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The end of Canberra-based *PLEC News and Views*

The electronic version of *PLEC News and Views* began in March 2003 and we regret to announce that this eighth issue is the last. Lack of finance, despite efforts to secure funds, is of course one reason, but there are also other good reasons why this Canberra-based periodical should now come to an end.

Over the last three years, we have been able to report on continuing activities among the farmer associations, and also to publish papers telling us what participants in the old project are now doing. But with the publication of the East and West African books, the formal publication programme of PLEC 1993-2002 is at an end. PLEC is no longer managed from Canberra, and though what Miguel Pinedo-Vasquez, the Scientific Coordinator, describes in his article below as 'PLEC Central' remains without specific funding, its location is now in New York and, to some degree, Amazonia.

Information does not reach us in the way it used to do and, increasingly, nor do offers of papers from the membership. Other than the overview by Miguel Pinedo-Vasquez, the present issue contains only one contributed paper from a PLEC member, our stalwart from long ago, Fidelis Kaihura. While there may be other papers in preparation, they are probably papers that would better be published elsewhere. Moreover, most of our time is now taken up with the twice-monthly PLECserv, which may have a continuing life perhaps in a slightly variant form.

We have enjoyed producing e-PN&V, and like Miguel, we hope it will have a third incarnation once the diverse successor to old PLEC is more firmly established. But the third incarnation should breathe its life closer to where the project is now coordinated. So we are signing off. Good fortune to all our many friends.

Harold Brookfield and Helen Parsons



PLEC: Continuing to diversify

Miguel Pinedo-Vasquez

PLEC is not history: it lives on in a number of ways

In the *PLEC News and Views* published in November 1998, we wrote: 'PLEC is not just a project about diversity; it is a project that thrives on the diversity of its participants and its constituent Clusters.' At that time we noted that each Cluster had a unique composition of researchers: botanists, geographers, soil scientists, agronomists, and other specialists in various combinations. Each group also had a unique history of approach and experience; many participants were academic researchers and teachers, some worked for government research and experiment institutions, others worked in demonstration, extension, outreach. We considered that diversity a source of the strength of PLEC.

That richness of training, experience, and approach, continues to characterize PLEC as it is now configured, even more than it did seven years ago when we wrote about our dissimilarities. Present-day post-GEF PLEC groups and scientists share a good deal of training, experience and outlook, but we also continue to differ in a host of areas and domains. In this brief paper I will try to outline where PLEC as a whole may be going in the near future, by describing a few of the directions that particular groups are taking their work. What they are doing follows on from discussions in 2000-02, as set out in the final report. The vision was summarized by Pinedo-Vasquez (2003).

Mainstreaming demonstration into local curricula and beyond

PLEC groups in the Amazon, particularly in Brazil, continue to carry out a variety of research activities with funding from several sources, including funds from governments and private foundations. Some of PLEC-Amazonia's most important work, however, continues to be in demonstrating successful and biodiversity-enhancing production technologies. Over the last few years PLEC members in Brazil have actively participated in the development of a two-year training program for rural extension agents in the Brazilian state of Amapá. This innovative program integrates demonstration activities, visits to demonstration sites, and three months of field training by expert farmers. Since it was implemented in 2002 the program has successfully trained more than 200 extension agents, the majority of whom are working in rural areas of Amapá. While the training program includes traditional training courses in the classroom and experimental station, students are required to spend most of their second year training in the field interacting

with expert farmers, visiting demonstration sites, and participating in demonstration activities. When students visit demonstration sites they record and document technologies, knowledge and strategies used by farmers to solve specific problems. Perhaps one of the most important results of spending time with expert farmers is that it has exposed young students very effectively to the realities of the lives of local poor farmers. Based on the Amapá experience, similar programs are currently under development in the Amazonian states of Amazonas, Acre and Pará.

Mainstreaming has reached beyond the training schools as well, with researchers and academics increasingly using the concepts of agrobiodiversity in their analysis of smallholder land uses, particularly in marginal regions where farmers and their livelihoods are vulnerable. In Amazonia, PLEC's suggestion of the importance of livelihood diversification and of maintaining agrobiodiversity, are continually mentioned in regional discussions of how to reduce poverty and increase rural food security in Amazonia and other developing countries.

Capacity building aimed at various groups and employing a diversity of modalities is also being done by the highly successful Ghana Cluster through its new SlaM project, as well as by Clusters in Jamaica and Thailand. Each of these efforts features a distinct combination of training at various levels and temporal scales. For instance, in Jamaica the PLEC team is focusing on university-level training, while in Thailand, our colleagues are involved in a variety of farmer training courses. The Ghana team is including training sessions for policy makers and journalists. In its new proposal the Tanzania team plans to offer demonstration activities to technicians and researchers working in government development agencies.

The diversity of groups that are being trained by PLEC participants is having direct results in local and national development and conservation programmes. In the Brazilian Amazon, for instance, rural extension agents are now being called 'Agents of Rural Monitoring' and they are charged with recording local technological and organizational diversity, in addition to their traditional role of promoting approved crop and production systems, which they now do with local 'expert farmers'. The influence of PLEC is being felt widely.

Redirecting research

While some PLEC clusters have redirected their capacity-building activities toward a variety of specific target groups, PLEC Clusters have also diversified and extended their research activities. Among those that have been very active in research is the Thailand Cluster that has been working for the last four years on the diversity of rice crop germplasm. Combining genetics, ecological and social research, the Thailand group has looked at some of the organizational and social mechanisms through which rice diversity is preserved, transformed, and created. Focusing on a topic that previous PLEC evaluations had suggested as potentially important and yet understudied by PLEC, the group's focus on intraspecific diversity in rice is situated within broader studies of diversity and change in local rice farming landscapes. The Thailand group has recently received new funds that will allow them to extend their rice-focused studies to the neighboring countries of Cambodia and Laos.

A greater emphasis of research on smallholder forestry and agroforestry systems continues to characterize the recent work of many groups, most prominently the Clusters in Peru and in China's Yunnan province. The Peru group is conducting in-depth studies of fast-growing timbers as income generators for farmers who are losing their markets for agricultural crops to agribusiness. The PLEC researchers in the Peruvian Amazon are looking beyond the rural locations and populations with whom they have long worked, and are tracing rural-urban linkages that are increasingly crucial to understanding how the timber produced in highly diverse systems actually enters a variety of markets. While local and regional markets are the focus of the Peru group, national and even international markets are central to some of the agroforestry research in China. A number of our PLEC colleagues working in the southern areas of Yunnan province have been carrying out multi-faceted, long-term research on the region's highly diverse and centuries-old tea gardens, whose products are now highly appreciated in a booming world-wide market. Both of these Clusters are tracing and analyzing not only the economic benefits generated by the obvious crops and products of these systems; they are also monitoring a variety of other ecosystem services that the systems maintain, including the conservation of biodiversity.

Yet other research foci among PLEC Clusters include topics as different as methods of 'water harvesting' in the drylands of Tanzania, and the resilience of local production technologies and farming communities to extreme rainfall events associated with hurricanes in Jamaica. With alarm growing this year about the number and severity of typhoons and hurricanes in many parts of the world, this focus on responses to catastrophic events may be of growing importance. In the case of Jamaica for instance, local government officials are already using field research information produced by PLEC members, including data on agroforestry systems developed by farmers to control

the landslides that occur with hurricanes. A focus on management of 'land degradation' continues to be central to the activities of many PLEC Clusters.

New partners and new networks

The diversification of PLEC topics and approaches by Clusters is mirrored by their participation in new partnerships and networks that serve to both access and disseminate information broadly and to multiply the impact of their work. The Brazil Cluster, for instance, has begun working with the Amazon Cooperation Treaty Organization (ACTO), which brings together eight countries that include areas of Amazonia within their borders. Amazonia-PLEC is helping the regional organization place biodiversity, and specifically agrobiodiversity, concerns into its development cooperation agenda. PLEC members in Brazil are promoting a strategy that will bring in local governments as well as farmers into the ACTO discussions on how to best preserve regional biodiversity for the benefit of all.

Some PLEC Clusters, the Guinea Cluster in particular, are exploring participation in the GIAHS project, an initiative with the FAO and UNESCO in leading positions. The project aims to conserve a number of what have been called Globally Important Ingenious Agricultural Heritage Systems (GIAHS) throughout the world. The tapades systems in the Fouta Djallon region of Guinea, a system that PLEC participants have worked on for years, is being considered as a candidate for the project. We have already mentioned other broader outreach initiatives through the formation of new projects and alliances, including the new rice research projects that members of the PLEC group in Thailand have developed. There are many more such initiatives, large and small, among our Clusters and participants.

The global reach: a future for "PLEC Central"

Reaching out to other networks and partners is not only being done on the Cluster or national level in PLEC, but also on the global scale. We are members of several networks. Among these are Ecoagriculture Partners, which helps in particular to disseminate our listserv publications. PLEC is also participating in a new unit proposed by IPGRI that is being set up to ensure that agricultural biodiversity receives the emphasis it deserves in future research. This is being established by the System-wide Genetic Resources Programme (SGRP) of the Consultative Group on International Agricultural Research (CGIAR).

Much of this new work that is being done by PLEC participants reflects a new diversity of funding sources that are being tapped by Clusters and individuals. The Ghana Cluster has been most successful to date among all the groups in securing new funds from the GEF, historically our largest source. Other groups including those in Thailand and Papua New Guinea have also secured some smaller

funds from various programs of the GEF. A number of Clusters and PLEC on a global level have proposals at various stages within the GEF system.

Many more Clusters have been successful in their search for funds from non-GEF sources, including national, bilateral, and international organization sources. Several groups have also had considerable success in accessing funds from private foundations large and small. The support of various universities and research institutes has also kept PLEC research and demonstration activities going throughout the world. The Australian National University has continued to support PLECs. The success of PLEC clusters in securing funds from several sources for the continuation of PLEC activities is a guarantee for producing new and innovative ideas that reflects the continue changes of land and resource use and its impact on the livelihood of smallholders.

In summary, PLEC continues to thrive on diversity at national and regional levels. We have always prided ourselves on our diversity and we continue to find strength in our common purpose and approaches as well in each of us following some divergent paths. We do now find a challenge in keeping our extremely important centre and its communications functions funded and operating, but we hope that this hiatus in a highly visible 'PLEC Central' will be only temporary. The important achievements of PLEC won't be lost when *ePLEC News and Views* ends its regular circulation. To the contrary the many new and challenging visions of PLEC will continue to evolve and influence policy and opinion-makers on the global, regional and national levels.

Finally, we hope that this last issue of our electronic newsletter won't be the end of the newsletter but rather a break before starting a renewed newsletter rich in information from the field for all PLEC members, friends and other readers.

References

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Pinedo-Vasquez, M. 2003. Forward: mainstreaming PLEC's vision and upscaling PLEC's goals. In H. Brookfield, H. Parsons and M. Brookfield, eds, *Agrodiversity: learning from farmers across the world*, pp xx-xxiii. Tokyo: United Nations University Press.

New Book : Sweet Potato in Oceania

The Sweet Potato in Oceania: a reappraisal edited by Chris Ballard, Paula Brown, R. Michael Bourke and Tracy Harwood. *Ethnology Monographs* 19 / *Oceania Monograph* 56

Sweet potato occupies a central role in the cultures and subsistence systems of many indigenous societies in Oceania, especially in those of Aotearoa/ New Zealand, Hawaii, the Solomon Islands and New Guinea. Life in many of these communities is now unimaginable without it as a staple, but this has not always been true. It seems certain that the sweet potato was introduced to Oceania from Central or South America—but when, how and by whom? By what processes did sweet potato come to dominate the agricultural systems of so many Pacific communities?

The eighteen chapters in this volume represent the cutting edge of current cross-disciplinary thought on these questions, which are tackled here by archaeologists, historians, anthropologists, palynologists and agricultural scientists. Doug Yen's 1974 volume, *The Sweet Potato and Oceania*, defined the terms for this debate, and many of the papers in this collection address and seek to refine his original findings. Yen himself offers a final reflection on progress since his definitive statement.

The other contributors to the volume are Chris Ballard, Michael Bourke, Simon Haberle, Gill Atkin, Richard Scaglione, R. C. Green, Helen Leach, James Coil, Patrick Kirch, Paul Wallin, Christopher Stevenson, Thegn Ladefoged, Serge Dunis, Matthew G. Allen, Tim Bayliss-Smith, Jack Golson, Philip Hughes, Russell Blong, Wal Ambrose, Polly Wiessner, Paula Brown, Harold Brookfield, David Boyd and Anton Ploeg.

The book may be obtained from either Australia or the USA.

From Australia:

Oceania, University of Sydney, 116 Darlington Road NSW 2006 Australia

Tel: 61-2-9351-2666 Fax: 61-2-9351-7488

email: oceania@arts.usyd.edu.au

Within Australia: A\$62.70 (including GST and postage), or US\$56.00 to other destinations (including postage by economy air).

From the United States:

Ethnology, Department of Anthropology

University of Pittsburgh

Pittsburgh PA 15260 USA

Tel: 412-648-7503 Fax: 412-648-7535

email: ethnolog@pitt.edu

US\$43.65, plus postage.

Papers

Viewing the Millennium Development Goals from the lake zone of northern Tanzania

Fidelis B.S. Kaihura¹

The challenge for all developing countries is to reduce poverty, become food sufficient and sustainably manage the environment. This is reflected in most national policy documents. In Tanzania for example, the Tanzania Development Vision 2025 (TDV 2025) is a national development blueprint. Within the TDV 2025, the 2001 Agricultural Sector Development Strategy (ASDS) has a primary objective of creating an enabling and conducive environment for improving the productivity and the profitability of the sector. This will serve as the basis for improved farm incomes and rural poverty reduction. The ASDS is operational through the Agricultural Sector Development Programme (ASDP), whose primary objective is to create an enabling environment for improving agricultural productivity and profitability, improving farm incomes, reducing rural poverty and ensuring household food security. A number of specific instruments are designed to implement the programme, with sub-programmes and components aimed at supporting the agricultural sector at community, district and national levels as well as maintaining links with other sectors.

The national objectives and implementation strategy are in line with the millennium development goals (www.un.org/millenniumgoals). Among these goals are eradication of extreme poverty and hunger (goal no. 1) and ensuring environmental sustainability (goal no. 7). The seventh goal further emphasizes that policy makers must focus on the poor in rural areas and urban slums. It also cautions that city dwellers are about to outnumber rural populations in the developing world. Tanzania is experiencing similar trends.

In early and mid 2005, we conducted Participatory Rural Appraisal (PRA) in the Lake zone of northern Tanzania to evaluate the integrity of the agro-ecosystems and identify opportunities and constraints of meeting smallholder food and income security while sustaining environmental quality. This paper highlights the findings which focus on some of the limitations to meeting desired sector objectives. It then outlines some of the strategies carried out by different stakeholders in the agricultural sector to achieve the objectives. While much of what is written reflects views expressed by farmers, the paper also reflects some of the frustrations of the author, through his experience

as the head of a resources management programme at the Ukuruiguru Agricultural Research and Training Institute in the Lake Zone, and for some years also as leader of PLEC work in Tanzania.²

The downside: limitations to meeting smallholder food security

Land tenure and land-use planning

The survey in Kagera on Agro-ecosystems management showed that land tenure is a major limitation contributing to food insecurity through non-conservation agriculture. With increased population pressure and the privatization of the economy many people are becoming landless and have either to sell labour or rent land in order to survive. Production on rented plots can lead to fast degradation of the soil and nutrient transfer when farmers transport both grain and stover to their homesteads for food, livestock feed and fertility improvement of owned plots. Most public lands are used for burnt brick making, cutting grass for mulching and annual fire with the purpose of breaking the tick cycle and regenerating grazing pastures. Dependence of intensive agriculture on the import of biomass from public fields in land-scarce areas is weakened by continued degradation of support fields that are managed unsustainably. Wage-paid work is often carried out in a rush exposing poorly cultivated land to degradation.

The survey also revealed that there were hardly any district land-use plans so that farmers were free to identify and use areas for agriculture or livestock on their own. Lack of land-use plans results in misuse of the land resources and application of inappropriate land uses. Food insecurity is exacerbated by subjecting land to improper use and reduces its current and future production potential. There are hardly any districts in the Lake Zone of northwestern Tanzania where the district has formally demarcated village land into different land use practices. In cases where livestock keeping dominates, grazing and cropping land is demarcated by the village governments. Otherwise farmers move into new areas, after their farms decline in fertility and production, without any prior settlement arrangements, sometimes onto marginal land, like the degraded rweya soils in Bukoba district.

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² All views expressed are, however, the author's own and do not necessarily reflect the opinions of the Institute or of the Government of Tanzania

Availability and capability of extension staff

The number of staff under extension services is not adequate. Extensionists are allocated to work with 350 to 400 households or more. Due to logistical problems extensionists may fail to reach even 50% of the farmers. Farmers continue to work on their own and productivity continues to decline.

The majority of extension staff do not get refresher courses to update their knowledge and gain information on new developments. Several have been in the field for more than fifteen years without training on current developments in agriculture. Such workers fail to comprehend some of the information or technologies developed by research or by farmers themselves. They lag behind technologies and knowledge and in many cases are unable to respond to challenges by progressive farmers.

For some years the number of graduate extension staff has decreased despite their already inadequate number. Students are now expected to sponsor themselves to become professionals in agriculture. Few are able to do so and relatively few graduate. Even the few who graduate may not get employment. They end up establishing petty businesses outside the agricultural industry. They are a wasted resource for facilitating sustainable agricultural production. Many Lake Zone farmers would say the same as the central Tanzanian farmers interviewed by Ellis and Mdoe (2003), that they have not seen an extension officer in more than two years.

Labour availability and employment for the youth

The banana/coffee farming system in Bukoba, northern Tanzania flourished before the 1960s for two main reasons. First was the presence of cattle as source of manure to fertilize the soils, and second the availability of immigrant labour from neighboring countries because of political unrest. The area was also not overpopulated and soil productivity was good. The cattle were wiped out by the foot and mouth disease and today efforts to return cattle into the system are frustrated by the lack of labour either to cut and carry grass for stall feeding or to herd cattle for free grazing. In the past grazing was managed by youths, but currently they can hardly be found in the villages and those living there are not interested in those kinds of jobs. Farmers say that the youths are interested only in jobs which make quick returns. Today's villages are dominated by the elderly who cannot even maintain the size of the farms they previously managed and cannot afford the hard labour of keeping the banana plantations clean e.g. by cutting and mulching with grass and deep digging to uproot couch grass which is a typical notorious weed in Kagera.

Women and development

In every single activity that involves the community, be it for entertainment, grief, family affairs, church ceremonies, whatever, women's involvement is greater than that of men. Look at various church choirs and determine the number of women, visit the hospital and determine the number of female care takers of the sick in relation to men,

go to any funeral and monitor the involvement of women, take stock of the audience at a political campaign and count women, visit farming families at work and count the number of active women in the field. In all cases women are the majority. They are the architects of crop diversity in household farms and silent modulators of anomalies and conflicts of different circumstances in society and households.

Yet the same society does not involve women in issues like deciding what crops to grow on the farm, how to spend the earnings from sales of crops and how to plan and implement village development programmes. Village meetings involving introduction of rural development projects are attended by few women who rarely air their views. Leadership for almost every development activity is by men. Unfortunately, some women still do not trust themselves and hesitate to vote fellow women to office with a myth that women are not as capable as men in managing or decision making and the like. Women cannot traditionally inherit land, cannot own cattle, cannot become group leaders, nor influence change in society although they are the corner stones of household food and income security. The situation is still the same for most rural farming communities. Despite efforts by different NGOs and the government to promote women's involvement in development, little has been achieved at the grassroots level in terms of empowering women.

Information transfer

The flow of information from sources of technology to the end users is very slow and there are many distortions in the process of transfer. At district level, annual agricultural planning and budgeting is done in consultation with village extension staff who are supposed to report farmers' priority activities for that year. Because of poor access, they either get the information late or never. Information does not get to where extensionists do not exist or visit. Even those who get the requests in time often do not consult farmers. They propose what they consider important on behalf of farmers. As a result, many villages miss district support in terms of priority agricultural development issues and get what is not relevant to them.

New varieties, pesticides/insecticides etc, are developed by research. However, experience shows that information on release of new varieties does not trickle down to end users. We often see farmers living close to research and training institutions where technologies are developed and tested, yet who still maintain using old technologies either because information on new technologies has not reached them or the technology is not appropriate. In Arusha District in the 1990s, PLEC observed farmers undertaking their own experiments because they did not know of any scientific research that was carried out to address their problems or did not know where to go to seek information regarding current production problems in their areas. Very few farmers in villages access television news or read newspapers. If they do so they mainly concentrate on sports and comedies. Those with radios mostly listen

to music programmes. Information on availability of new inputs like improved varieties or pesticides does not reach end users in time. Farmers far from village centres and those who do not know how to read fail to use agricultural inputs even if they were able to purchase them.

Some farmers have obtained new varieties from other sources including research stations, but they lack knowledge of the qualities of these varieties. They mix improved and local varieties together in the fields and stores and new varieties get contaminated very fast. Farmers may not know where to get good seed every season and keep their own seed which may be completely different in qualities from ones released a year or two ago. They usually do not have money to buy new seed but continue with that of last season even if it may not be their preference. Food security continues to decline.

Fertilizer subsidies policy

In the past there was a large element of subsidy in Tanzania, both explicit and implicit, in the input prices paid by farmers. Such a policy aimed at encouraging farmers to use inputs such as fertilizer and improved seed to increase agricultural production. Over the years, however, the policy was said to lead to inefficient use of subsidized inputs and to benefit only richer and influential farmers. Removal of fertilizer subsidies constituted one of the major policy changes in Tanzania's structural adjustment programmes. Reduction of fertilizer subsidy was at first gradual. During the 1970s and early 1980s subsidies comprised 4.3 and 2.9 per cent of the agricultural and total national budget respectively. The explicit subsidies amounted to about 50 per cent or more of the procurement costs up to the year 1991. It was then gradually phased out to 40 and 25 per cent in 1992 and 1993. Finally the fertilizer subsidy was fully withdrawn in 1994. Since then fertilizer prices were determined by market forces.

Withdrawal of fertilizer subsidy in Tanzania generated considerable concern. It was feared that the diminished fertilizer use would reduce crop production, particularly of maize, leading to higher prices for urban consumers. It was also feared that national food security would be severely affected if maize production became unprofitable even in the major maize growing areas in the southern highlands of Tanzania upon which the country depends for feeding the nation. The country would then need to spend more foreign exchange on food imports. Recently, the government has decided to reintroduce subsidy on fertilizers, but the maize granary regions in the southern highlands of the country, with high rainfall, are the only regions to benefit. Two thirds of Tanzania (including most of the Lake Zone) is semi-arid and may not receive subsidy if the current policy is maintained. Moreover, the assumption that the southern highlands can feed the rest of the country is flawed. Poor transport systems mean that grain from the south does not reach the semi-arid north and food insecurity persists.

'Improved' varieties

Efforts have been made to improve plant productivity by imparting desirable traits through breeding. Improved varieties have been shown to be high yielding and may tolerate drought. A high yielding variety of coffee was introduced in the lake zone of Tanzania to replace the traditional Robusta varieties in the area. The beans are big and production per stand is very high. In its second year of cultivation in Bukoba, which was a dry year, the crop succumbed to moisture stress and could not meet the observed yields of the previous season. Farmers started wondering about the reliability of the new variety; the traditional varieties yield less but harvesting is assured in good and bad years. Discussions during the Soil Productivity Improvement Farmer Field Schools at Igurugati, Bukoba rural, indicated that the new coffee was shallow rooted without a tap root. Most of its roots spread horizontally to the soil surface unlike the traditional coffee varieties with a deep tap root that draws nutrients and water from the deep horizons of the soil and provides tolerance to drought and infertility. The farmers also roast and grind green coffee beans of Robusta coffee to make high quality coffee consumed locally. The breeding efforts overlooked the many utilities smallholder farmers obtain from their coffee. The scientific efforts to improve farmers' income through higher yielding coffee at higher prices are failing to meet farmer expectations. Unexpectedly this reduces both income and food security at household level.

In a participatory rural appraisal exercise in three districts of Kagera region namely Karagwe, Bukoba and Ngara, similar disappointments were found with introduced banana varieties. Following the decline in soil fertility in the area and weevil and nematode infestation of the local banana varieties, high yielding varieties tolerant of low soil fertility were introduced. Farmers are really disappointed with the low tolerance of some beer varieties to Panama disease and nematode infestation. For those who replaced most of the local varieties in adopting the new ones now have most of their farms infested and are blaming the experts who introduced the less tolerant so-called improved varieties.

While looking into different uses of bananas in the banana based farming systems in Bukoba farmers indicated that the introduced varieties were also less appropriate to local applications in many ways. The pseudostem, leaf sheath and leaves of traditional varieties have a range of uses, but the introduced banana varieties provide many fewer of these ancillary services.

Farmers are forced to spend the little they have in their pockets to buy services they could otherwise enjoy from growing local banana varieties. Furthermore, some of the new varieties produce numerous suckers in very short periods and make a banana farm a forest instead of a farm. A lot of labour is needed to uproot the suckers, and where de-suckering fails due to labour shortage, many very small bunches of bananas are produced which are also very hard to eat after cooking. The new technology is therefore

creating more problems than improvements. In terms of production, the inappropriateness of introduced banana varieties was reported by Acland as early as 1971. He said 'The East African varieties whose names are too numerous to catalogue in the book, have evolved to suit the local environment. In general, introduced varieties from hotter, wetter and more humid parts of the world have given disappointing results'. The uses of the banana plant parts are known to very few of the youths and young adults. While expanding knowledge on the uses of banana plant parts could be the basis for developing improved tools and varieties, the knowledge is gradually eroding. This is an area where indigenous knowledge is not developed to improve livelihoods, but instead is replaced by cheap but less satisfactory technologies from outside.

The Upside: Stakeholder strategies

Participatory Land Use Planning

The current strategy by the government is to conduct participatory land use planning workshops for farmers and farmer facilitators or extension staff. The purpose is to help farmers develop their workplan and to implement activities proposed to be carried out for each established land use (Ministry of Agriculture 2005). Farmers in several districts are now involved in participatory land use planning, identification of activities to be carried out for each land use type and their implementation. Reports indicate that production of crops and keeping livestock in areas demarcated for such uses based on their potential is rewarding including increased crop yields (Kaboni and Munisi 2005).

Capacity building of smallholder farmers

While development of appropriate technologies and their dissemination is one strategy, improving land user and farmer facilitator (extension staff) understanding of the causes and processes of resource degradation is another approach. Where induced degradation takes place, e.g. through soil mining and non-conservation agriculture, farmers rarely associate it with their management practices and often have only limited rational options to mitigate the problem. For three years now the district offices in the Lake Zone have been carrying out training activities in Soil Productivity Improvement in collaboration with FAO. These 'farmer field schools' involve training of trainers, season-long demonstrations, on-site discussions and exchange visits to learn from demonstrations of good soil management practices and farmers' experiences. Because most farmers are resource poor, Integrated Soil Fertility Management approaches, for example using locally available mostly organic inputs, plus modest amounts of chemical fertilizers, and optimizing the effects of nitrogen fixation and nitrogen flush, are the most popular technologies with farmers. Other tested options are those which optimize soil moisture conservation through mulching and green manure, wide spacing especially in dry areas, training farmers in best management and application practices of farmyard manure to ensure minimum nutrient losses,

promoting intercropping and rotation, and optimizing crop livestock integration for soil productivity, and crop yield improvement (Kaihura et al. 2003).

Overall, the exercise intends to strengthen and equip rainfed farming communities and service providers with better management skills and decision making capacity to overcome soil productivity limitations, and to enhance sustainable and economically viable land management practices. Specifically the Farmer Field Schools programme intends to:

- Improve capacity of farmers' and facilitators' understanding of factors and processes contributing to poor and declining soil productivity and associated management implications;
- Develop and strengthen farmers' and facilitators' capacity in decision making for soil productivity improvement using appropriate tools; Improve farmer soil and crop productivity management technologies specific to ecological zones, land use types and farmer categories;
- Strengthen Soil Productivity Improvement participatory approaches for rapid adoption and dissemination of developed technologies.

All this is being done through participatory learning, practice and observations on-farm

Involving schools

Noting that youths have lost interest in agriculture and that they are still unemployed after they reach towns, two approaches have been launched by different projects. One is to work with primary schools and develop childrens' interest in investing in agriculture through small projects such as production of horticultural crops which have a ready market at encouraging prices. This shows that agriculture pays with improved soil management and proper selection of crops and correct timing. The second approach is to convince the decision makers to put more emphasis and time in training in agriculture by revising the syllabus. The process is intended to create an atmosphere of self employment of secondary school graduates into agriculture while employment opportunities are limited in government or private sector.

Enforcing and re-enforcing good by-laws

Since the Villagization period in the 1970s, local governments in Tanzania have been encouraged to enact by-laws to improve social and economic management. The PRA findings in the regions of Mwanza, Mara and Shinyanga and for TAMP project in Kagera (Valentine 2005) indicated that while there are good laws in agricultural production and environmental conservation, they are not enforced. For example, by-laws prohibit cultivation along river banks and on hilltops and steep slopes. Post harvest grazing especially in conserved farms is prohibited as it would destroy established conservation structures and re-start erosion that had been previously controlled. However due to population pressure farmers cultivate all pieces of land available for them irrespective of by-laws. Respecting existing by-laws would reduce conflicts between crop growers and livestock keepers, and reduce costs for

reconstruction of established conservation structures and rehabilitation after other land mismanagement practices. Through working with farmer groups, old by-laws are enforced and new ones formulated for conservation of the land and other resources. PLEC experience in Arusha district between 1996 and 2002 shows that much can be achieved through community decision supported by legal enforcement.

Improved seeds and other agricultural inputs

Local crop varieties have indisputable value to farmers to feed families and sell. The efforts spent by research to breed for high yielding, drought, pest and disease tolerant varieties which are then not quickly adopted by farmers has been discussed above. But there are changes. Researchers are now collecting germplasm of seeds with farmer-desirable traits e.g. fast cooking, good flavour, long shelf life without pest and disease attack. Farmers' preferred traits are taken into account in addition to the traditional research priorities of high yield and drought tolerance. Research policy is also proposing to limit import of the so called improved varieties from outside for improvement of local germplasm, and instead is concentrating on improving existing locally preferred varieties, which in any case dominate in farmers' fields. The national seed certification agency has also realized the long process involved in producing certified seed and the complications of seed multiplication, leading to the situation where there is never enough to distribute to farmers so that dependence on farmers own seed prevails. Even if there were enough seed does not reach the farmers in time and the majority of them have no money to buy it. The agency now recognizes farmers own initiatives and supports farmer produced 'quality declared seeds' as a way of hastening the process of improving seed quality for increased production and yield. Between farmers it is possible to exchange or sell quality declared seed.

The inability of farmers to buy and apply chemical fertilizers is addressed through demonstrations on the use of a combination of organic fertilizers like compost, farmyard manure with modest amounts of chemical fertilizers. The results of 2002/03 and 2003/04 demonstrations in 20 farmer field schools in Bukoba convinced many FFS participants of the value of combining organic and inorganic inputs for fertility improvement and crop yield. A majority of FFS farmers and observing farmers who monitored crop performance of maize to which organic and inorganic fertilizers were applied, is now requesting chemical fertilizers for soil productivity improvement. The problem is to achieve timely availability of the chemical fertilizers of the types appropriate for given soil types. This is partly because input suppliers were not stocking enough of chemical fertilizers, and for those who did so they kept one or two types of fertilizers which may not be appropriate for the farms in the local region. Farmer reluctance to apply chemical fertilizers because they believe that it spoils the soil is now declining and that is a crucial turning point towards sustainable production.

To help farmers use chemical fertilizers and pesticides, the packing is now done in smaller units. Instead of the traditional 50kg fertilizer bags, bagging is now into 5 to 10 kg. bags. Seed is packed into packets of 1 to 10 kg in the case of maize to enable interested farmers to buy what they can afford. The identification of the contents and application rates and procedures on the bags is also written in Kiswahili. Training is also conducted for extension staff for identification and handling of inputs so that they are well equipped to help farmers use the inputs – if, that is, they can reach the farmers. In high agricultural potential areas like Arusha and Moshi where small unit packing has been in place for a longer period, farmers appreciate the bagging, labeling and pricing even though the prices might be higher per unit.

Income generation

There is no shortage of good ideas about what to do. Farmers and particularly youths can be trained in investing in agricultural activities which have the potential to earn them income to meet their livelihood requirements and to reinvest in agriculture. In a small way, income generating activities are initiated as revolving loans to individuals starting with about 50% of a target farmer groups such that the same money when refunded by the first group another group takes the loan. Small activities under this strategy include production of fast moving horticultural crops and keeping layer or broiler chickens. Broilers are usually disposed at six to eight weeks, while layers start laying eggs at 5 to 6 months for a period of 12 months.

Through keeping chicken, one can sell eggs or broilers in a short time. Manure is also obtained for application in the farms or selling where excess is produced. The nutrition at household level improves as the family can use some of the chicken at home. Income generating agricultural production has a great potential for retaining youths in the villages as long as they earn a living. PLEC project had some success in reducing the number of youths rushing into towns in Tanzania and Ghana as a result of involving them in productive agriculture (Kaihura and Stocking 2003; Gyasi, et al., 2004). Through retaining a good proportion of youths in the villages, labour for other farm activities like timely weeding, mulching and transport of inputs like manure from the kraal to the farm could be improved.

Gender sensitivity

Recognition of women's contribution in society and their role as a lubricating machinery in community obligations and issues is currently being promoted by the government and different stakeholders. In most farmer groups and FFS for example, those headed by women are outperforming those by men. It is also encouraging to note that men are equally appreciating the leadership of the women. There are also many women still shy of taking responsibility in the presence of men. The process of change will take long as the strategies to involve a majority of women are not yet in place.

Establishment of the consortium on improved land management

Recognizing that agricultural production is declining in the Lake Victoria Basin and environmental quality deteriorating, collaborative efforts are being taken up by the Lake Victoria Basin regions in northern Tanzania to address technology development and dissemination strategies towards achieving food security, improved livelihoods and environmental conservation. This is an internal strategy seeking to mobilize resources to address pertinent issues affecting smallholder communities and to avoid replication of efforts and waste of resources as much as possible. The consortium will compile a record of existing stakeholders and the technologies developed by each of those, will identify learning sites to demonstrate the technologies, develop a management and a financing system to maintain the learning sites, and evolve a mechanism of farmer training and exchange visits to these demonstration sites. In such a way, promoting networking and fastening on the government intention of promoting rural livelihoods and conserving the environment, the consortium will contribute to achievement of Vision 2025. The consortium is still in the formation stage and ideas from outside and any form of support are welcome. (Kaihura 2005).

Conclusion

Tanzania is a large and varied country, and while much of it is poor farming land there are areas of much higher quality. Mainly in some of these latter areas, the ancestors of modern Tanzanian farmers developed good farming technologies more than a century ago. Some of them are recorded, with admiration, in the classic compilation on African farming systems by Allan (1965). The skills remain and have been needed for adaptation during the colonial period with its pressures to produce cash crops for export, during the radical changes in settlement pattern and local organization under socialism in the villagization drive of the 1970s, and again after the shocks from structural adjustment in the 1980s and 1990s. While all land in Tanzania still notionally belongs to the state in trust for the people, an effective system of land sale and rental has now arisen in most parts of the country and this is the context within which progress toward Vision 2025 must be made. Other changes are more disturbing, and one of them is the failure of a major public good, the extension system. The recently-established Consortium on Improved Land Management is one stakeholders' response to this situation.

While food security, poverty reduction and environmental conservation are issues of concern from local to global level, ground work in rural areas has been hampered by many modern trends. Stakeholders in agriculture development, poverty reduction and environmental quality must strive to change the rural communities, where most of the poor and the hungry are found rather than in the urban areas. Policies have to be established with a clear understanding of the grassroot situations in order for them to have relevance and impact at all levels. The situation in which rural people remain unaware of national plans and policies that influence their well-being has to change.

Through improvements in infrastructure, better linkages of marketing, movement and information flow between town and country must be achieved.

This paper, specifically from the Lake Zone, but by implication with reference to other parts of the country, has identified a number of specific weaknesses that impede reduction of rural poverty, improved environmental management, and the sustainability of rural livelihoods. There is much that can be done about all of them in this post-adjustment era when rural voices can better be heard, female rural voices especially. While this paper may appear to be pessimistic, it is also optimistic. Rural Tanzania is not in a disaster condition. Whether the 'millennium goals' as externally decreed can be achieved or not, within the time frame also externally decreed, there is scope for a great deal of improving change over the coming years.

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Building upon synergies to deliver the Millennium Development Goals:

Landscape-scale approaches to enhancing rural livelihoods, food security and environmental sustainability

Sara Scherr and Claire Rhodes¹

Introduction

The Millennium Development Goals (MDGs) mark an unprecedented drive by the international community to address the deeply interlinked challenges of eradicating poverty, enhancing food security and ensuring environmental sustainability. Despite the urgency of the Goals and repeated international commitments, progress towards their realization has been limited. The recent 2005 World Summit, held from 14-16 September 2005, served to reaffirm international commitment to deliver the MDGs and the overarching target of halving extreme poverty by 2015 through the adoption, by 2006, of 'comprehensive national development strategies to achieve the internationally agreed development goals and objectives, including the Millennium Development Goals' (United Nations, 2005²)

In view of this renewed global commitment, this article explores the opportunity of placing landscape-scale approaches to natural resource management at the centre of national development strategies, based on the rationale that inherent synergies can be delivered through enhanced co-ordination and integration between approaches addressing rural livelihoods, food security and biodiversity conservation at a landscape scale. This article highlights key recommendations that have emerged from a series of community dialogues on the role and capacity of grassroots practitioners to deliver the MDGs through integrated approaches to natural resource management³, as well as growing evidence of potential synergies that can be derived from combining, rather than trading-off poverty alleviation, food security and biodiversity goals within one set of activities (Brookfield et al. 2002; Scherr and McNeely 2003).

The need to jointly address the challenges of enhancing food security, environmental sustainability and rural livelihoods

The overarching objective of the MDGs is to halve extreme poverty by 2015. More than three quarters of the intended beneficiaries of the MDGs, the 1.1 billion surviving on less than \$1 per day, live in rural areas (MEA 2005). For

most of the poor, reducing poverty and hunger depends on their ability to sustain or increase crop, livestock, forest or fish production. At the same time, action needs to be within the framework of environmental sustainability. This is reinforced by recent conclusions of the Millennium Ecosystem Assessment, which emphasizes the impact of agriculture as the dominant land use. Agricultural expansion and intensification are now recognized as the main drivers of global biodiversity loss and ecosystem degradation (MEA 2005).

The significant overlap between those regions of the world facing the greatest challenges in achieving the MDGs on poverty reduction, food security and health, and those facing the greatest problems of ecosystem degradation shows the need for complimentary strategies to improve food security and livelihoods and to conserve biodiversity. Action is particularly critical within landscapes under agriculture production that are also essential for biodiversity and watershed services, highly degraded landscapes where improved agriculture, livelihoods and biodiversity all depend on ecosystem restoration, and landscapes in and around Protected Areas where local livelihoods depend upon agricultural activities.

'At a global scale, environmental degradation currently represents a major barrier to delivering MDGs, while the sound management of ecosystem services provides cost-effective opportunities for addressing multiple development goals in a synergistic manner' (MEA 2005).

While 'trade-offs' between biodiversity conservation and food security are still often perceived as the norm, there is growing evidence of diverse opportunities to realize synergies through landscape-level approaches (Brookfield et al. 2002; Scherr and McNeely 2003), particularly community and farmer driven approaches. These recognize and build on the depth and scope of extant expertise and knowledge amongst grassroots practitioners. Farming, pastoral, and forest communities are conserving natural habitats in millions of hectares within and outside public protected areas. Recent analysis of global land tenure trends indicates that at least 360 million hectares of forest and agroforest landscapes alone are under conservation management by communities (Molnar, Scherr and Khare 2004). Furthermore, at least 50 percent of the world's 102,000 Protected Areas (12 percent of the Earth's surface) have been established on ancestral lands of indigenous and other traditional peoples (Borrini-Feyerabend, Kothari and Oviedo, 2004). Conservationists and agriculturalists are working with farmers, forest users and pastoralists

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2. 2005 World Summit Outcome (15 September 2005)

3. Community Commons 2005; Community Shamba at the International Ecoagriculture Conference and Practitioners Fair (Scherr and Rhodes, 2005).

to develop landscapes that provide for production and conservation needs, complementing biodiversity conservation within Protected Areas with the management of surrounding agricultural landscapes to sustainably produce food while also seeking to protect wildlife and other ecosystem services.

Depending upon site-specific conditions, landscape-scale interventions may include:

- the integration of perennial trees, shrubs and grasses into crop or pastoral production systems to mimic natural vegetation and enhance ecosystem service provision;
- the use of unfarmed areas, forest mosaics and wetlands to develop habitat networks and connectivity that support or expand the habitat and range of wild species, including those with migratory patterns;
- the strategic placement of protected areas in rural landscapes in ways that take into account and benefit the needs of local farming, pastoralists and forest communities, enabling the livelihood, biodiversity conservation and economic benefits to be realized;
- utilizing organic and low external input agriculture, emphasizing locally adapted methods and traditional knowledge systems; and
- reducing or reversing the conversion of wild lands to production agriculture, forestry or aquaculture by sustainably increasing the productivity of land already under use (Scherr and McNeely 2003; Nairobi Declaration 2004).

An assessment by McNeely and Scherr (2003) of 36 diverse examples of ecoagriculture⁴ examples, found clear economic benefits for farmers in 28 cases, in a few cases doubling or tripling farm income; another five cases had a neutral impact on incomes while biodiversity benefits were high. In two thirds of the examples reviewed food or fibre supply increased. In 25 of these cases the principal beneficiaries were poor, small-scale farmers in developing countries. Enhanced ecosystem productivity and stability reduced production-associated risks, raised food and fibre production, and improved livelihood security. All of the successful cases demonstrated the importance of local organization to achieve impacts at landscape scale. The following three case studies exemplify the potential for such community-driven landscape management approaches. Each is unique in the socio-economic approach adopted, governance, stakeholder engagement and outcomes delivered, yet collectively demonstrate the inherent opportunities for synergy, efficiency and sustainability that can be derived from collective action at a landscape-scale.

⁴ Ecoagriculture (McNeely and Scherr 2002) defines an 'integrated framework' for managing agricultural landscapes to jointly achieve three goals: enhance rural livelihoods and reducing rural poverty; protect or enhance biodiversity (genetic resources, ecological communities, ecosystem services, wild flora and fauna); develop more sustainable and productive agricultural systems (including crops, livestock, forests, fisheries).

Sustainable indigenous peoples agricultural technology of the Kalinga Indigenous Peoples

For centuries, the sustainable indigenous peoples agricultural technology of the Kalinga indigenous peoples in the Philippines has supported local livelihoods and conserved mountain biodiversity through an integrated, landscape-level approach. Local communities manage their watersheds to ensure a continual supply of water for communal irrigation systems (PINAGWA system). Fish and vegetable production is integrated into the management of irrigated rice terraces. The work of the Kalinga indigenous peoples has created and rehabilitated over 150 hectares of integrated rice terraces. Additional protein is derived from an forest management system that explicitly relies upon forest conservation as a prerequisite for the sustainable trapping of wild animals. Forest protection, reforestation and maintenance have ensured 81% of intact forest in Kalinga Province and 72% in the Cordillera Administrative Region. Outreach and learning opportunities are strengthened through networking and policy advocacy, catalyzing further co-operation between local communities, government and the private sector.

Transboundary co-management of the Gandoca-Manzanillo National Wildlife Refuge

The Gandoca-Manzanillo National Wildlife Refuge stretches 30 km along Costa Rica's Caribbean coast, connecting with Panama's San Pondsak National Wildlife Refuge. This 25,000 acre refuge is co-managed by local communities, NGOs and government to protect an unusually diverse assemblage of lowland tropical ecosystems. Small farm agro-ecosystems play an integral role in this regional biodiversity conservation strategy. Over 300 farmers have land titles within the Refuge's buffer zone. Rural communities maximize environmental, economic and production benefits through sustainable agriculture and forestry production systems, locally owned ecotourism enterprises, biodiversity monitoring and conservation. The Asociación de Pequeños Productores de Talamanca (APPTA), a regional organic small farmers' cooperative, supports over 1500 small farmers to be successful in a competitive market. It is Central America's largest volume producer and exporter of organic products. APPTA has developed a local processing infrastructure for organic cacao and bananas, quality control checks, marketing strategies, and certification programmes. In addition to diversifying product markets, farmers receive an additional 15-60% revenue for certified products. Over 2000 smallholder farmers in Bocas del Toro, Panama also now receive certification price premiums. Carbon offset payment schemes for conservation are becoming an additional source of revenue for smallholders within the region.

Dryland restoration: community water harvesting in Rajasthan

Until recently, drought and environmental degradation severely impaired the livelihood security of local communities within Rajasthan's Arvari Basin. Crop failure,

soil erosion and watershed degradation were widespread, with communities facing a continual challenge to meet water needs. Twenty years ago, the Tarun Bharat Sangh, a voluntary organization based in Jaipur, India, initiated a community-led watershed restoration programme. The response was based on reinstating johads. Johads are simple, concave mud barriers, built across small, uphill river tributaries to collect water. As water drains through the catchment area, johads encourage groundwater re-charge and improved hillside forest growth, while providing water for irrigation, wildlife, livestock and domestic use. Over 5000 johads now serve around 1058 villages in the region. Community watershed management is co-ordinated through purposefully established village councils. The transformation in Rajasthan's social, economic, and biophysical landscape is evident, most notably in the restoration of the Avari river, which had not previously flowed since the 1940s. In turn, enhanced water availability has resulted in more sustainable agricultural practices, improved livelihood security and, overall, has strengthened emphasis on community-led natural resources management within the region.

Placing landscape-scale approaches at the centre of national development strategies

'A significant constraint to developing effective management is not purely attributable to a lack of knowledge and information concerning different aspects of ecosystems, but failure of decision-making processes to adequately recognize and use information that does exist, particularly traditional and practitioners' knowledge and innovation, in support of management decisions.' (MEA 2005)

As exemplified above, effective and sustainable landscape management strategies are context-specific, contingent upon a diverse array of local environmental, socio-economic and political determinants. The development of locally appropriate responses needs to be founded upon 'place-based' knowledge (MEA 2005). Opportunities to draw on this knowledge and support integrated landscape management approaches are often lost within current international and national development strategies. The bottleneck to delivering the MDGs lies primarily not in capacity, but in process. 'The world has the practical knowledge, tools and means to reach the Millennium Development Goals' (United Nations Millennium Project, 2005). The implementation of processes that effectively recognize and build upon this diverse capacity remains a crucial priority. Despite clear inter-connections between sectors, priority-setting and investment plans for rural development, agriculture and biodiversity typically remain 'stove-piped', with a lack of coordination between distinct ministries responsible for different elements of the same landscape. For example, environment ministries tend to remain distinct from agriculture, water, fisheries and forests ministries.

As the international community is challenged to develop and implement 'comprehensive national development strategies' (United Nations 2005⁵) to deliver the MDGs, this section proposes five potential entry points for national development strategies to build on existing landscape management expertise and strengthen the processes, partnerships and institutional frameworks necessary to mobilise and upscale this capacity. Recommended entry points reflect discussion and priorities articulated by diverse stakeholders working at local, national and international levels during the International Ecoagriculture Conference and Practitioners Fair (Scherr and Rhodes 2005) and the Community Commons (Community Commons Declaration 2005; Gillis and Southey 2005), while strongly aligning with key recommendations of the United Nations Millennium Project Hunger and Environment Task Forces, and the Millennium Ecosystem Assessment.

1. Enhance or, where necessary, restore traditional and indigenous knowledge systems by placing community-based leaders at the centre of capacity development and training initiatives:

A key recommendation of the UN Millennium Project to 'fast track' progress towards the MDGs is massive investment in capacity at a local level⁶ 'to ensure each community has expertise in health, education, agriculture, nutrition, water supply and environmental management'. Furthermore, the Millennium Project's Hunger Task Force⁷ recommends creating 'a corps of paraprofessional extension workers in agriculture, nutrition, and health, residing in villages identified as hunger hotspots'. While investment in capacity development at a local level is vital, action to deliver both recommendations should build on the diversity and depth of existing expertise at the local level, and recognize the key role that community leaders play in catalyzing effective peer-to-peer knowledge exchange and capacity development. As demonstrated by Brookfield et al. (2002), processes that facilitate peer-peer knowledge exchange and strengthen local leadership constitute an integral element of successful and sustainable capacity development initiatives. Additional international 2005 World Summit commitments

5 2005 World Summit Outcome (15 September 2005) Final document <http://daccessdds.un.org/doc/UNDOC/LTD/N05/511/30/PDF/N0551130.pdf?OpenElement>

6 Recommendation 5 of 'A Practical Plan to Achieve the MDGs' states that 'Developed and developing countries should jointly launch, in 2005, 'a group of Quick Win actions to save and improve millions of lives and to promote economic growth', complimented by the launch of 'a massive effort to build expertise at the community level. The massive training program of community-based workers should aim to ensure, by 2015, that each local community has: Expertise in health, education, agriculture, nutrition, infrastructure, water supply and sanitation, and environmental management, public sector management, and appropriate training to promote gender equality and participation. UN Millennium Project. 2005. The Millennium Project Report: Investing in Development – A Practical Plan to Achieve the MDGs. www.unmillenniumproject.org

7 UN Millennium Project Task Force on Hunger. 2005. Halving Hunger: It can be done.

on up-scaled investment in research and development to 'address the special needs of developing countries in the areas of health, agriculture, conservation and sustainable use of natural resources and environment' offers additional scope for directing investment to support community-led research processes that explicitly aim to build on the existing base of traditional knowledge, practices and innovations, directly addressing and responding to priority needs articulated by the intended beneficiaries of research investment themselves.

2. Create incentives and processes for collaboration between diverse conservation and agriculture stakeholders collectively responsible for managing a landscape:

Enhanced incentives are required to strengthen collaboration and integrated thinking amongst diverse stakeholders that depend and impact upon landscapes, for example, small and large scale farmers, pastoralists, community-based organisations, conservation, agriculture and rural development NGOs, research institutions, the food industry, policymakers and consumers. Multi-stakeholder processes are required to facilitate broader participation of land-use decision making and the negotiation of management agreements that reconcile multiple objectives with respect to ecosystems, livelihoods and productivity goals.

3. Invest in cross-sectoral institutions that support diverse stakeholders to manage landscapes:

Strengthening cross-sectoral institutional frameworks and supporting services that enable meaningful local stakeholder participation in land-use decisions and the negotiation of management agreements is an urgent priority. Although there is consensus around the importance of enabling participatory management processes, there are relatively few 'best practice' examples documented. A particular challenge in this area is the near absence of institutions equipped to support the transboundary management of resources of Protected Areas, biodiversity corridors, watersheds, coastal zones and other shared ecosystems. Most institutions influencing land and resource use at local, national and international levels retain a narrow sectoral perspective, with a structure and conceptual model based on the segregation of conservation and production functions. Few existing institutions are sufficiently inter-disciplinary and multi-stakeholder to address ecoagriculture issues across the full span from research to field investment to markets.

4. Enhance pro-poor market incentives, including products markets and payments for ecosystem services that reward conservation stewardship by resource users:

Market systems for agricultural products provide few direct incentives to support rural producers who are environmental stewards, with the value of ecosystem services stewardship rarely reflected in product price. Conversely, many intensive, ecosystem-damaging agricultural systems remain heavily subsidized. Worldwide, there is growing interest in the potential for markets and payments for ecosystem services as a means of catalyzing

the transition toward 'biodiversity enhancing' natural resource management, enabling rural producers to benefit from their stewardship of ecosystem services, particularly watershed protection, biodiversity conservation and carbon sequestration. Providing that local communities play an integral role in the design and delivery of such incentive mechanisms (Grief-Gran and Bishop 2004; Scherr, White and Kaimowitz 2004) ecosystem service payments offer scope for enhancing livelihood benefits derived from sustainable environmental stewardship. Such direct payment mechanisms are being increasingly complemented by growing consumer 'willingness to pay' premiums for equitable and sustainable production practices, through certification schemes for organic production, biodiversity conservation, and ensuring the rights of producers and local communities.⁸

5. Ensure appropriate legislative protection for natural resource ownership, particularly community tenure security and communal access to and control over land, forests and marine resources essential to livelihoods:

Secure access to natural resources remains a critical prerequisite for enabling sustainable community management. This requires the provision of clear property rights and tenure over the resources that are critical to sustaining livelihoods, especially land, water, forests, and fisheries, creating further incentives for long-term investment in sustainable management. Policy frameworks must ensure that community and indigenous peoples' **free, prior and informed consent** is secured by all engaged in development planning and decision-making. (For further discussion, see Millennium Hunger Task Force 2005; Molnar et al. 2004).

Conclusion

The promise and the reality of adopting landscape-scale approaches to natural resource management, such as those highlighted above, is that synergies can be delivered by **enhancing co-ordination and complementarity between existing** conservation and production strategies within agricultural landscapes. The key challenge lies in catalyzing the processes, investment and incentives necessary for mobilizing existing knowledge and strengthening co-ordination. The five recommendations provide potential starting points. This "snap-shot" does not reflect the depth, diversity and context-specificity of challenges and opportunities associated with taking forward each recommendation. Nonetheless, the processes underpinning the development of the recommendations (Community Commons Declaration 2005; Nairobi

8 For example, Social and Environmental criteria assessed in the Rainforest Alliance Agricultural Certification scheme include Ecosystem and wildlife conservation; Fair treatment and good conditions for workers; Community relations -- Farms must be 'good neighbours' to nearby communities, Integrated crop management; Conservation of soil and water resources; Planning and monitoring. www.rainforestalliance.org/programs/agriculture/certified-crops/nine-principles.html

Declaration on Ecoagriculture 2004) represent significant steps towards stimulating collaborative dialogue and action amongst the key stakeholders who need to be engaged in the design and delivery of national development strategies that simultaneously address the challenges of meeting rural livelihood, food security and environmental sustainability goals. This article aims to stimulate further dialogue and action, particularly on the integral role of *PLEC News and Views* readership in developing and delivering progress towards the Millennium Development Goals.

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Review Article

Writing about modern rural Africa: an essay around a review

Harold Brookfield

Q. Gausset, M.A. Whyte and T. Birch-Thomsen, eds, *Beyond Territory and Scarcity: Exploring Conflicts over Natural Resource Management*. Uppsala, Nordiska Afrikainstitutet. 2005. 218 pp. ISBN 91-7106-540-7. 220 Sek.

This essay began as an attempt to write a simple review of a book, which I found difficult. *Beyond Territory and Scarcity* arose out of an international seminar held in Copenhagen in 2002, with the object of seeking to move beyond Malthusian, neo-Malthusian and Boserupian discussion of people, agriculture and the environment. All the authors are European, and all are specialists in the anthropology or geography of Africa. All chapters but one, on modern change in Lesotho, draw on experience, some of it long, in inter-tropical Africa. The themes are discussed by the editors in the introduction, although the substantive essays deviate from them substantially. Although the book is not an integrated volume, it contains a wealth of information and ideas, which impinge also on other modern themes in writing about African farming and pastoralism, and about the African experience of modern development generally.

Agrarian crisis in Africa?

The prevailing view of African agriculture derives from statistics on production and population. Production of most crops and livestock has risen substantially but has failed to increase on a per capita basis. For the 'traditional' cash crops grown for export (cocoa, coffee, cotton, palm oil, groundnuts) the weakness is fairly well-established. Most of these crops have experienced substantial competition from Asian producers, and for all of them the prices have been weak, often made weaker than they should have been by the pricing policies of para-statal marketing boards. But the main problem concerns food crops. Any television viewer, or reader of the newspapers, can see the seeming ease with which a drought, or other natural disaster, throws whole countries into dependence on food aid. It is also often argued that farming has failed to supply the growing city markets adequately, leading to the need for substantial imports mainly of grains. It is very generally held, following neo-Malthusian as well as Malthusian arguments, that degradation of the environment, through 'inappropriate' soil-management practices, threatens the future viability of all and any agriculture in most African countries. A survey of the African environment produced by UNEP, written

by African authors, paints a picture of stagnant per-capita production and a dangerously deteriorating land and pasture base (UNEP 2002).

The statistics are, however, weak, since regular agricultural censuses are beyond the means of governments, and they depend heavily on quite crude estimates. The wide comparative survey of national statistics and local data from a selection of 26 small-area studies by Wiggins (2000), or the more restricted survey by Tiffen (2003), present a very different picture. Both criticize the poverty of the statistical base, find a far more optimistic situation at the local level, and find that the cities have been fairly adequately supplied, leading to a reduction of imports since the crisis decade of the 1970s. In Africa's most populous country, Nigeria, Guyer (1997) and Mortimore (in this book) acclaim the sustained success in provisioning the large and growing cities of Ibadan and Kano. What they, and also Toulmin and Guèyè (2005), show is the resilience and adaptive abilities of the African farmers, as well the success of widespread participation by rural people in intra-national trade.

The closest adherence to the basic problem posed by the editors of this book is by Michael Mortimore, who reviews the strong progress of agriculture in northern Nigeria and southern Niger, and emphasizes the resilience of African farmers. He analyses this through their dynamic knowledge systems, the flexibility of their livelihood responses to adversity, their adaptability to opportunities and their cultural values which have absorbed the individualization of the market economy without losing the strength of the extended family system through which Hausa organize their lives. Mortimore, like Tiffen, Toulmin and Guèyè, and many others, considers that African farmers have been very unfairly maligned in this debate. Arguing toward a Boserupian approach, he none the less insists he is an agnostic, since so much complexity defies any general model; it requires a social context.

PLEC in Africa

PLEC's work in Africa did not encounter such successful innovation as in these two cases, but it did encounter some excellent adaptive strategies for the management of soil and vegetation (Brookfield, Parsons and Brookfield 2003, Gyasi et al. 2005). In five countries farmers were oriented to the sale of their produce, receiving from 10 to 60 per cent of their income from sales either direct from the farm or in accessible markets. Near Arusha in Tanzania, and near Accra and Kumasi in Ghana, farmers had developed a wide range of diversified activities to supplement their crop incomes, and in one Tanzanian village these produced 60 per cent of total household income. In Ghana, our associates also found significant migrant settlement under share-cropping conditions that were quite onerous, but which permitted migrants from disadvantaged areas to grow crops

for the urban markets (Gyasi et al. 2003). One striking example was in the northern forest-savanna transition zone where intensively produced yams were the main marketed product (Asafo-Mensah and Oduro 2003). Near here in 2000, I saw great stacks of yams by the main road from the north, waiting for buyers to take them to Kumasi and Accra.¹ Even in near-urban communities where most men commuted daily or weekly to work in Kumasi, their wives maintained the farms and were active in marketing produce and in some innovative processing. PLEC came at rural development issues through the window of biodiversity conservation. It did so at the local level among the farmers, exploring the complexity, but got only some way into the social context. In particular, it only marginally explored the issues of livelihood diversification, which it did principally in the contrasted areas of near-urban villages in Tanzania and Ghana, and in an area with few marketing opportunities on the Fouta Djallon of Guinée.

By investigating how farmers manage their land to limit or avoid degradation, however, we were consciously opposing the neo-Malthusian farmer-induced degradation narrative of a great deal of modern science and government, the myths opposed by Leach and Mearns (1996), and earlier also by myself (Blaikie and Brookfield 1987). In the present book Wardell, re-interpreting his material on the history of the savanna forests in northeastern Ghana, shows how British and Ghanaian policy has failed to understand a situation in which the process is not one of unidirectional deforestation, but has included recovery of savanna forest in areas previously cultivated. These recovered areas are in fact much of the modern forest reserve.

Diversification and 'de-agrarianization'

On-farm and off-farm diversification of activities is widespread in all African areas where there is an available market. It has been common for many years, but has expanded since the downturn in economies that began in the 1970s, and since constant cash demands were created by introducing charges for school and health services under the structural adjustment policies of the 1980s and 1990s. To Bryceson (1996, 2002) this shift away from farm to non-farm activities and sources of income constitutes 'de-agrarianization', and the late-1990s studies which she coordinated found non-agricultural income to be providing 60-80 per cent of total household income at research sites in six countries (Bryceson 2002: 730). A multi-country survey by Ellis and Freeman (2004) found a wide range around an average split close to 50 per cent. Jayne, Mather and Mghenyi (2005) found significantly lower levels. Clearly there is scope for further convergence on what should be included in 'non-farm' and 'off-farm'.

'De-agrarianization' is a powerful concept, and one that has been adopted to describe the more comprehensive

diversification of rural and household economies in southeastern Asia, to the extent of proposing that 'no longer are the interests of the poor best served by supporting smallholder agriculture' (Rigg 2005: 182). In Africa, similar reasoning (supported by Tiffen's 2003 argument concerning the need to accelerate the rural-urban transition), leads Ellis (2005) to propose that pro-poor strategies should concentrate on the support of non-farm and off-farm employment and activity. It stands in opposition to the view that African farmers, as farmers, have a great deal to contribute to future prosperity, and that the smallholder family farmer is the proper focus of development support, and protection against low-cost food imports that are subsidized at source in the developed countries (e.g. Toulmin and Guèyé 2003, 2005).

Bryceson (2002) argues that the harsh medicine of structural adjustment has constituted the hinge that has forced increasing numbers of farm families to seek new sources of livelihood, but this seems an extreme view. In this book, Wardell, and also Batterbury in a comparative review of contrasted post-project histories in Burkina Faso and Mali, draw attention to the long history of activity diversification including labour migration, in these and other African societies. It is important to remember that herders have become farmers and entrepreneurs, and that a pluralist perspective is necessary in understanding all adaptations, historical and modern. Widening of opportunities has been a major element in African rural change since even before colonialism. The exploitation of rural people in Africa also pre-dates colonialism and still continues.

The political context

The complexity also requires a political context, and this is the partial or principal theme of about half the chapters in this book. In Senegal, Juul describes how 'environmental refugees' from the Sahel droughts have settled further south in the country, where they are legally free to do so. They were able to settle with caution on the fringes of the land of local pastoralists, taking advantage of the traditional free access to water by taking it from bores, initially in the inner tubes of the large tyres used on construction machinery and later in more secure vessels. Disputes certainly arose, and new settlers found themselves being charged for legally-free water and land. Disputes were often resolved by political lobbying and by the fact that innovative new grazing strategies proved advantageous to the resident people as well as the settler. She cites a comment by Agarwal (1998) on migration strategies of pastoralists in Rajasthan, India, noting that success in moving into or through an occupied area demands skill in finding 'one's way through a thicket of dynamic [land and water] property rights regimes.'

Such a thicket is also to be found in Darfur in the western Sudan, where land-grabbing by elites and officials has been added to Agarwal's maze of conflicting rights. In this book Menger shows how the dual existence of state

¹ My three Ghanaian companions not only saw these heaps but leaped out of the car to buy, at near-wholesale prices, enough yams to fill all remaining space in the already full car from the women sellers.

land legislation and customary tenure has been disturbed by administrative and quasi-administrative actions in which 'schemes have blocked pastoralists, grazing corridors do not function, and the legal system does not protect the rights of pastoralists....And the land grabbing goes on through the now dominant privatization policies'. Although he wraps his material in a discussion of the relevance of game theory to conflict resolution, he provides important background for those seeking to understand the current situation in Darfur.

The contribution of violence and greed

Fairhead, in the final chapter, goes to the Kivu region of the Democratic Republic of Congo, where the Second Congo War (1998-2003) was largely fought and which remains a disturbed region to this day. Fairhead's account is backed up by a large number of sources, including a U.N. Security Council report. In glossing and commenting on his challenging discussion, I draw on some of these, but give only the necessary minimum of up-dating citations. Fairhead puts weight on the problems due to external intervention, colonial or from other African countries, with international big business constantly in the background, and sometimes closer.

Kivu was first conquered by the Rwandans in the nineteenth century, who sought heavy taxation. The Belgians then saw this attractive upland region as an area for coffee plantation, and a national park. Appointing a young man who had greatly assisted them with requisitioning during the 1914-18 war to a position of supreme authority, and supporting him militarily, the colonial authorities managed to establish several hundred white planters, many of them on already-occupied land, and to supply them with coerced labour. After 1950 there were improvements, but conditions deteriorated again after independence in 1960. In the 1970s much land was taken over by the new ruling elite of the Mobutu regime, including the same man who had acquired supreme authority in the 1920s. Fairhead (p. 201) summarizes:

Until the 1950s, an alliance between the colonial administration (plus its army), the traditional chiefs (plus their police), the planters (plus their police) and the [national] park (plus their guards) was able, often illegally and corruptly, to appropriate land from cultivators, extort heavy taxes and corvée to build infrastructure, and recruit labour to work in the plantations. In the 1970s, these alliances were strengthened ...control passed to the new elite, then the old alliance between capital, state and traditional authority was forged once more.

New factors then entered the situation. Rebellion against Mobutu, under Laurent Kabila, continued in the east for several years, financed by gold production from South Kivu which was exported through Rwanda and Uganda.² When,

² The eastern Congo rebellion in support of the memory of Patrice Lumumba was among those visited by Che Guevara in his peripatetic search for rebellions to support that ended, tragically, in Bolivia in 1967. It is reported that he was very disappointed in the leadership.

in the 1990s, with the active participation of Ugandan and Rwandan forces, Kabila embarked on his successful invasion of the Congo from his base in the east, international mining companies were hastening to sign deals with him well before he had conquered the country (Montague 2002). For a complex of reasons, the new regime quickly fell out with its Ugandan and Rwandan backers, leading the latter to attempt its overthrow, an attempt thwarted by military support for the regime by armed forces of four other African countries whose reward was to be a share in the exploitation of Congolese mineral wealth. The second war was fought mainly in the east where groups supported by the Rwandan and Ugandan military established control over about half the country. Now the pattern of the self-financed regional uprising truly came into its own (as it also did in the same period in Sierra Leone in West Africa).

Large-scale mining in Congo remained 'on hold' during the war, and the mining in the east, and some of that in the west also, was by what are politely described as 'artisan methods'. Tools involved pickaxes, crowbars, spades and sieves; the location is in hilly country with considerable risk of miner-burying landslides. The minerals sought included gold, cassiterite and, most spectacularly the newly important columbium-tantalum ('coltan') which was in booming demand for the electronics industry in the late 1990s. By ill chance, a significant proportion of the world's known supplies are in the eastern Congo and adjacent areas along the western rift valley.³

The first miners were local farmers or their sons, seeking to diversify and enlarge their incomes, but they mined on land belonging to or claimed by large landholders, who charged big access fees and rapacious taxes on production. The rebel authorities in eastern Congo may initially have sought only the tax and sundry heavy charges on transit, but in a short time members of the armed forces and other militia groups entered more directly into production, recruiting labour—including prisoners and children—by coercive means. Looting of farm produce and animals, destruction of villages and farms, rape of women and murder of opposing parties, by 2003 led to the effective 'de-agrarianization' of big areas in the eastern Congo. After 2000 shortages of food for the miners and militias led to poaching of wildlife in the national parks. By best estimates, between three and four million of the eastern Congo people died, many through starvation or disease rather than by direct violence.

Although a settlement reached by 2003 led to withdrawal of most foreign soldiers and to the incorporation of the main rebel groups into a new national government,

³ Tantalum, the principal product, is a grey-blue metal twice as dense as steel, with a high melting point, highly workable and ductile. It has many industrial uses, but the most important property is its high super-conductivity enabling storage and release of electrical charges. This makes it particularly suitable for use as capacitor in small electronic products including laptop computers and mobile telephones. The boom in production of these instruments exceeded the capacity of regular suppliers in the 1990s, leading to a steep price increase which coincided with the Second Congo War (Hayes and Burge 2003).

violence did not cease. In the new northeastern province of Ituri, created under Ugandan administration, an old-fashioned conflict over land, which was now also a conflict over mining land, broke out between the farming and pastoral groups. This in turn involved all the same violence, exploitation and destruction as earlier in Kivu and it even grew worse into 2005 (Médecins sans Frontières 2005). By late 2005 the welded-together national army declared its intention to crush the militia groups, but the latter had meantime combined forces to sustain their taxing and mining interests. The miners are still local young men, but they work for warlords or in some cases small companies, and their ill-rewarded labour is not freely engaged. Of all participants in the mining business, they get the least reward. By a significant margin, this war has been the most violent of Africa's numerous post-colonial wars and rebellions. All have, at least temporarily, 'de-agrarianized' large areas of the continent, yet the remarkable fact is that most regions have recovered once peace was re-established. Once again, the resilience of the African farmer and farm economy should not be under-estimated.

Conclusion: wider opportunities

The widening of opportunities is – even in Kivu and Ituri once full control is restored and the industry better regulated – an important and generally positive part of African development (Hayes and Burge 2003). Non-farm opportunities open the way to new paths for rural Africa, not to the end of all farming. Widening of opportunities is the way to the future, as it has been in other parts of the world. At the end of this quasi-review, it is important to say that this is a rich small book and its authors cut down many simplistic notions derived from grand, or not so grand, theory. It is part of the construction of a new understanding of rural change in Africa.

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