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World Institute for Development
Economics Research

Research Paper No. 2006/69

Gender, Local Knowledge, and Lessons Learnt in Documenting and Conserving Agrobiodiversity

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June 2006

Abstract

This paper explores the linkages between gender, local knowledge systems and agrobiodiversity for food security by using the case study of LinKS, a regional FAO project in Mozambique, Swaziland, Zimbabwe and Tanzania over a period of eight years and now concluded. The project aimed to raise awareness on how rural men and women use and manage agrobiodiversity, and to promote the importance of local knowledge for food security and sustainable agrobiodiversity at local, institutional and policy levels by working with a diverse range of stakeholders to strengthen their ability to recognize and value farmers' knowledge and to use gender-sensitive and participatory approaches in their work. This was done through three key activities: capacity building, research and communication. The results of the LinKS study show clearly that men and women farmers hold very specific local knowledge about the plants and animals they manage. Local knowledge, gender and agrobiodiversity are closely interrelated. If one of these elements is threatened, the risk of losing agrobiodiversity increases,

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Keywords: gender, biodiversity, agrobiodiversity, indigenous knowledge, conservation, sustainable management, genetic resources, participation, livelihoods

JEL classification: O13, O15, O17, O19, Q56, Q57

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This paper was prepared for the UNU-WIDER project on Hunger and Food Security: New Challenges and New Opportunities, directed by Basudeb Guha-Khasnobis. The project was carried out in collaboration with the Indian Council of Social Science Research (ICSSR) and the Food and Agriculture Organization of the United Nations (FAO).

UNU-WIDER acknowledges the financial contributions to its research programme by the governments of Denmark (Royal Ministry of Foreign Affairs), Finland (Ministry for Foreign Affairs), Norway (Royal Ministry of Foreign Affairs), Sweden (Swedish International Development Cooperation Agency—Sida) and the United Kingdom (Department for International Development).

ISSN 1810-2611

ISBN 92-9190-843-6 (internet version)

having negative effects on food security. Increased productivity, economic growth and agricultural productivity are important elements in poverty reduction. The diverse and complex agroecological environment of Sub-Saharan Africa requires that future efforts be based on more localized solutions while maintaining a global outlook. Food security will have to build much more on local knowledge and agrobiodiversity with a clear understanding of gender implications while keeping in mind the continuously changing global socioeconomic and political conditions.

Acronyms

Acronyms are given at the end of the paper.

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Camera-ready typescript prepared by Liisa Roponen at UNU-WIDER

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1 Introduction

1.1 Biodiversity: achievements and challenges ahead

There is growing worldwide realization that safeguarding the planet's biodiversity is fundamental for agricultural production, food security, and environmental conservation. Genetic resources, because of their diversity, are the cornerstone of sustainable development, as they offer the building-blocks needed to adapt to changing environments and challenges, such as climatic change and increased human pressure on the available natural resources (Gladis 2003). Many subsistence farmers, especially in environments where high-yielding crop and livestock varieties do not prosper, rely on a wide range of crop and livestock types. This diversity, however, is disappearing at an alarming rate and 75 per cent of today's food is generated from just 12 plants and five animal species. Only 200 out of 10,000 edible plant species are used by humans, and only three plants—rice, maize and wheat—contribute nearly 60 per cent of the calories and proteins obtained by humans from plants. Since the 1900s, farmers have replaced their many well-adapted local crop varieties and land races with genetically uniform, high-yield varieties. Consequently, the small scale and diverse food production systems that conserve crop varieties and animal breeds have been marginalized. Genetic erosion is one of the most alarming threats to world food security. Biodiversity is the arbiter of the quality of human life, and the risk of species loss (Groombridge and Jenkins 2002), undermines the very sense of 'sustainable development', limits options of the future and robs humanity of a key resourcebase for survival.

To limit this loss and consequent destruction of natural habitats, farming and land management techniques should be tailored to increase agricultural productivity while conserving what is left of wild biodiversity. Agricultural policies must change and further action from a range of sectors is needed in the areas of research, public education, development of markets, creation of incentives, implementation of local projects, and investment in ecoagriculture. Special attention should be given to impoverished areas of the biodiversity-rich tropics (McNeely, Jeffrey and Scherr 2001). To confront the erosion of genetic diversity, Thrupp (2000) proposes the diversification of sustainable agriculture, the use of participatory approaches and building complementarity between agrobiodiversity and habitat conservation in underlying policies.

The three 'Rio Conventions' on biodiversity, climate change and desertification came into existence to highlight the fact that livelihoods and human wellbeing, especially for the poor, are directly threatened by the loss of biodiversity, climate change and increasing desertification. The fundamental interaction between poverty alleviation and biodiversity conservation has already been highlighted in a study by Adams *et al.* (2004) who stress that the Millennium Development Goal (MDG) of environmental sustainability should not be separated from the goal on poverty and reduction of hunger.

The numerous and complex interlinkages between global and local climate, natural habitats and land degradation impact on the rural poor more severely, as they are largely dependent on natural resources for their food security and livelihood. At the global level, deforestation, land degradation and desertification contribute directly to

increasing carbon dioxide concentration in the atmosphere; reducing the vegetative cover and impairing the water retention capacity of the soil, and the ability of vegetation to store carbon. Locally, deforestation increases soil erosion, causing a reduction in soil fertility and agricultural productivity. Since forests are the habitat of a large number of species, their degradation results in a direct loss of biodiversity. Land degradation is also a major cause of food insecurity (OECD-DAC 2001; Lambrou and Laub 2004).

The loss of both wild and domestic plant as well as animal genetic diversity poses a serious threat to long-term food security. One main threat to the conservation of local farm animal populations appears to be uncontrolled crossbreeding (Wollny 2003). The maintenance of genetic variation while minimizing counterproductive effects of livestock production on the environment is viewed as a pragmatic and sustainable strategy option, as are the removal of negative economic incentives, improved planning and controlled crossbreeding. A policy promoting decentralized community-based management and full stakeholder participation would alleviate further erosion of the animal genetic diversity.

Biodiversity is critical for minimizing risks in securing rural livelihoods. The reliance of rural women and men on a variety of genetic sources allows them to adapt their agricultural systems to varying environmental, economic and social conditions. It also provides them with a broader income generation possibilities from a wide range of natural resources.

Environmental change challenges the traditional coping and risk-sharing mechanisms based on kin and social groups. If the natural resourcebase is degraded to the point of being insufficient to support the population, drastic measures for ensuring livelihood such as the selling off assets or rural-urban migration are implemented.

1.2 Gender and sustainable development

Given the close relationship between desertification, biodiversity erosion and poverty, a gender-sensitive understanding of livelihood roles at the local level is all the more relevant in devising solutions. Women, men, boys and girls perform different tasks that may have direct or indirect effects on the erosion of biodiversity, land quality and water availability. Whatever their roles, the specific targeting of gender and age groups in the assessment of needs, solution design and implementation is an essential factor of programme success. The depletion of natural resources and decreasing agricultural productivity may place an additional burden on women's work and health as they struggle to seek their livelihood in a changing environment. Combined with other pressures, this struggle may subsequently further reduce the time available for women to participate in decisionmaking processes and income generating activities. Furthermore, climate-related disasters impact more intensely on female-headed households because women generally lack access to, and control over, natural and productive resources (World Bank 2003a).

Women's participation in biodiversity-related decisionmaking processes remains limited despite widespread acknowledgement of its importance at the international level. Major obstacles include the lack of secure access to land, adverse financial

conditions, public policy traditionally focused on the male population as heads of households, and a strict gender division based along sociocultural norms (Deda and Rubian 2004).

Local-level biodiversity and environmental integrity are maintained through the long acquired knowledge and experience of both women and men. Such knowledge pertains to domestic plant and animal genetic resources as well as to the quality of soil and water, which form the basis for both the productivity and adaptability of agricultural systems. Wild and semi-domesticated sources offer safety nets in case of food scarcity.

Failure to target both genders in biodiversity conservation and agricultural and rural development initiatives inevitably leads to a loss of knowledge (at local and international levels), and produces a gender bias in policies and programmes (Howard 2003) which may be detrimental to the functions performed by women. Thus, it is important to empower women and promote an equitable and fair distribution of the benefits and uses of biodiversity (Villalobos *et al.* 2004).

Clearly, climate change, desertification, and biodiversity erosion have many common causes, and share many elements in terms of adaptation strategies deployed at the individual and policy level. To address the challenges set out at Beijing (1995, 2005) and other international conferences (Cairo, Copenhagen), and to meet the targets embodied in the MDGs, it is crucial to address gender issues in the context of natural resource use and management, particularly as they relate to biodiversity, desertification, and climate change.

Gender equality is vital for achieving all of the MDGs (Grown, Rao Gupta and Kes 2005). Women's empowerment should be at the centre of development, as they carry the brunt of supporting and caring for families and sustaining life. Practical policies and effective actions should include (i) guaranteed universal access to sexual and reproductive healthcare and rights; (ii) investments in infrastructure to reduce the time and work load of women; (iii) guaranteed property and inheritance rights for women; (iv) elimination of gender gaps in employment and wages; (v) increased political participation for women; and, (vi) combating violence against women. A human rights approach is central to development, with the MDGs and gender mainstreaming as the strategies for achieving human rights (Painter 2004).

1.3 The international framework

To analyse the root causes of failed development, UNDP (2003) has examined the structural constraints that impede economic growth and human development, and proposes a policy approach to achieving the MDGs that starts by addressing such constraints. The report proposes more effective aid, new approaches to debt relief, expanded market access to enable diversification and trade expansion, better access to the outputs of global technological progress, follow-through on commitments and setting new targets. Although most solutions to hunger, disease, poverty and lack of education are well known, efforts for their elimination need to be given the proper resources, and services need to be distributed more fairly and efficiently.

Similarly, Oxfam International (2005) called on donors and governments at the 2005 G8 Summit, the UN Millennium Development Goals Special Summit and the World Trade Organization ministerial conference to eradicate global poverty. Oxfam states that the failure to meet the MDGs will cost millions of lives, and failure is in part due to a reduction in the proportion of national spending earmarked to international aid over the past forty years. Oxfam urges world governments to draw up a millennium plan with binding commitments to reform the international trade rules through the cancellation of the debt owed by poor countries, increased volume and effectiveness of aid, to be followed by urgent and concerted action to ensure that commitments are acted upon.

Of particular interest in this regard is the FAO annual report, the *State of Food Insecurity in the World* (FAO/SOFI). FAO/SOFI (2004) focuses on monitoring the progress towards the World Food Summit (WFS) and MDGs. According to the report, the number of chronically hungry people in the developing world had fallen by only nine million since the WFS baseline period of 1990-92. The WFS Summit goal to halve the number of hungry people by the year 2015 was not only achievable, but also made economic sense. By focussing on simple, low-cost, targeted actions over the next ten years, FAO/SOFI outlines how the resources needed to effectively address food insecurity are very small in comparison to the costs of dealing with the damage caused by hunger. Two parallel strategies are highlighted: (i) intervention to improve food availability and income of the poor by enhancing their productive activities, and (ii) targeted programmes that give direct and immediate access to food to the neediest. SOFI also examines the effect that the rapid growth of cities and incomes in the developing countries and the globalization of the food industry have had on hunger, food security and nutrition.

The interventions and policy measures needed to reduce hunger by half by 2015 have already been identified in a study by Sanchez *et al.* (2005). Concrete steps are proposed in several key areas: (i) investments to improve the agricultural production of food-insecure farmers; (ii) improvements to the nutritional status of the chronically hungry and vulnerable; (iii) investments in productive safety nets; (iv) promotion of rural markets and off-farm employment for increased income; and (v) preservation and conservation of the natural resources essential for food security.

Von Braun, Swaminathan and Rosegrant (2004) suggest that since the majority of poor people rely on agriculture for economic growth, agricultural and rural development is essential to achieve the MDGs economic and social indicators. Strategies should be context-specific, with due consideration to political and economic climate and policy actions, and should create efficient public-private partnerships. Coordination between levels will insure that resources are allotted effectively, and that a sense of ownership is developed with all partners. Nutrition-focused interventions, good governance, and efforts towards peace in conflict-ridden areas must supplement economic growth. Policy action in the critical areas of sustainable agriculture and food nutrition and security is essential for responding effectively and responsibly towards reaching the MDGs (Von Braun, Swaminathan and Rosegrant 2004).

Kameri-Mbote (2004) examines the implications of international agreements on land and resource rights as they relate to access, control and ownership. He points to

agreements that have promoted as well as hindered enjoyment of land and resource rights at different levels, with particular attention to the Convention on Biological Diversity (CBD). The CBD is riddled with contradictions as it tries to accommodate access to resources that must be shared equitably between developed and developing countries. Kameri-Mbote concludes with an examination of the wider context, and highlights the Pan-African Programme on Land and Resource Rights as a way to optimize the benefits of international agreements in realizing land and resource rights for the poor.

With regards to the issue of environment and sustainable livelihood, literature discusses the implications and constraints for sustainable development. Spangenberg (2002) examines sustainability indicators, recommending the inclusion of gender issues, labour, the environment and economy, and peace. Dovie (2002) investigates the link between Agenda 21 and sustainable livelihoods, pointing out that institutions implementing Agenda 21-related activities have often concentrated on economic development at the expense of the environment and poverty reduction in the south. Barber (2003) analyses the elimination of unsustainable production and consumption as one of the three objectives of sustainable development debated at the World Summit on Sustainable Development (WSSD). A global strategy to achieve sustainable production and consumption would come not from a UN consensus of world leaders, but rather through the strategic alliance of responsible governments, civil society and others with a vision beyond the next election cycle.

The International Treaty on Plant Genetic Resources (ITPGR) for Food and Agriculture has generated an interesting discussion. Fowler (2004) looks at the Multilateral System of the International Treaty on Plant Genetic Resources for Food and Agriculture (PGRFA), and analyses the key ambiguities and problems in the text. Details cover the status, scope, major provisions of the PGRFA, the multilateral system and crops, and the relevance of Consultative Group on International Agricultural Research (CGIAR) collections. Ambiguities, on the other hand, include the lack of definitions of important terminology; the Treaty's exemption for facilitated access to material 'under development'; the lack of specificity for benefit-sharing provisions; and stipulation of responsibilities by governments towards PGRFA. Although the Treaty provides a formal framework that clarifies many issues on sustainable agriculture, the issue of farmers' rights is side-stepped, leaving further clarification to individual nations. Despite its potential shortcomings, the Treaty provides a medium in which trust can grow, and implementation must be considered. Cooper (2002) also analyses the main features of the ITPGR, reviewing some of the key negotiation issues and its relationship to the CBD.

1.4 Local partnership

Roe (2004) looks at poverty, environment and the achievement of the MDGs through an integrated approach to conservation and development. He argues that ecosystems have to remain intact as a basic human requirement, and that communities and local partnerships are a vital force to sustainable development. He emphasizes increased awareness amongst development agencies about the importance of conservation, by recognizing and strengthening the comparative advantage that biodiversity offers to many poor countries. A shift in the focus of international conservation policy—from

looking primarily at rare and endangered species towards emphasizing the development values of biodiversity and landscape management approaches—is necessary.

The management of local resources has a greater chance of achieving a sustainable outcome when a partnership exists between the local people and external agencies. (Pound *et al.* 2003). As indicated in the participatory approach, in order to improve natural resources management, it is necessary to incorporate participatory and user-focused approaches that lead to a development model based on the needs and knowledge of local resource users. Such an approach is also recommended by Ramírez and Quarry (2004), who draw particular attention to the importance of exchanging knowledge and information, and developing awareness.

Laird (2000) offers practical guidance on conducting equitable biodiversity research and prospecting partnerships. These recommendations include developing research codes of ethics, designing effective commercial partnerships and biodiversity prospecting contracts, and drafting and implementing national ‘access and benefit-sharing’ laws, combined with institutional tools for the distribution of financial benefits.

Calderón (2004) points to the need to move beyond the top-down charity approach and project development models to models that are based on collaborative action for social change. The value of participatory research—utilizing traditional farmer knowledge—has already been highlighted by Goma *et al.* (2001) in a discussion on the relevance of an interactive farmer-researcher process.

Participatory research is expected to improve the efficiency, equity, and sustainability of natural resource management research and development (R&D) projects by ensuring that research reflects users’ priorities, needs, capabilities and constraints. Particular attention should be given to contributions from women and other marginalized groups (Johnson *et al.* 2004).

Community-based, participatory and co-management processes are often slower and more complex than traditional bureaucratic or technical project implementation, however, participation and at least partial control over the process from research to implementation and beyond is seen as central to an effective empowerment strategy (Simon *et al.* 2003).

Vernooy (2003) encourages collaboration between researchers and farmers, as participatory plant breeding is instrumental for the development of plant varieties that truly meet farmers’ needs. He examines research questions, the design of on-farm research on the rights of farmers and plant breeders, and argues for the development of new supportive policies and legislation. Vernooy recommends action to ensure that participatory plant breeding achieve the intended results. Maier (2002) calls for an international convention and treaty on livestock genetic resources to establish legal recognition of the rights of pastoralists and livestock keepers.

Investment in research is thus crucial. However, in the last decade or so, there has been a decline of public investments for research, especially in Africa, and funding has become more donor dependent. Although the efficacy of donor-supported projects

has helped to build capacity in many countries, advances can be quickly eroded if donor funding is withdrawn and other sources are not consolidated or developed further (Beintema, Nienke and Stads 2004).

1.5 Farmers' rights

Borowiak (2004) examines the rights of farmers as a resistance strategy against the perceived inequities of intellectual property rights regimes for plant varieties. The campaign to legitimize the traditional seed-saving practices of the farmers alongside the increasingly commercial models of intellectual property in agriculture had mixed implications. Borowiak admits that this campaign could help transform conventions of intellectual property to become better suited for registering and for providing financial encouragement to alternative forms of innovation. However, the enactment of farmers' rights has been difficult. By comparing the rights of farmers to those of commercial breeders, Borowiak cautions that the campaign risks further legitimization of inequities, favouring the interests of the seed industry to the detriment of the farmers.

Srinivasan (2003) examines the feasibility of the provisions on farmers' rights in plant variety protection legislation. He argues that the provisions by some developing countries will involve substantial operational challenges. IPR-based farmers' rights are unlikely to provide significant economic benefits to farmers and their communities, as these are not likely to diminish the incentives provided to institutional plant breeders. Indian plant variety protection (PVP) legislation is used as an example, as this appeared to have gone quite far in articulating the provisions on farmers' rights. Conservation projects supported by community gene funds are a more efficient way to preserve agrobiodiversity than extending the IPR regime to farmers' traditional varieties. He cautions that the resources recuperated from breeders' IPR research may not be adequate to realistically fund this strategy.

Similarly, Brush (2005) questions the significance of bioprospecting in protecting traditional agricultural knowledge and argues for a common pool approach with genetic resources remaining in the public domain. Brush examines the nature of crop genetic resources, farmers' knowledge, and the nature of the 'common heritage' regime that was being partly dismantled by the CBD. He reviews the implementation of access and benefit-sharing schemes under the CBD and discusses programmes to recognize farmers' rights that have arisen since the establishment of the Convention. He argues for increased development assistance to be focussed on programmes for improving rural income in genetically diverse farming systems. The challenge to establish farmers' rights should follow from the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) and India's Act 53 which emphasize multi-community solutions rather than individual contracts for accessing crop resources and sharing benefits from their use.

1.6 Local knowledge

Although traditional farming systems are diminishing worldwide, their role remains crucial for maintaining community food security and for conserving agrobiodiversity,

as well as for the design of more sustainable agroecosystems appropriate for small farmers (Altieri 2004).

With particular regard to natural resources management, the conventional ‘indigenous knowledge’ approach shows that shortcomings can be circumvented through a subset approach called ‘traditional ecological knowledge’, which adds an explicit *ecological* emphasis to the conventional development method (Dudgeon and Berkes 2003).

UNESCO (2002) points out that insufficient attention has been paid to the relationship between indigenous knowledge and power, and they advocate increased attention to be focused on the context within which indigenous peoples live. Particular attention should be paid to political relations. It is important to develop a relationship between the scientific community and the holders of traditional knowledge. This calls for a more equitable partnership that fully respects indigenous peoples, their territories, and self determination (ISCU 2002).

Until the CBD recognizes the existence of indigenous peoples and the rights of indigenous peoples as set out under international law, the promise of the Convention is likely to remain unfulfilled (Oldham 2002). Ruiz (2004) discusses traditional knowledge as a tool which enables the countries of origin to assert their rights over their genetic resources, to benefit from such resources in an equitable manner and to protect indigenous peoples’ intellectual efforts.

Some authors discuss local knowledge from the seed systems’ view. Tripp (2000) analyses the inability of formal African seed systems to meet farmers’ needs and suggests that such systems could be strengthened in countries such as Kenya, Malawi, Zambia and Zimbabwe by considering the nature of seed demand, provision, and emergency distribution programmes, as well as policy and regulatory frameworks, and the role of public sector research. He recommends that precise national strategies be developed, and a sustainable seed system be created as a combined effort of public, commercial and local-level stakeholders. He recommends seed policy reform in much of Sub-Saharan Africa. Similarly, Louwaars (2000) points to the risk of introducing seeds regulations which are often inappropriate for the local informal seed systems that have taken generations to evolve. Such regulations could restrict informal seed systems and in some cases the initiatives by local farmers could be construed as illegal, limiting recognition and reward from these systems.

1.7 HIV/AIDS, food security and biodiversity

Gillespie *et al.* (2001) examine how HIV/AIDS affects nutrition, food security, and household livelihoods, and those dependent on agriculture. They discuss mitigation as the primary public sector response to these challenges, suggesting that key generic public policy and programming principles should include ‘doing no harm’. These authors suggest mainstreaming HIV/AIDS concerns into food and nutrition programming, with due consideration to scale, context, targeting, monitoring and collaboration. They conclude with a call to re-examine policy.

Jayne *et al.* (2004) propose modifications to existing agricultural policies and programmes for better achievement of policy objectives in the context of the

HIV/AIDS epidemic in eastern and southern Africa. The effects of the epidemic are likely to affect the agricultural sector in numerous ways, increasing the cost of labour and scarcity of capital. They suggest improvements to technical capacity; rehabilitation of agricultural extension services and institutions for the crop and input marketing systems that contribute to small-scale farmers' productivity and food security.

Kengni *et al.* (2004) examine the potential of forests to provide food security for resource-poor rural families against the socioeconomic impact and livelihood threats from HIV/AIDS. They analyse the role of local food-based approaches in rural communities where short- and long-term goals are maintained and food security needs are met while preserving the natural resource base and conserving indigenous fruit and vegetable species. According to the study, wild foods can be cheap, nutritious, and economically beneficial, and their production can be less labour-intensive. Kengni *et al.* conclude that wild foods may provide an alternative to the food shortages and income problems caused by HIV/AIDS if existing added-value technologies are improved and made available to the farmers at low cost.

Barany *et al.* (2001) highlight the contribution of forests to household nutrition and health. They draw attention to the gap in literature on the importance of forest-based research in connection with coping strategies for mitigating the socioeconomic impact of HIV/AIDS on rural agrarian households. The strong traditional dependence of local people on forest resources for health and nutrition could be made compatible to agroforestry systems by taking into consideration the productive challenges associated with low household labour supplies.

Gari (2002) explores the strategic components of the agricultural sector's response to food insecurity and the impact of HIV/AIDS on rural development in Sub-Saharan Africa. He discusses agrobiodiversity and its close relationship to indigenous knowledge as well as their often overlooked albeit important roles in enhancing food security in rural communities affected by the epidemic. He states that the promotion of agrobiodiversity and indigenous knowledge represents a renewed emphasis on local resources and the ability to strengthen agriculture, food and health. Gari recommends immediate and urgent participatory and grassroots-oriented research and action.

McMichael (2004), on the other hand, traces the history of the emergence of new or unfamiliar infectious diseases, HIV/AIDS included. The rise of modern medicine and other rapid changes in demography, environment, behaviour and technology in the human ecological system have contributed also to a rise in biodiversity. He urges for greater understanding of the dynamic process of viruses and diversity in order to anticipate an amoral, self-interested co-evolutionary struggle. Such an understanding can influence environmental management, poverty alleviation, help to reduce susceptibility to disease, foster social capital, and limit ecological damage arising from consumer or commercial incentives, as well as restore society's public health capacity and function.

1.8 FAO and the global challenge

The particular role of FAO in the establishment and management of the plant genetic resources for food and agriculture is examined by Andersen (2003). He reviews the main achievements and limitations, with particular focus on the FAO's Commission on Genetic Resources for Food and Agriculture (CGRFA). He examines the CGRFA and its role in the implementation of the International Treaty on Plant Genetic Resources for Food and Agriculture (2001). FAO plays an important agenda-setting function with regards to the sharing of genetic resources and information at the international level, providing an arena for discussion. With strong political support for implementation and funding, the PGRFA can be one of the key elements in halting genetic erosion and providing access to the remaining genetic resources essential for future food security.

Box 1
**Incorporating gender-sensitive approaches into
plant genetic resources conservation**
A Global Workshop

In October 1996, in partnership with the International Plant Genetic Research Institute (IPGRI), FAO brought together various experts focusing on gender and agriculture as well as experts from plant genetic resources to address gender concerns in relevant international policy frameworks and agreements on plant genetic resources (PGR) and the implications for rural women and PGR.

Because of its mandate, FAO has long been involved in assessing and addressing environmental and natural resources issues, the interactions between people and the resources around them, and the interlinkages between gender, poverty, agriculture and food security. FAO's current gender and development plan of action specifically recognizes natural resources as a priority area for

gender mainstreaming. FAO has long recognized the strong linkages between the gendered knowledge and skills and biodiversity so critical to agricultural production and food security, and has supported various initiatives to this end in Asia, Africa, and Latin America. Given its mandate within the UN system for food and agriculture, it has an important role to play also at the level of international policy. To this end, much support was provided through the 1990s to make sure that gender remained on the international agenda, particularly in arenas such as the Commission on Genetic Resources for Food and Agriculture (CGRFA); particular attention was given to the gendered dimension of farmers' rights.

Through its many initiatives, FAO has reaffirmed that in order to promote and ensure sustainable use of resources and sustainable agricultural development, it is crucial to begin any agricultural planning or policy development process with a gender-sensitive participatory identification of the issues. Following on this, FAO has provided support to member nations in the design of agricultural policy in the effort to promote more gender equitable development. Furthermore, FAO has also extensively supported training efforts in member nations to increase the capacity of national partners to undertake agricultural initiatives in ways that support more sustainable practices through gender-sensitive participatory assessments and development.

Recently, FAO undertook a study to assess the gendered dimensions of the three Rio Conventions on biodiversity, climate change, and desertification (Lambrou and Laub 2004). In 2005, it also produced a paper that considers gender as the missing component of the response to climate change (see Piana and Lambrou 2005). These

efforts contribute to the international debate of the three environmental conventions. FAO has raised the profile of the link between gender equality and several natural resource concerns related to dryland management, freshwater use, land tenure and property rights, and the need for gender-sensitive indicators at several levels—from the national to the project level—to monitor progress towards sustainable use of natural resources.

2 FAO project case study: gender, biodiversity and local knowledge for food security

The FAO regional project ‘Gender, Biodiversity and Local Knowledge for Food Security’ evolved because of the growing interest and recognition that rural men and women have in-depth knowledge and understanding of local ecosystems and environmental processes. The aim of the LinKS project was to improve rural people’s food security and promote sustainable management of agrobiodiversity by strengthening the capacity of institutions to utilize in their programme and policies participatory approaches that recognize the knowledge of male and female farmers. This section of the paper highlights some of the project’s experiences with the participatory approaches to improve people’s livelihoods in the long term.

First, the international context of the project is presented to show how it tried to respond to debate and issues at the global level. Second, there is a brief presentation of the project and its activities. Project accomplishments and challenges are then described, as are the project responses to the challenges it faced. Finally the way forward after the conclusion of the project is described.

2.1 Why this project?

The international context

The LinKS project was conceived during 1994-96. In the early 1990s, important international debates focused on the sustainable management of natural resources, biodiversity and participatory approaches. The LinKS’s conceptual framework clearly reflects these issues.

In the period leading up to 1996, the understanding of gender, local knowledge systems and the rich source of information embodied in the knowledge, skills and practices of women as managers and users of diversity was not very clear. During the International Technical Conference on Plant Genetic Resources for Food and Agriculture held in Leipzig in 1996, these issues were given greater importance than during the formulation process of the CBD and the Agenda 21 (1992). The CBD addressed the issue of local knowledge in two Articles, 8(j) and 10(c). However, both articles were relatively vague. The Leipzig conference approved the Global Plan of Action which sets the stage for the development of mechanisms and programmes to be carried out at policy, institutional and community levels to ensure the conservation and sustainable use of plant genetic resources. It also highlights the importance of men and women farmers and their role and contribution to the sustainable management of plant genetic resources.

A joint workshop organized by IPGRI (International Plant Genetic Resources Institute) and FAO on how to incorporate gender-sensitive approaches in the conservation and utilization of plant genetic resources was organized after the Leipzig conference. This workshop was one of the first attempts after Leipzig to link policy with practical activity in the field, activity in which women farmers and resource managers play a crucial role.

After extensive negotiations, the International Treaty on Plant Genetic Resources (ITPGR) became effective in June 2004. The ITPGR, responding to outstanding issues not covered by the CBD, was an important breakthrough, as it formally endorses farmers' rights through a legally binding instrument at the global level. Farmers' rights, based on the recognition that farmers play a crucial role in the management and conservation of plant genetic resources, include the protection of traditional knowledge, participatory decisionmaking and the right to equitable participation in sharing the benefits arising from the utilization of plant genetic resources for food and agriculture.

In recent years there has been a proliferation of international fora considering different aspects of the protection of the technology and knowledge of indigenous people and local communities. The following discussion demonstrates how the project responded to the discussions, international conventions and treaties.

The LinKS project

The LinKS project evolved because of the growing conviction that rural men and women have detailed knowledge and understanding of local ecosystems and environmental processes. Furthermore, rural people's traditional practices and knowledge systems are at risk of being marginalized and lost. Thus, the project's goal was to increase among development practitioners the understanding of the value of this knowledge base—and how it can be applied to support valid systems of managing the environment, farming and producing food—for the ultimate benefit of men and women farmers. To achieve its goal, the project initiated and supported partner organizations' activities in three major areas: (i) capacity-building; (ii) research and documentation, and (iii) communication and policy debate.

There is a great overlap between these components, and the activities represent a set of interactive, inter-related and mutually reinforcing processes of support to partner organizations. The project sought to explore these issues with a diverse group of organizations and individuals in four countries in the Southern African Development Community: Tanzania, Zimbabwe, Mozambique and Swaziland. The main strategy of the project was to support, build on, and strengthen the efforts of other groups already working on food security, indigenous knowledge and agrobiodiversity issues in the four countries. These included NGOs, research, training and academic institutions, and government agencies and policy institutions. The project focus was participatory, which meant that project teams and management promoted participatory principles and approaches in actual project management as well as in its activities.

The following sections describe the accomplishments of the project and summarize the important lessons learned from project implementation.

3 Accomplishments of the project

The first activities within the project began in 1997 in Zimbabwe and Tanzania in two phases: 1997-2002 and from 2002 to September 2005. A stakeholder analysis was carried out in each country, which revealed that partners and important actors in the agricultural sector lacked a common understanding of the issues of gender, biodiversity and local knowledge, and how these relate to food security. Partners hoped that the project could provide opportunities for learning about the issues. Thus as a preliminary step, strong focus was put on raising awareness and strengthening capacity among development practitioners in order to meet the project's ultimate goal of promoting approaches that recognize the importance of men and women farmers' knowledge for the sustainable management of agrobiodiversity and enhanced food security.

3.1 Capacity-building

LinKS placed a strong focus on institutionalization and the uptake of gender-sensitive and participatory approaches to biodiversity conservation in institutions' on-going programmes. Priority was given to institutions that were able to apply these approaches in their programmes targeted towards rural men and women farmers. This included agricultural extension services, development projects, NGOs and institutions of higher learning.

Several workshops were organized to document traditional practices and to address the main challenges and constraints. Two main issues were emphasized: first, the potential benefits and risks of sharing such knowledge, and second, the responsibilities of researchers and development agents to record and document local knowledge. An attempt was made to develop a set of simple basic guidelines for all involved in the documenting and sharing of local knowledge (FAO 2000: 7).

FAO carried out several missions to Swaziland to meet various potential project partner institutions, as well as government agencies and civil society organizations to assess the needs and interests of a diverse group of Swazi partners for intensifying activities in the country. After initial consultation and exploratory period, it was concluded that there were already various local initiatives addressing the issue of local knowledge for food security, biodiversity management and integration of gender concerns in agriculture sector. Thus, it was recognized that the time was ripe to broaden project activities to support such local initiatives. Several specific training workshops were organized, and these attracted considerable interest from different organizations.

The main objective was to strengthen knowledge and skills in implementing gender-sensitive participatory agricultural/livestock research and training so that local knowledge systems in agrobiodiversity management for food security would be understood by all participants.¹

¹ See documentation of the 9th LinKS training workshop (FAO 2005).

Other workshops were also held that sought to strengthen knowledge and skills in implementing gender-sensitive research to agriculture/livestock so as to better understand the vital role played by local knowledge systems in agrobiodiversity management for food security. The team in Tanzania learned how to improve and strengthen the capacity-building component of the project; how to enhance the capability of participants in collecting, documenting and sharing local knowledge related to agrobiodiversity conservation and food security within the framework of their institutions; and were provided insights on the preparation of draft guidelines for the documentation of local knowledge (FAO 2005). Some other relevant capacity-building activities covered:

- 1125 people participating in the training workshops on gender, local knowledge and biodiversity and the application of gender analysis and participatory methods. More than 830 people enhanced their understanding of the relationship between gender, local knowledge and biodiversity as well as of national and international policy frameworks by taking part in seventeen project-supported thematic workshops and seminars. Most of the participants were involved in research on LinKS issues, enabling them to further enhance their skills and understanding.
- A training manual, *Building on Local Knowledge, Gender and Biodiversity*, was developed, highlighting the specific concepts and links between these issues from the perspective of a sustainable livelihoods: see www.fao.org/sd/LINKS/documents_download/Manual.pdf.
- A local pool of experienced and well trained trainers was built up, to facilitate with the training workshops on LinKS issues and gender-sensitive participatory approaches.
- Redesign of the existing curriculum was undertaken, through project support, to mainstream and institutionalize LinKS issues in training colleges, universities and other institutions of higher learning. FAO supported the workshops on mainstreaming LinKS issues at the Sokoine University of Agriculture. Visits were organized to provide farmers, researchers, NGO representatives and development workers with an opportunity to exchange ideas and experiences, and to take part in mutual learning experiences. In Tanzania, for instance, as part of a research project focusing on the management of animal genetic resources by the Maasai, pastoralists from various study areas exchanged visits to share experiences and views.

3.2 Research

The main rationale for the support of research activities was to develop a better understanding of the linkages between LinKS issues, and to reinforce collaboration between researchers and rural communities; to demonstrate the complementarities between the local and scientific systems of knowledge, and to enhance the potential of developing approaches to increase food security and agrobiodiversity. Research activities were closely linked to capacity-building and advocacy, as they were seen to be mutually reinforcing. Government officers, researchers and NGO staff who

participated in the training and awareness workshops, often developed research proposals for increasing recognition of the knowledge of men and women, the documenting of experiences, for community-to-community exchanges, or for follow-up action. All research activities explored the hypothesis that women are important custodians of knowledge in the management of biodiversity.

The stakeholders identified three broad topics as particularly important: (i) traditional seed systems; (ii) animal production and genetic diversity, and (iii) the relation between HIV/AIDS and local knowledge systems.

In total, twenty-eight research activities focusing on gender, local knowledge and agrobiodiversity were implemented.

Traditional seed systems

Research activity on gender biodiversity was set up in the southern highlands of Tanzania, a region that has been heavily exposed to seed interventions, thus increasing the availability of improved varieties. The overall goal was to improve the availability and accessibility of high-quality seed of crop varieties preferred by farmers, thus enhancing household food security. At the end of the project, the following main findings were noted: (i) some crop species had disappeared due to changes in weather, migration, government policies and interventions, or farmers' preferences, but at the same time, many varieties with different characters had been introduced, increasing agrobiodiversity; (ii) in general, agrobiodiversity had increased over the years; (iii) levels of food consumption and their composition varied within the different socioeconomic groups; (iv) food-secure households relied more on staple food and less on natural and collected crops; (v) the informal system was a better source of seeds and information for many farmers than the formal seed system. In the Malinzanga and Shinji villages, HIV/AIDS had affected food and seed security in the afflicted households, because of diminishing labour, increasing number of dependants/orphans and weakening physical state due to the illness. The number of female-headed households in the villages affected by HIV/AIDS also increased (Mkuchu 2006).

Animal production and genetic diversity

In the Mbarali district, a study was conducted to gauge local knowledge on breeding and selection of livestock in the Maasai community, by examining the types of animals (cattle, sheep, goats) preferred and what were the criteria used to achieve the desired traits. These preferences were analysed in relation to gender and age, roles and responsibilities, decisionmaking, goals of food security and herd survival. The objective was to let the Maasai pastoralists identify the gaps and make corrections. The threats or constraints to the pastoralists' local knowledge for the sustainable management of indigenous livestock were identified, and possible solutions offered. The decreasing grazing land and water for livestock in Mbarali district, and livestock diseases were major constraints.

The relation between HIV/AIDS and local knowledge systems

A study on the impact of HIV/AIDS on local seed systems in both Tanzania and Mozambique showed that local knowledge is gender specific. Men and women are responsible for different crops; for example, a widower would not necessarily know

or be able to produce, after his wife's demise, the local crops she had planted. Her specific knowledge about local seed varieties would be lost. This means that HIV/AIDS constitutes a severe threat to agrobiodiversity. At the request of four communities in Tanzania, several local seed fairs were organized to enable farmers to share and exchange their local knowledge and local seed varieties.

A study in Swaziland looked at the relation between micronutrient intake and HIV/AIDS to establish an inventory of the indigenous foods found in the Manzini region. It also documented the methods of preparation for human consumption and medicinal purposes, according to preference by age, gender and socioeconomic status and farming practices. The study focussed on the issue of food insecurity, as underutilization of indigenous foods contributes to the problem. The seasonal availability of crops was examined so that the periods when specific foods are unavailable were easily identified. This information, also utilized as material for radio programmes and community workshops, was important for the government as well as international agencies planning intervention programmes (Hlanze, Gama and Mondalane 2005).

3.3 Communication

Communication was a component strategy of all project activities seeking to increase the visibility of men and women's knowledge among communities, development workers and policymakers. Communication at the rural community level was conducted through participatory research processes, encouraging dialogue, feedback to communities and follow-up action that further enhanced learning, and empowerment. The project also promoted communications at the intermediate and policy levels.

- 787 researchers, policymakers and development workers participated in workshops and seminars organized to raise awareness and facilitate discussion of the issues. Several small workshops focussed on exploring the issues of farmers' rights and intellectual property rights. Through these workshops, the project fostered discussion of local knowledge and its link to biodiversity conservation and food security in each of the project countries.
- A wide range of informative material was developed and disseminated. In total, 20 short case-studies, 33 research reports and two videos were disseminated to project partners through training workshops, seminars, and the LinKS project mailing list. The project also supported agricultural fairs, contributed to national television and radio programmes, national newspapers and specialist magazines. A website was set up (www.fao.org/sd/links/gebio.htm) to disseminate output and provide useful resources and links to information sources.

LinKS collaborated with the World Bank Indigenous Knowledge (IK) Programme to support a government-led effort in Tanzania to develop a national strategy for IK. As an important follow-up to the implementation of this strategy, a trust fund for local knowledge was established in Tanzania for mainstreaming local knowledge at the national level. Moreover, this trust fund aimed to ensure the sustainability of the

project's efforts in Tanzania on the long term. The trust acted as a platform for advising the government on LinKS issues in the country, to creating a forum for advocating, promoting, protecting and networking LinKS to ensure its continuous use and sustainability for social-economic development. The trust, which is a nongovernmental and nonprofit-making organization, was prompted by the need to make LinKS issues visible in national policies and strategies at different levels. The trustees, from eleven different institutions, gave a multidisciplinary nature to the process and offered a good platform for exchanging experiences, and sharing ideas and information on LinKS management issues (Zangari 2005).

Mozambique and Swaziland, also project countries, expressed interest in a similar process and have established informal networks of different partner institutions that have a specific interest in local knowledge.

3.4 Project challenges

LinKS was a complex project in terms of its thematic focus, the scope of its activities, the number of countries involved (four) and project management. It not only dealt with the three main issues of gender, local knowledge and agrobiodiversity but also with the linkages between these. Inherent to the thematic focus was the emphasis on gender-sensitive participatory approaches, perceived as the best/only way to develop an understanding of local knowledge and gender issues. Further, the project was implemented in a participatory manner, at least as far as FAO administrative regulations would permit. The participatory management style, together with a holistic approach, was a new and innovative approach for FAO in project implementation. This complexity—both conceptually and logistically—posed numerous problems to those involved in the project. The following section highlights the main challenges and the solutions developed to achieve the project's objectives.

Project concepts

Each of the three main LinKS themes was a challenge in itself. Over thirty years of research on gender issues point to the difficulties of addressing the gender approach as methodological analytical tool. There are different interpretations, complex theoretical frameworks and several analytical points of reference. Attempts to address local knowledge and agrobiodiversity are similarly complex. For example, 'agrobiodiversity' was perceived by some partners as a new buzzword without a real understanding of its meaning or how to deal with it. Going beyond these individual challenges, LinKS tried to highlight, from the perspective of sustainable livelihoods, how these three themes are interlinked and how they influence each other. The aim of LinKS was to convince partners that only a holistic approach could provide an in-depth understanding and serve as a tool for strengthening food security and sustainable agrobiodiversity management.

The linkages between gender, local knowledge systems and agrobiodiversity management for food security cover a large research area that involves a wide range of cross-cutting issues. These need to be looked at from a holistic and systemic perspective. Only through an interdisciplinary approach, and by integrating different, complementary, disciplines can a detailed understanding of the complexity be developed. Therefore, research activities needed to be designed in a process-oriented

way to include the active involvement of all disciplines concerned from planning to implementation, to the analysis and interpretation to ensure a critical reflection of the outcomes (FAO 2003). Such a multidisciplinary manner was extremely challenging, as ministries, universities and most NGOs traditionally work with a sectoral approach.

Attempting to strike the right balance between the three themes, the project experienced difficulties with:

- i) project partners having problems in conceptualizing more than one theme simultaneously;
- ii) project partners having difficulties in establishing clear linkages between the themes;
- iii) there was a tendency for 'the concept to fade away' and had to be refreshed from time to time;
- iv) concepts not always understood accurately (i.e., gender/power; participatory methodologies).

As research progressed, it became clear that both national and international partners experienced difficulties in incorporating gender in a comprehensive way while integrating local knowledge and agrobiodiversity. Research reports and seminar papers reflect some of the difficulties faced by partners in trying to grasp the three themes simultaneously. Some placed more emphasis on local knowledge, paying lip service to agrobiodiversity, while others incorporated more of a gender perspective. In terms of 'gender', many reports showed significant oversights because:

- i) Gender was approached in an inconsistent manner, presenting some of the findings disaggregated by sex or analysed along gender lines, or in a gender neutral manner;
- ii) Focus was on local knowledge or agrobiodiversity, with little reference to gender;
- iii) 'Gender' was interpreted as 'women' and 'women's knowledge', with little or no comparative data on men or other socioeconomic aspects.

Even the international research institutions involved in the project to provide technical backstopping to the national research teams were often unable to deal adequately with these complexities.

So, how did the project team deal with this conceptual challenge? First of all, efforts were made to clarify the concepts as much as possible. To ensure common understanding, a clear definition was developed for each conceptual term, and a strategy was drafted for each of the three core activity areas: research, capacity-building, and communication and advocacy. The individual strategies were then compiled into one overall project plan. In addition, research guidelines were developed with the support of Noragric.

These measures, however, did not really help the partner institutions and research teams in carrying out the research. It became obvious in both field work and data analysis that despite intensive training and technical backstopping throughout the

research period, the application of concepts and approaches was not clear. Pre-field training was offered to ensure that researchers were able to document local knowledge in such a way that was also beneficiary to the local communities/the proprietors of knowledge. In addition, during intervals between field work, time and technical support were allocated to data analysis and to a careful and rigorous reflection of the findings.

Initially, training workshops focussed on the application of gender-sensitive participatory tools within the context of gender, local knowledge and agrobiodiversity. It was assumed that this would also bring a sound understanding of the concepts and their linkages. When it became clear that this was not sufficient, a training manual was developed to address the tools and to clarify the concepts and their linkages. Both methodological and the more conceptual training workshops were complementary.

Participation for all?

The original operational document proposed that the LinKS project be developed with stakeholders in a participatory manner to ensure long-term sustainability. All stakeholders, together with the project team, would be involved in developing and shaping the scope and activities of LinKS project in a participatory manner. At a first glance this did not seem to be an impossible task. However, taking FAO's administrative procedures and its perception of participation into consideration, it turned out to be quite a challenge.

After the first phase of the project, it was clear that there was need for a reassessment of how much participation was feasible, given the various factors inherent to FAO (i.e, a top-heavy and procedure-encumbered institution) that hampered the participatory process (e.g., bureaucracy, hierarchical structures, non-participatory 'cultural' values, etc.). Moreover, the project was totally managed from FAO headquarters, which added another dimension to the problems.

The section below shows how the project management tried to respond to these challenges.

Participatory project management

In an attempt to mitigate the participatory 'limitations' posed by the existing institutional framework, LinKS set up a special project structure. National coordination teams with managerial responsibility for project activities were established in each project country, and these were in close contact with the project team at FAO headquarters, who had overall responsibility. As much as possible, this responsibility was delegated to the national teams. For instance, in Tanzania a technical advisory team was created to provide additional technical support to the national team. National team offices were established within the hosting institutions, rather than within the FAO representation. Thus, a much closer collaboration with partner institutions was possible: this was an important element to assure the integration and continuation of LinKS activities in the long term.

These partner institutions formed informal networks. They met regularly to exchange experiences on LinKS issues and searched for ways to disseminate and mainstream

project output and that of their own activities. LinKS staff helped with these participatory networks and strengthened the interface between civil society and government agencies. The development of such a horizontal structure, where all member institutions had the same rights and possibilities to work for the advocacy of local knowledge, was an interesting example of a participatory bottom-up approach. In Tanzania, the network went a step further and created a national trust fund on local knowledge.

Compared to usual FAO projects, the structure of the project and the communication channels were simpler, more flexible and less hierarchical. However, the fact that the project operated in a slightly different way than the conventional FAO project provoked some confusion with FAO colleagues, often hampering project implementation. For example, delays in payments postponed the start of research activities or signing of consultants' contracts. This was a considerable challenge for a participatory project working with farmers who depended on the seasons. A payment late 'only' three or four weeks could easily lead to a half-a-year delay in research activities because certain seasonal activities could not be carried out as planned. In addition, research team members were usually affiliated with different partner institutions, each with their own responsibilities and commitments which needed attention as well. Such recurrent delays meant that the participatory processes were often interrupted and momentum lost both for the research teams and the communities involved.

3.5 Promoting participatory research

The journey had been long between the project's starting point—when the rural community had been 'allowed to participate' in the research study—to the final stage when a research team member pointed out that, 'Farmers are the real specialists! They have their own choices'. In the early stages, the LinKS trainers were often confronted with a 'we know it all' attitude. However, during field work it became evident that most of the workshop participants could never have the opportunity to apply participatory or gender-sensitive tools in a real-life situation. Also, it became clear during the different research studies that the simple application of participatory tools did not go far enough. Anecdotal reports were presented by the research teams, underlining the specific local character of local knowledge and practices. Partner institutions lacked an in-depth understanding of the linkages between local knowledge, gender and agrobiodiversity for food security.

Too often, participatory tools may be considered as 'simple' by formally-trained scientists and researchers. However, the notion of 'simple is easy' is clearly not true for participatory approaches. Experience clearly indicates that internalizing and adopting participatory approaches is a long and iterative process that needs time and commitment from all involved. Over twenty years of global literature on participatory learning approaches highlight the fact that people need intensive guidance and in-depth training both in the uses of participatory tools and in working with communities in ways that do not raise their expectations needlessly. As one team member stated, 'One training session of two weeks does not change people's attitudes that much' nor can it fully provide them with the skills for applying participatory tools and techniques.

A two-week training course cannot fully equip participants to incorporate gender issues and participatory approaches in their work. Iterative approaches to training were much more effective in the long run, allowing researchers and extensionists sufficient time to work with the communities, adapting and revising approaches before trying them again. Experience in LinKS suggests that training prior to a research activity is important but not enough. Over and over, participants indicated the need for post-workshop follow-up monitoring and mentoring to assess the problems faced in attempts to implement what the people had learned at the workshops. LinKS tried to address this through intensive technical support throughout the research process, from research design, data collection and analysis, to interpretation and presentation.

Research reports were shared with the local communities and stakeholders for feedback before being finalized. Such feedback sessions were also important to identify follow-up action with the local communities and stakeholders to ensure that they benefited from the studies. For example, when the seed-system studies in Tanzania identified the need for better access and sharing of local varieties, local seed fairs were organized, giving farmers opportunity to meet, share experiences and exchange their own local variety seeds.

Considering the numerous partners involved in the project, LinKS made a special effort to encompass a wider range of stakeholders in the research with participatory action. After overcoming some initial hesitation, the research teams adapted a simplified version of the PAR (participatory action research) approach. Over time the research teams organized the study in repeated cycles based on methods of reflection-planning-acting-observing. Each time, different stakeholders were involved.

During each round, the research questions and tools were revisited, refined and rendered more focused. Communication became more ‘intimate’ and barriers reduced, once participants were more increasingly involved. In Tanzania, during the first cycle of the study on traditional seed systems, the participants’ overall impression was that a lot of local seed varieties had been lost in the area under study. During the second cycle, however, because of a more focused approach, the research team members identified very knowledgeable farmers and concluded that local seed varieties had not been lost after all. They were still being planted by knowledgeable farmers, but on a very small scale.

3.6 Beneficiaries

Another challenging aspect of the project was to identify the actual beneficiaries and to determine how each could in fact benefit from the project. The original project document outlines the following beneficiaries (Box 2).

The experience from phase one made it clear that, given the timeframe, resources, institutional set-up and scope, it was impossible to reach all the initial beneficiaries. The project did not have the capacity either to work directly with farmers or to focus very much on policymakers. While the project document had anticipated early on quite a few policy and advocacy activities, achieving them was unrealistic. Therefore,

Box 2
Anticipated beneficiaries of the LinkS project

Rural men and women: The project involves rural men and women in participatory research and action-oriented activities that will provide them with opportunities to share information, dialogue among themselves, and share experiences. Moreover, an additional means of benefiting this group is to influence the thinking and the approaches used by researchers, government agencies, NGOs and policymakers so that their interactions with rural people are based on respect for and appreciation of their knowledge, needs and perspectives.

Researchers in research institutions and **faculty** in universities and training colleges. This group benefits from the training activities, which are designed to enhance skills in using gender analysis and participatory research approaches, as well as from other learning opportunities such as workshops, seminars, exchange visits and the dissemination of methods manuals and teaching material. Some researchers will benefit directly from small grants provided by the project to support research activities, and the opportunities associated with this research to gain greater skills in conducting participatory research with rural communities. Universities at large will benefit from the support for curriculum development, opportunities to debate the issues and undertake carry out participatory research.

Mid-level development workers, including staff in NGOs and government agencies or projects that are working with rural communities. This group benefits from the training activities. Some NGOs and government agencies are also directly benefiting from the small grants provided by the project to support their on-going activities.

Policymakers: This includes policymakers in civil society and government, technical units (such as the seed units) of the ministry of agriculture in each country and other key policymakers in the government sector. This group benefits from the opportunities provided by the project to discuss and debate issues and by the information generated or disseminated by the project that can contribute to informed development of national strategies and policies.

during the second phase, LinKS tried to meet the needs of the farmers through intermediaries, i.e., institutions and individuals working with farmers. These mid-level development workers and researchers were considered as an important catalyst for spin-off effects to the academia, government and NGOs. It was believed that the knowledge and experience gained from involvement in the LinKS project would spill over into other areas, such as agricultural extension, natural resources management, and advocacy for local communities, etc. Decisionmakers were targeted mainly through participation in awareness-raising workshops and the provision of various information materials.

4 Summary of main findings

The LinKS project did not emerge in a vacuum. Instead, it continually attempted to build on existing activities and initiatives, trying to reinforce and strengthen partner institutions in issues on gender, sustainable management of agrobiodiversity and local knowledge. Thus LinKS reinforced existing trends and tendencies. An increasing interest, particularly in Tanzania, in the three themes was noted. The project's efforts to strengthen local knowledge were reinforced by the World Bank's indigenous knowledge programme and by several national institutions working together in a complimentary manner. Several countries—for example, Uganda and Kenya—showed interest in local knowledge research.

Capacity-building for participatory approaches, gender analysis and local knowledge was a time-consuming exercise. The LinKS experience clearly indicated that it was not enough to provide people with one or two training workshops and then expect them to apply what they had learned. People needed time and opportunity to apply newly acquired techniques in day-to-day working situations. The big challenge was providing sufficient time and opportunity to make sure that people understand the approaches and tools, to apply them and therefore to change their thinking. This was very time consuming. Furthermore, this amount of time had never been included in any of the work plans or budgets.

Most international organizations claim to work in a participatory way and to apply gender analysis and tools. Is this lip-service? The answer is no. In fact, most of the workshop attendants had already participated in several similar training sessions and felt that they knew it all beforehand. But once in the field, they were unable to use the approaches and tools properly and coherently. A closer look at the issue revealed that little had been achieved by the quick and often limited inputs provided by donor organizations training workshops.

One gap became profoundly evident while working with the teams in the field: many researchers were unable to analyse socioeconomic data and to report research results in a coherent and well explained manner. Also, the combination of qualitative and quantitative data, their analysis and presentation created a challenge. Research reports frequently consisted only of tables or anecdotal stories. Thus, the need for capacity-building and for developing appropriate training material was great.

But some interesting research results were observed in relation to seeds, plant genetic and animal genetic resources. Studies in Swaziland, Mozambique and Tanzania highlighted interesting findings with regard to the link between local knowledge and agrobiodiversity, particularly the effects of HIV/AIDS on seeds management. The relation between the epidemic—affecting primarily women—and the consequent loss of female crop knowledge of seed varieties had previously been unknown. Another interesting point was the extremely limited exchange of information between husband and wife, leading again to a loss of knowledge and of agrobiodiversity. These studies emphasized the importance of underutilized crops—not cash crops that are used for marketing, but food crops for survival.

Food crops were still vital for the rural population. In Tanzania, for example, farmers did not depend on the formal system to any extent. During the first round of research, most of the local diversity in seed variety appeared to have been completely lost. A deeper analysis, however, showed that most were still available but in a very small scale, with only a few knowledgeable farmers. On the other hand, improved varieties, where available, were often not affordable to farmers, as these were sold in very large quantities. Research extension staff's knowledge of local seed varieties was limited and therefore formal and informal seed systems really did work in parallel. There was also a distinction between the crops farmed by women (food crops) and by men (cash crops), but this appeared to be quite flexible and dependent on markets fluctuations.

With regard to animal genetic resources in particular, an ongoing study on livestock in Tanzania looks at the Masaai society to examine local knowledge, and the roles and responsibilities of women in connection with animal genetic resources. According to

preliminary conclusions, the local knowledge of the Maasai of Simanjiro is alive and dynamic, and widespread among all members of the Maasai society. The extent to which local knowledge is maintained and practised differs according to age and gender. Knowledge is passed along vertical lines from older members of the society to the younger groups through instruction and initiation. But information is also exchanged horizontally through interaction with peers, through personally contact, and through contact with the outside world (travel, markets). The research team gained a better understanding of the concept of local knowledge and its relation to project objectives. The link between local knowledge and community preferences, and the criteria for breeding and selection were well documented. The team gained further insight into the approaches and methods of conducting social research, and in understanding that a difference exists between informal and participatory research.

4.1 The way forward

FAO has long recognized the strong linkages between the different knowledge of men and women, their skills and biodiversity so critical to agricultural production and food security, and has supported various initiatives in Asia, Africa, and Latin America. Given FAO's mandate within the UN system for food and agriculture, it has an important role to play also at the level of international policy. Much support was provided through the 1990s to make sure that gender remained on the international agenda, particularly in arenas such as the Commission on Genetic Resources for Food and Agriculture (CGRFA).

Based on FAO's experience with the LinKS project, the following points need further attention.

As mentioned in the introduction, the International Treaty on Plant Genetic Resources for Food and Agriculture is an important step in bringing together governments, farmers and plant breeders as it offers a multilateral framework for accessing genetic resources and sharing benefits. So far, negotiations and discussions have taken place at an international level. However, for treaty implementation, the signatory countries need to develop tools and mechanisms for the national level. Furthermore the treaty does not focus on the gendered nature of local knowledge. Additional action is required to ensure that distinctions are made, where appropriate, between the different knowledge bases and access of resources of women and men.

The trust fund, created in Tanzania and focusing on local knowledge and agrobiodiversity, could function as a national support instrument for the implementation of the Treaty. It could serve as a platform for experiences on local knowledge and agrobiodiversity. Moreover, it could help to clarify the process on issues surrounding farmers' rights, and to define who, in Tanzania, are the 'farmers'. The enormous effort of bringing the Treaty into force and all the mechanisms and instruments that still need to be developed will be successful only if policy institutions recognize that men and women farmers play an important and crucial role in the management and conservation of plant genetic resources. Furthermore, men and women farmers need to participate actively in the decisionmaking processes and make use of their right to share equitably the benefits arising from the utilization of plant genetic resources.

More work is needed to understand the institutions, associated constraints and incentives influencing relevant actors in their use of the LinKS concepts in their daily work. For example, the Plant Breeders Rights Act in Tanzania provides the incentive for breeders and others to develop and release new varieties (a percentage of the royalties from the sale of seed should go to the breeder and organization responsible for release), but there are few incentives for researchers and extension workers to assist men and women farmers to better manage their own seed (which comprises the vast majority of the seed planted in Tanzania).

Increased productivity, economic growth and agricultural productivity are important elements in poverty reduction. The diverse and complex agroecological environment of Sub-Saharan Africa will direct future efforts on more localized solutions, instead of an 'Asian-type green revolution'. This means that future activities will have to build much more on local knowledge and agrobiodiversity with a clear understanding of gender implication.

Annex I: Short overview of the LinkS project Phase I and II (1997-2005)

Project countries

Mozambique, Swaziland, Tanzania and Zimbabwe (until May 2002)

Budget

US\$3,813,953

Development goal

Enhance rural people's food security and promote sustainable management of agrobiodiversity by strengthening the capacity of institutions in the agricultural sector to apply approaches that recognize men and women farmers' knowledge in their programmes and policies.

Immediate objectives

- Enhance the ability of researchers and development workers from key partner organizations to apply an understanding of gender, local knowledge, biodiversity and food security in their work by providing them with diverse learning opportunities as well as skills enhancement in gender-sensitive and participatory approaches.
- Increase the visibility of men and women's knowledge about the use and management of agrobiodiversity among key development workers and decision makers by supporting documentation of good practices, research and communication.
- Enable partner organizations and policymakers to network, develop guidelines and strategies, and take action to promote a greater recognition of rural people's knowledge, needs and perspectives by providing financial and technical support for partner's initiatives at all levels.

Strategy

- Basic strategy of building on and 'adding value' to the ongoing activities of partner organizations.
- Enabling local initiatives for mainstreaming and institutionalization.
- Decentralized decision-making processes.

Beneficiaries

Men and women farmers as custodians of knowledge; development workers, researchers and staff from institutions in the agriculture and environment sectors.

Structure

- National country teams consisting of a national coordinator, a project assistant and a project driver facilitate activities in each country;
- 'Hosting institutions' provide housing and support services;
- The Gender in Development Service at FAO provides overall management and coordination.

Annex II: Acronyms

CBD	Convention on Biological Diversity
CGIAR	Consultative Group on International Agricultural Research
CGRFA	FAO's Commission on Genetic Resources for Food and Agriculture
IPGRI	International Plant Genetic Resources Institute
IPR	intellectual property rights
ITPGR	International Treaty on Plant Genetic Resources
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
LinKS	a regional FAO project on local indigenous knowledge, gender and biodiversity in Mozambique, Swaziland, Zimbabwe and Tanzania
MDGs	Millennium Development Goals
NGOs	nongovernment organizations
Noragric	The Department of International and Development Studies at the Norwegian University of Life Sciences
PAR	participatory action research
PGRFA	Multilateral System of the International Treaty on Plant Genetic Resources for Food and Agriculture
PVP	plant variety protection
SOFI	FAO's annual report, <i>The State of Food Insecurity in the World</i>
TPGR	Treaty on Plant Genetic Resources
WFS	World Food Summit
WSSD	World Summit on Sustainable Development

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