominating the world market in seeds, the challenge of incorporating a farmer-oriented livelihood focused approach in this context remains enormous. Multinational seed houses and biotech companies exist to make profits from their business. But the challenge for public policy – both at national and international levels – is to see what levers, incentives, requirements can be imposed to ensure that poor farmers in the developing world do not lose out.

This requires a detailed analysis of each of the elements of the fast changing, increasingly globalized, but highly differentiated innovation and delivery chain (see above) and an assessment of what public policy entry points can be identified to improve livelihood outcomes for the poor.

4.5. Summary

Access to seeds and plant genetic resources may occur through diverse channels. These channels are shaped by institutions, organizations and policies working at different levels – ranging from local, informal institutions to international frameworks. Understanding access to seeds and PGRs, with a view to strengthening interventions, demands recognition of these channels or routes and attention to the institutions, organizations and policy that shape them. Although different types and levels of institutions are distinguished, it is important to note the ways in which they connect, overlap, reinforce or conflict in practice, the particular institutional dynamics this produces, and how this affects the ways in which people negotiate this institutional complexity. The table (4.2) below summarises the case studies considered in this section, identifying for each case what current gaps exist, what some of the issues and questions of access are, and how a livelihoods perspective can lead to a better understanding of access.

Table 4.2: Overview of case studies

	Seed Provision in Emergencies	Access to Wild and Weedy Resources	Farmer Engagement with Research Systems
Gaps in current thinking and practice	Relief focus on making seed available fails to consider issues of access and the dynamics of local seed systems, with the result that relief may be inappropriate.	Wild and weedy resources, as well as local crops, play an important role in livelihoods, especially for the poor, but they are often neglected in development policy and practice.	Crop development in the formal sector (both private and public) has occurred with little input from resource-poor farmers. The informal systems through which farmers gain access to genetic diversity have been overlooked.
Value-added of a livelihoods perspective	<ul style="list-style-type: none"> • Focus on seed systems and the channels through which people access seed. • Broader view of livelihoods: trace the way a crisis may affect other assets, institutions and strategies and how this may affect access to seeds. • Highlights the important role of social capital – the ‘social fabric of seed systems’ • Enables interventions to be more precisely targeted to restore and strengthen resilience 	<ul style="list-style-type: none"> • Traces the varied contributions of these resources to livelihood assets • Locates the use of these resources as part of livelihood strategies of diversification • Identifies how wild and weedy resources, minor crops and home gardens enhance livelihood resilience • Traces the impacts of agro-ecological and institutional change, with particular attention to how institutions operating at multiple levels mediate access to these resources. • Helps identify the significance of these resources for different groups of people 	<ul style="list-style-type: none"> • Focus on the realities of farming systems and rural livelihoods, with attention to the particular agro-ecological and socio-economic conditions experienced by farmers. • Promotes attention to the needs and priorities of different groups of people in relation to the development of PGRs. • Highlights the importance of genetic diversity, and the informal channels through which diversity is accessed, in livelihoods. • Draws attention to the institutional structures and policy contexts that mediate access to genetic material.
Access Issues	Access to seed in sufficient quantities and of appropriate varieties to achieve seed security.	<ul style="list-style-type: none"> • Access to the resources themselves as well as the areas where they are located. • Access to genetic material from wild relatives to enable local experimentation, adaptation. 	<ul style="list-style-type: none"> • Access to plant genetic diversity and genetic material suited to particular localised agro-ecological and socio-economic conditions. • Access to institutions and organizations that develop and store plant genetic material.
Institutions, Policies, Processes	<ul style="list-style-type: none"> • Systems of non-market exchange: gifts, loans, exchange (cash, labour, or other assets) • Market channels, especially local markets • Credit institutions, formal and informal • Seed quality and certification policies 	<ul style="list-style-type: none"> • Common property regimes • Property rights: formal, customary, informal • Resource tenure regimes and usufruct rights • Natural resource management policy and institutions • Processes of decentralization • Regulatory frameworks: intellectual property, access and benefit sharing • Community biodiversity registers and seed banks 	<ul style="list-style-type: none"> • National and international research and extension systems • Certification policies • Intellectual property rights and benefit sharing frameworks • Local institutions and organizations (seed fairs, seed banks)
Entry points/ challenges (some examples)	a) Assessment of the livelihood setting/ seed systems in advance of interventions b) Identification of multiple routes of access, including local ones	a) Wider assessment of the impacts of agricultural and tenure change. b) Assessment of livelihood impacts of agreements/legislation governing property rights	Farmer-led and designed R and D systems in the public and private sectors including a) priority setting b) experimental design c) ownership and IP.

5. FUTURE DIRECTIONS: DEVELOPING A FRAMEWORK FOR ACCESS TO SEEDS/PGRS

This final section ties together issues and themes emerging from analysis in the previous sections. It offers a framework - or perhaps more accurately a structured checklist of possible questions to ask when looking at ways of improving access to seeds and PGRs. The key point of this framework is to suggest that seed/PGR interventions must be aware of a range of factors not usually in the frame. It also points to the limits of conventional seed/PGR interventions focused as they have tended to be on a) technical interventions and/or b) local scope.

With a livelihoods perspective 'seeds/PGR interventions' may look somewhat different. For example, they may entail strengthening local capacity to access seeds in emergency situations instead of, or as a complement to, a conventional 'seeds and tools approach'. While efforts to enhance and improve traditional systems of seed management and use are to be encouraged, wider processes (involving say markets dominated by large multinational seed houses, and governed by national and international regulations) may be increasingly important. Taking this broader view - encompassing a wider political economy of seeds/PGRs - is essential to any livelihoods focused initiative.

The study concludes by identifying ways of further developing a livelihoods approach to issues of access around seeds and PGRs.

5.1. Introduction

At the outset of this report, we noted that while a technical focus on seeds is important, alone it is insufficient to fully realise the contributions seeds and PGRs make to achieving food security and eliminating poverty. In the preceding sections, we demonstrated how a sustainable livelihoods perspective helps to locate seeds and PGRs in the broader context of people's livelihoods by a) identifying their contributions to livelihood security and b) drawing attention to crucial issues of access. Section III highlighted the direct contributions seeds and PGRs make to livelihoods, for example, through food and income. But, using an SL perspective, it also showed how seeds and PGRs fit into dynamic livelihood systems and facilitate complex strategies that enable adaptation to changing and often uncertain vulnerability contexts.

Strengthening access to seeds and PGRs is, of course, a central concern of this paper, however, a key point emerging from the discussion is that access to seeds and PGRs is not a single issue that can be understood in a uniform way, but rather an umbrella for many issues. While a livelihoods approach highlights the importance of access to natural resources, including seeds and PGRs, in achieving sustainable livelihoods, it also underscores how access issues vary greatly in different settings and for different groups of people. The great variation across settings is evident in the three case studies on emergency relief, wild and weedy foods, and farmer engagement with agricultural research (see Table 4.2). Two further important factors that are sources of the context specific nature of access issues are:

- Resource differentiation: broadly, issues of access to seeds may differ from issues of access to plant genetic resources and from vegetatively propagated

material; questions of access will differ depending on the particular type of seed or PGR in question.

- Social differentiation: differences in wealth, gender, age, and other social differences will affect the kinds of resources which people can (or cannot) access and shape the pathways which people are able to pursue to secure access.

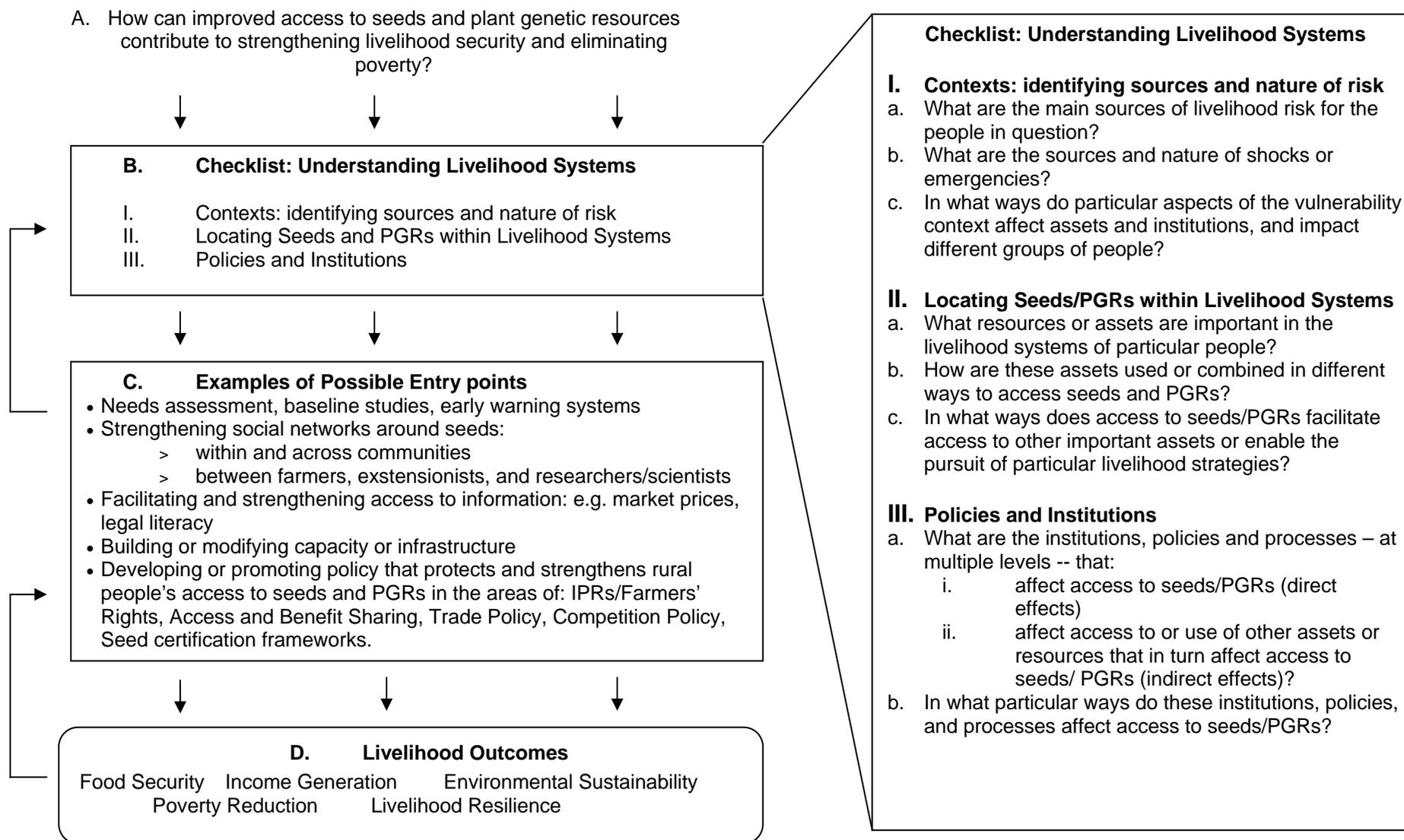
The above two factors have been touched on in this study, but there is substantial room for further exploration.

While issues of access vary greatly, a unifying theme that runs through this analysis is the centrality of institutions. Attention to institutions provides a way of thinking across contexts. We have seen how, in each case study, institutions work to shape and mediate access to seeds and PGRs. Which institutions matter does, of course, depend on the context, resource and people in question. Box 2.1 provided a sense of the range of institutions that affect access to seeds and PGRs. More often than not, institutions bearing on local access overlap and exist at multiple levels, ranging from the local, through to the national and international. To understand and strengthen access, therefore, a multi-level focus on institutions is key.

5.2. A framework to assist efforts to strengthen access to seeds and PGRs

Seeing, not to mention trying to understand, the bigger picture in which seeds and PGRs connect with livelihoods, is not always straightforward. Drawing together the analysis in previous sections, we offer a framework and checklist of questions to facilitate thinking about access to seeds and PGRs and appropriate entry points (Figure 5.1).

Figure 5.1: Strengthening access to seeds and PGRs: a framework to assist informed decisions and actions



In Figure 5.1 we begin with an overarching question (A): How can improved access to seeds and plant genetic resources contribute to strengthening livelihood security and reducing poverty? Following the livelihoods framework we offer a checklist (B) that identifies three areas to be considered to understand issues of access to seeds and PGRs: understanding contexts, locating seeds/PGRs in livelihood systems and, finally, policies and institutions. On the right-hand side of the page, we develop this checklist by offering possible questions that may be asked when considering interventions or entry points to achieve a series of mutually supportive livelihood outcomes. Asked systematically in sequence, responses to these questions help to identify entry points (C) where work on access to seeds and plant genetic resources may be strengthened to achieve a series of mutually supportive livelihood outcomes (D).

Strengthening access to support livelihoods is, however, not a static or linear process. A feedback loop linking outcomes back to possible entry points is used to suggest an iterative process in which the impacts of interventions are assessed against desired outcomes. Given the dynamism of rural livelihoods, a similar feedback loop links entry points back to the checklist and is used to indicate that understanding livelihood systems is important not only in advance of the initiation of an intervention or activity but also throughout the project or programme cycle. Both of these feedback loops, therefore, highlight the need for monitoring and evaluation activities.

The framework above is offered as a way of thinking broadly about access to seeds and PGRs. It is by no means rigid and the intention is that it will serve as a springboard to assist ways of thinking about and working on issues of access to seeds and PGRs. Consequently, it is very much open to modification, adaptation and further development according to the conditions and challenges of particular contexts.

The examples of possible entry points (C) emerging from an SL approach look considerably different from more standard interventions that focus on provision, production and conservation. This is not to negate the importance of these activities, but instead to suggest ways in which they may be strengthened by taking account of the wider livelihood context. For example, we have noted that work being done in the Technical Cooperation Department of the FAO seeks, where possible, to inform emergency relief efforts using livelihoods-based needs assessments and seed system security assessments.

The SL focus on institutions, however, also identifies entry points that have typically not been within the frame of action. In each case study, though especially in Case 1 and Case 3, an SL perspective highlights the importance of social networks and institutions around seeds and PGRs. Strengthening these networks and institutions is therefore crucial to improve access to seeds and PGRs, particularly for the resource-poor. Activities that support these networks, such as participatory approaches to agricultural research and development, are crucial in this regard. This may also involve modifying or changing existing capacity or infrastructure – for example, improving genebank support to post-conflict and post-disaster agriculture (see Richards and Ruivenkamp, 1997).

In many ways then a livelihoods approach offers a different way of thinking about seeds and PGRs that is, nonetheless, compatible with other approaches. To reiterate this is characterised by, among other things:

- Starting with locally defined problems, but tracing upwards and outwards and identifying key connections with broader institutions, policies and processes.
- Entry points that are focused on livelihood challenges as identified by poorer farmers; these may be both micro and macro and cut across sectors.
- Interventions which combine the technical with the social-legal-political.
- A socially differentiated focus on access to resources not just their overall availability or technical efficacy.
- A multi-sited and multi-disciplinary approach to analysis and programming.
- Organizational responses from implementing agencies and governments that address the challenge of thinking and working in a livelihoods oriented way.

5.3. Next Steps

While this study has suggested broadly where and how and livelihoods perspective may inform work on seeds and PGRs, there is clearly need for further work in this area. We identify here several ways in which this work may be taken forward.

1. Given that issues of access to seeds and PGRs differ greatly across contexts, we based our analysis around three case study areas to suggest the ways in which an SL approach could inform understanding of issues of access. Each case – Emergency Relief, Access to Wild and Weedy Foods and Farmer Engagement with Agricultural Research Systems – represents a vast area in which work is occurring. Further focus is needed. Therefore:
 - **Using analysis grounded in concrete activities going on in the field, further develop work to look at ways of strengthening access to seeds and /or PGRs in the context of emergency relief, access to wild and weedy foods and farmer engagement with agricultural research systems.**
2. In selecting three case study areas, we necessarily excluded many other potential areas that could also benefit from an SL perspective. Therefore:
 - **Extend the range of areas or cases where an SL perspective may be used, drawing on field-based activities.**
3. Throughout this study we have emphasised the centrality of institutions and highlighted how institutions, operating at multiple levels, work to shape local access to resources, including seeds and PGRs. While a SL approach is always locally-grounded (see above), this need not mean that it must be locally-focused. Yet, making these links in practice often proves elusive and thinking often remains dichotomised around ‘local’ vs. ‘global’ without due consideration given to the ways in which they are linked. Therefore:
 - **Develop practical methods to better understand multi-level institutional dynamics and their implications for local access by socially differentiated groups of people.**

5.4. Concluding Comment

Looking at seeds and plant genetic resources using a livelihoods perspective directs focus on the many ways in which they contribute to dynamic livelihood systems and exposes a range of complex, and often neglected, access issues. Focused work to strengthen access to seeds and PGRs requires locating these resources within the broader context of livelihood systems and attention to the multiple and multi-scale institutions that mediate access. Institutional complexity that is local, but also, ever more global, presents substantial and sometimes entirely new challenges for securing local access to seeds and PGRs and for achieving goals of food and livelihood security and sustainability. Meeting these challenges and improving access to these resources calls for the development of new kinds of thought and practice to better understand how seeds and PGRs are located within livelihood systems and to enable locally grounded work that spans institutional scales. It is hoped that this study will contribute to efforts to activate such a process.

REFERENCES

- Anuradha, R.V, Bansuri Taneja and Ashish Kothari. (2001) *Experiences with Biodiversity Policy-Making and Community Registers in India*. Participation in Access and Benefit-Sharing Policy, Case Study No. 3. London: International Institute for Environment and Development.
- Batz, F-J and G. Dresrüsse. (2000) 'Making agricultural research more farmer-responsive: challenges for future development cooperation', *Quarterly Journal of International Agriculture*, 2000 (1): 109-25.
- Baumann, P. (2002) 'Improving Access to Natural Resources for the Rural Poor: A Critical Analysis of Central Concepts and Emerging Trends from a Sustainable Livelihoods Perspective'. Paper produced for Livelihoods Support Programme Sub-Programme 3.1, Food and Agriculture Organization of the United Nations. E-mail: lsp@fao.org
- Biellik, R.J. and P.L. Henderson. (1981) 'Mortality, nutritional status and dietary conditions in a food deficit region: North Teso District, Uganda, December 1980'. *Ecology of Food and Nutrition*, 11: 163-70.
- Brush, Stephen. (1999) 'Bioprospecting the public domain', *Cultural Anthropology*, 14(4): pp. 535-55.
- Carney, D. (ed) *Sustainable Rural Livelihoods: What Contribution Can We Make?* Papers presented at the Department for International Development's Natural Resources Advisers' Conference, July 1998. London: Department for International Development.
- Chambers, R. and G. Conway. (1992) 'Sustainable Rural Livelihoods: Practical Concepts for the 21st Century,' *IDS Discussion Paper No. 296*. Brighton: Institute of Development Studies.
- Cotula, L. (2002) 'Improving Access to Natural Resources for the Rural Poor: The Experience of FAO and Other Key Organizations from a Sustainable Livelihoods Perspective'. Paper produced for Livelihoods Support Programme Sub-Programme 3.1, Food and Agriculture Organization of the United Nations. E-mail: lsp@fao.org
- de Barbentane Nagoda, S. and C. Fowler. (2003) 'Seed Relief After Hurricane Mitch in Honduras: A Critical Analysis of Institutional Responses', *The Journal of Humanitarian Assistance*.
- DfID. (2002) *Better Livelihoods for Poor People: The Role of Agriculture*. London: Department for International Development.
- Drèze, J. and A. Sen. (1989) *Hunger and Public Action*. Oxford: Clarendon Press.
- Engels, J. (2002) 'Home Gardens: A Genetic Resources Perspective'. In *Home Gardens and in situ Conservation of Plant Genetic Resources in Farming Systems, Proceedings of the Second International Home Gardens Workshop, 17-19 July, Witzenhausen, Federal Republic of Germany*. Eds. J.W. Watson and P.B. Eyzaguirre. Rome: International Plant Genetic Resources Institute. pp. 3-9.
- Eyzaguirre, P. and J. Watson. (2002) 'Home Gardens and Agrobiodiversity: an Overview Across Regions'. In *Home Gardens and in situ Conservation of Plant Genetic Resources in Farming Systems, Proceedings of the Second International*

Home Gardens Workshop, 17-19 July, Witzenhausen, Federal Republic of Germany. Eds. J.W. Watson and P.B. Eyzaguirre. Rome: International Plant Genetic Resources Institute. pp. 10-13.

Farrington, F., D. Carney, C. Ashley, C. Turton, (1999) 'Sustainable Livelihoods in Practice: Early Applications of Concepts in Rural Areas.' *Natural Resource Perspectives, No. 42.* London: Overseas Development Institute. Available online.

Food and Agriculture Organization. (1996) *The Global Plan of Action: The Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture: The State of the World Report.* Rome: FAO.

—. (1998) *The State of the World's Plant Genetic Resources for Food and Agriculture.* Rome: FAO.

—. (2000a) *The Strategic Framework for FAO 2000-2015: A Summary.* Rome: FAO. Available online: http://www.fao.org/docrep/x3551e/x3551e00.htm#P-1_0

—. (2000b) *Inter-agency experiences and lessons: from the forum on operationalizing sustainable livelihoods approaches.* Pontignano (Siena) 7-11 March 2000. Rome: FAO.

—. (2003) *Guide for Emergency Needs Assessments DRAFT,* 27 February 2003.

Giddens, A. (1979) *Central Problems in Social Theory: Action, Structure and Contradiction in Social Analysis.* London: MacMillan.

Haugen, J.M. and C. Fowler. (2003) 'Re-assessing the Need for Emergency Seed Relief Post-Disaster: The Case of Honduras After Hurricane Mitch,' *The Journal of Humanitarian Assistance.*

IPGRI Regional Office for Sub-Saharan Africa. (2002) *Programme for the Development of Strategies for In Situ Conservation and Utilization of Plant Genetic Resources in Desert Prone Areas of Africa, Final Report.* Nairobi: IPGRI Regional Office for Sub-Saharan Africa.

Johns, T. and P. Eyzaguirre. (2002) *Nutrition and the Environment.* In Nutrition: A Foundation for Development. ACC/SCN, Geneva. Available online: <http://www.unsystem.org/scn/Publications/foundation4dev/05Environment.pdf>

King, Stephen *et al.* (1996) 'Biological Diversity, Indigenous Knowledge, Drug Discovery and Intellectual Property Rights'. In Stephen Brush and Doreen Stabinsky, eds. *Valuing Local Knowledge: Indigenous People and Intellectual Property Rights.* Washington, DC: Island Press.

Leach, Melissa, Robin Mearns and Ian Scoones. (1997) 'Challenges to Community-Based

Sustainable Development: Dynamics, Entitlements, Institutions', *IDS Bulletin*, 28(4): 4-22.

Longley, C. (2000) *A Social Life of Seeds: Local Management of Crop Variability in North-Western Sierra Leone.* PhD Thesis. Department of Anthropology, University of London.

Longley, C., C. Dominguez, M. A. Saide, W. J. Leonardo. (2002) 'Do Farmers Need Relief Seed? A Methodology for Assessing Seed Systems', *Disasters*, 26(4): 343-355.

- Machado, A.T. (2000) 'The collaborative development of stress-tolerant maize varieties in Rio de Janeiro, Brazil'. In *Encouraging Diversity: the Conservation and Development of Plant Genetic Resources*. Eds. C. Almekinders and W. de Boef. London: Intermediate Technology Publications. pp. 199-202.
- Manicad, G. and S. McGuire. (2000) 'Supporting Farmer-led Plant Breeding', *Biotechnology and Development Monitor*, No. 42: pp.2-7.
- May, Thomas D., *et al.* (1996) 'Quid pro quo: alternatives for equity and conservation'. In Stephen Brush and Doreen Stabinsky, eds. *Valuing Local Knowledge: Indigenous People and Intellectual Property Rights*. Washington, DC: Island Press.
- Mehta, L., M. Leach, P. Newell, I. Scoones, K. Sivaramakrishnan, S. Way. (1999) 'Exploring Understandings of Institutions and Uncertainty: New Directions in Natural Resources Management', *IDS Discussion Paper, No. 372*. Brighton: Institute of Development Studies.
- Moser, Andy and Caroline Moser. (2001) 'To Claim Our Rights: Livelihood Security, Human Rights and Sustainable Development.' Concept Paper prepared for Workshop on Human Rights, Assets, Livelihood Security and Sustainable Development, London: ODI.
- North, D. (1990) *Institutions, Institutional Change and Economic Performance*. Cambridge: Cambridge University Press.
- Rahmato, D. (1988) 'Peasant survival strategies in Ethiopia', *Disasters*, 12: 326-44.
- Remington, T., S. Walsh, E. Charles, J. Maroko, P. Omanga. (2002) 'Getting Off the Seeds-and-Tools Treadmill with CRS Seed Vouchers and Fairs,' *Disasters*, 26(4): 316-328.
- Richards, P. and G. Ruivenkamp. (1997) *Seeds and Survival: Crop Genetic Resources in War and Reconstruction in Africa*. Rome: International Plant Genetic Resources Institute.
- Scoones, I. (1998) 'Sustainable Rural Livelihoods: A Framework for Analysis', *IDS Working Paper No. 72*. Brighton: Institute of Development Studies.
- Scoones, I., M. Melnyk and J. Pretty. (1994) *The Hidden Harvest: Wild Foods and Agricultural Systems: A Literature Review and Annotated Bibliography*. London: International Institute for Environment and Development.
- and C. Toulmin. (1999) 'Soil nutrient budgets and balances: what use for policy?' *IIED Drylands Programme, IIED Managing Africa's soils, No. 6*. London: International Institute for Environment and Development.
- and W. Wolmer. (2003) 'Introduction: Livelihoods in Crisis: Challenges for Rural Development in Southern Africa', *IDS Bulletin*, 34(3): 1-14.
- Sen, A. (1981) *Poverty and Famines: An Essay on Entitlements and Deprivation*. Oxford: Clarendon Press.
- Seshia, S. and I. Scoones. (2003) 'Tracing Policy Connections: The Politics of Knowledge in the Green Revolution and Biotechnology Eras in India', *IDS Working Paper No. 188*. Brighton: Institute of Development Studies.
- SLSA Team. (2003) 'Decentralisations in practice in Southern Africa', *IDS Bulletin*, 34(3): 79-96.

Sperling, L. (2002) 'Emergency Seed Aid in Kenya: Some Case Study Insights on Lessons Learned During the 1990's', *Disasters*, 26(4)

Sperling, Louise and David Cooper. (2003) *Understanding Seed Systems and Strengthening Seed Security: A Background Paper*.

Swift, Jeremy (1989). 'Why are rural people vulnerable to famine?,' *IDS Bulletin*, 20(2): 8-15.

Tripp, Robert. (2001) *Seed Provision and Agricultural Development*. London: Overseas Development Institute.

UNED-UK and Novartis (1999). *Bioprospecting and Benefit Sharing*. Report of a UNED-UK/Novartis workshop hosted by the Rockefeller Foundation, New York, 22 April 1999.

Further information about the LSP

The Livelihood Support Programme (LSP) works through the following sub-programmes:

Improving people's access to natural resources

Access of the poor to natural assets is essential for sustainable poverty reduction. The livelihoods of rural people with limited or no access to natural resources are vulnerable because they have difficulty in obtaining food, accumulating assets, and recuperating after shocks or misfortunes.

Participation, Policy and Local Governance

Local people, especially the poor, often have weak or indirect influence on policies that affect their livelihoods. Policies developed at the central level are often not responsive to local needs and may not enable access of the rural poor to needed assets and services.

Livelihoods diversification and enterprise development

Diversification can assist households to insulate themselves from environmental and economic shocks, trends and seasonality – in effect, to be less vulnerable. Livelihoods diversification is complex, and strategies can include enterprise development.

Natural resource conflict management

Resource conflicts are often about access to and control over natural assets that are fundamental to the livelihoods of many poor people. Therefore, the shocks caused by these conflicts can increase the vulnerability of the poor.

Institutional learning

The institutional learning sub-programme has been set up to ensure that lessons learned from cross-departmental, cross-sectoral team work, and the application of sustainable livelihoods approaches, are identified, analysed and evaluated for feedback into the programme.

Capacity building

The capacity building sub-programme functions as a service-provider to the overall programme, by building a training programme that responds to the emerging needs and priorities identified through the work of the other sub-programmes.

People-centred approaches in different cultural contexts

A critical review and comparison of different recent development approaches used in different development contexts is being conducted, drawing on experience at the strategic and field levels in different sectors and regions.

Mainstreaming sustainable livelihoods approaches in the field

FAO designs resource management projects worth more than US\$1.5 billion per year. Since smallholder agriculture continues to be the main livelihood source for most of the world's poor, if some of these projects could be improved, the potential impact could be substantial.

Sustainable Livelihoods Referral and Response Facility

A Referral and Response Facility has been established to respond to the increasing number of requests from within FAO for assistance on integrating sustainable livelihood and people-centred approaches into both new and existing programmes and activities.

For further information on the Livelihood Support Programme,
contact the programme coordinator:
Email: LSP@fao.org

LSP WORKING PAPERS to June 2004

- Baumann P., (July 2002) **Improving Access to Natural Resources for the Rural Poor: A critical analysis of central concepts and emerging trends from a sustainable livelihoods perspective.** FAO, LSP WP 1, Access to Natural Resources Sub-Programme.
- Cotula L., (August 2002) **Improving Access to Natural Resources for the Rural Poor: The experience of FAO and of other key organisations from a sustainable livelihoods perspective.** FAO, LSP WP 2, Access to Natural Resources Sub-Programme.
- Karl M., (August 2002) **Participatory Policy Reform from a Sustainable Livelihoods Perspective: Review of concepts and practical experiences.** FAO, LSP WP 3, Participation, Policy and Local Governance Sub-Programme. Also available in Spanish and French.
- Warren P., (December 2002) **Livelihoods Diversification and Enterprise Development: An initial exploration of Concepts and Issues.** FAO, LSP WP 4, Livelihoods Diversification and Enterprise Development Sub-Programme.
- Cleary D., with contributions from Pari Baumann, Marta Bruno, Ximena Flores and Patrizio Warren (September 2003) **People-Centred Approaches: A brief literature review and comparison of types.** FAO, LSP WP 5, People-Centered Approaches in Different Cultural Contexts Sub-Programme. Also available in Spanish and French.
- Seshia S. with Scoones I., Environment Group, Institute of Development Studies, University of Sussex, UK (November 2003) **Understanding Access to Seeds and Plant Genetic Resources. What Can a Livelihoods Perspective Offer?** FAO, LSP WP 6, Access to Natural Resources Sub-Programme.
- Biggs S. D., and Messerschmidt D., (December 2003) **The Culture of Access to Mountain Natural Resources: Policy, Processes and Practices.** FAO, LSP WP 7, Access to Natural Resources Sub-Programme.
- Evrard O., (Janvier 2004) **La mise en oeuvre de la réforme foncière au Laos : Impacts sociaux et effets sur les conditions de vie en milieu rural** (with summary in English). FAO, LSP WP 8, Access to Natural Resources Sub-Programme.
- Ellis F., Allison E., Overseas Development Group, University of Anglia, UK (January 2004) **Livelihood Diversification and Natural Resource Access.** FAO, LSP WP 9, Access to Natural Resources Sub-Programme, Livelihood Diversification and Enterprise Development Sub-Programme.
- Hodgson S., (March 2004) **Land and Water – the rights interface.** FAO, LSP WP 10, Access to Natural Resources Sub-Programme.
- Mitchell R. and Hanstad T., Rural Development Institute (RDI), USA, (March 2004) **Small homegarden plots and sustainable livelihoods for the poor.** FAO LSP WP 11, Access to Natural Resources Sub-Programme.
- Hanstad T., Nielsen R., Brown J., Rural Development Institute (RDI), USA, (May 2004) **Land and Livelihoods: Making land rights real for India's rural poor.** FAO LSP WP 12, Access to Natural Resources Sub-Programme.
- Fisher R.J., Schmidt K., Steenhof B. and Akenshaev N., (May 2004) **Poverty and forestry : A case study of Kyrgyzstan with reference to other countries in West and Central Asia.** FAO LSP WP 13, Access to Natural Resources Sub-Programme.