PLEC-Tanzania Technical and Policy Recommendations for sustainable agrodiversity management (with modifications from meeting participants)

Kaihura F.B.S, Rugangira, D.M

What is PLEC

PLEC stands for People, Land Management and Environmental Change. It is a global project on " AGRODIVERSITY" implemented by the United Nations University.

Smallholder farmers throughout the tropics have been adept at using the natural diversity of the environment for choosing their crops for managing the soil, water, land and vegetation, and for production. Arguably, they have conserved more biological diversity and more economically important species than all protected areas combined. They have systems of land use and practices that have stood the test of population growth and environmental challenge. There is a large untapped source of knowledge, which could potentially contribute to (1) conservation of biological diversity, (2) protection of importance systems of land use, (3) control of land degradation, and (4) food security and livelihood. PLEC calls this agrodiversity 9 see also appendix 1). It shows how agrodiversity not only supports global objectives towards conserving biodiverisyt but also supports human needs and development. About 200 scientists and hundreds of collaborating farmers are discovering just how and why agrodiversity is important and worth promoting for a future sustainable earth. In Tanzania, the project works in sub-humid and semi-arid areas of Arumeru, Arusha since 1998.

The goal of PLEC

The project goal is to develop sustainable and participatory approaches to conservation, especially of biodiversity within small farmers agricultural systems and in participation with the farmers.

The specific objectives are:

To establish historical and baseline comparative information on agrodiversity at the landscape level in representative diverse sites;

To develop participatory and sustainable models of biodiversity management based on farmers technologies and knowledge within agricultural systems at the community and landscape levels;

To recommend approaches and policies for sustainable agrodiversity management to key government decision makers, farmers and field practitioners.

The principal project activities to meet the above objectives included:

Establishing demonstration sites and engaging in primary data gathering by villagers and scientists working together, assembling social data and identifying successful resource management patterns.

Jointly with farmers carrying out on-farm experiments and monitoring to analyze, measure and compare resource management methods and technologies, and seek improvements.

Holding outreach and awareness workshops on in-situ agrobiodiversity conservation.

Integrating scientific and community social and agricultural information, and presenting findings at village, district, national and cross country workshops involving decision makers, and

Organizing and supporting the training of farmers, extensionists, local officials and students, creating client and stakeholder involvement which will ensure the sustainability of PLEC actions.

While objectives 1 and 2 have been achieved substantially in the project area, objective 3 has been dealt with at village and district levels only through stakeholder and farmers workshops and feedback meetings. Several recommendations relevant at individual farmers and community level are currently under implementation with expert farmers and professionals supervision. This meeting aims at presenting approaches and policies for sustainable agrodiversity management developed jointly by stakeholders, farmers, extension staff and researchers to national level policy

and/or decision makers to consider mechanisms of their inclusion into national policy at different levels of implementation.

Technical and Policy Recommendations

During the period March 1998 and January 2002 annual project workshops and six months feedback meetings to PLEC farmers and other stakeholders in Arumeru were conducted. After every workshop or feedback meeting a number of specific observations and recommendations were developed. Some of those that needed implementation at village and district levels are currently under implementation. Those that need to be incorporated into national plans and/or budgets were left to policy makers for consideration.

A: Technical Recommendations

1. Climatic change.

Rainfall data analysis 1953-1997 for Arumeru district indicated a general decrease in total rainfall, length of growing seasons and changes in on-set and cessation of rains. The findings were also supported by the farmers that drought occurrences and length of dry seasons had increased. It was recommended that:

1.1 A national strategy be developed to create awareness to all farmers and land users of the trend based on such studies. Alternative strategies to cope with the situation also be outlined. Awareness about deep ploughing for soil moisture conservation and availability of appropriate implements be created

In order to promote farmers' developed techniques, deliberate efforts be taken to first document what farmers are doing and work towards their improvement. Water harvesting techniques and deep ploughing experiments with and without manure increased maize yield by over 30% compared with farmer practices. The techniques were recommended for adoption in semi-arid environments. Current farmers coping strategies include: use of locally developed drought, pest and disease tolerant seeds with many other multi-purpose uses; diverse cropping systems, area/farmer specific crop rotations, traditional irrigation systems, etc.

1.2 Farmers' initiatives in biodiversity conservation and rehabilitation of degraded lands be recognized, supported and rewarded at all levels. National institutions that are immediate beneficiaries of farmers conservation initiatives (e.g water use from catchments by Tanzania Electrical Supplies Company (TANESCO), the National Urban Water Authority (NUWA), and wood industries should be bound to return some of these benefits to rural communities as incentives and use for rural community development. Specific reference was made to: conservation of water catchments, natural forests, wetlands, lakes, hot springs and game reserves. In addition, natural forests conserved by government should also benefit villages surrounding them. The prevailing situation is that business people exploit these forests by paying elsewhere and leaving nothing to the villages which keep a close watch on them.

1.3 Current practices of clearing natural forests and planting commercial forests be condemned. Afforestation be directed to free land facets. Deliberate large scale afforestation efforts of semi-arid lowland environments with particular emphasis on indigenous trees also be initiated by responsible institutions. The potentials of indigenous tree species and pastures particularly with respect to biodiversity conservation, fertility restoration, erosion control and their use in agroforestry

systems be emphasized. Most afforestation programmes in Arumeru are directed to humid and sub-humid areas and concentrate on clearing natural forests. This reduces biodiversity and agrodiversity benefits in small-holder farms. Also established plantations should avoid monocultures and include indigenous trees in established plantations.

1.4 Conservation of established woodlots at household level be encouraged and strengthened. Both indigenous and exotic tree species be planted. Woodlots have shown to be more reliable in income generation and agrodiversity conservation especially in semi-arid environments than crops. They also serve to feed both people and livestock and conserve agrodiversity.

1.5 Following unreliable weather forecasting at national level i.e. In some cases a good rainy season is forecasted and farmers respond accordingly but to be disappointed by unexpected droughts during the rainy season and vice versa. Also recognizing that rainfall recording stations are very few, most of them not well functioning, recommended more modern and efficient recording stations to be established at selected schools, churches and hospitals in addition to current ones. Also that recorders be trained to take timely and correct data. Adequate meteorological stations with functional equipment be installed in each district.

1.6 Current weather forecasting by radio does not reach the majority of small-scale farmers. Pamphlets be available for distribution through different media e.g. church gatherings, public meetings, schools and hospital areas, be used in order to reach the majority of the farmers in need of weather information. The meteorological department should also send information to other ministries headquarters to assist in spreading the messages.

1.7 People should change eating habits and promote utilization of drought tolerant crops like sorghum, millet, cassava, sweet potatoes for food instead of maize. Some of these crops were grown before but disappeared. Research should closely interact with farmers to document and include farmer desired qualities for improved seeds in their breeding programmes (e.g. taste and colour of Loshoro for Waarusha and

Wameru). Drought tolerant improved seeds and local potential seeds and appropriate cropping systems were recommended for the semi-arid zones.

2. Soil fertility improvement and biodiversity

Observed that soil fertility in densely populated areas of Arumeru depends on nutrient imports from support plots through transfer of crops and crop residues. However support plots are seldom well managed. Some are in semi-arid erosion prone areas and face loss in biodiversity and fast land degradation. It was recommended that:

2.1 To restore soil fertility and biodiversity loss in degraded lands, conservation farming and use of fertilizer inputs be recommended as a prerequisite to obtain/retain such plots. Leguminous plants may be used to strengthen physical conservation structures of support plots especially on steep slopes. Both conservation farming and integrated soil fertility management programmes be launched for sustainable production of support plots in Arumeru and all densely populated areas elsewhere. The programme should include among others: effective use of crop residues, use of leguminous cover crops like mucuna spp and Ng'wara, N2 fixation through cereal/legume inter-cropping or mixed cropping, agroforestry techniques and proper uprooting of legume stovers from farms.

2.2 Indigenous trees and pastures be used in fertility restoration and rehabilitation of degraded lands as a fertility restoration and indigenous agrodiversity conservation strategy for main and support farms.

2.3 By-laws be established at community level addressing positive use of manure and role of extension staff. Rewarding for planting of trees of biophysical significance and biodiversity enhancement be developed as an incentive to effective use and management of natural resources. Alternatives to gully plugging using manure and piling of ashes after burning manure or piling manure along roadsides be discouraged through district sustainable resources management programmes implemented through existing NGOs and extension staff.

2.4 Indigenous technologies of shifting of family houses, cattle pens and toilets, crop rotations and cropping systems for fertility improvement be well studies. Promising elements be improved to be more scientific and effective.

2.5 Use of industrial fertilizers is mandatory if improved seed and proper crop husbandry practices of pests and weed control are used to increase production. However farmers are inconvenienced by the structural adjustment policy that removes subsidy on inputs especially for small-scale farmers whose purchasing power is very small. Government should initiate and finance rural development projects that aim at increasing small-scale farmers income and biodiversity as initiated by PLEC to enable them invest in sustainable agriculture.

3. Indigenous Technologies their development and transfer.

PLEC recognizes farmers indigenous knowledge and associated diverse and dynamic coping strategies in resources management and production. In addition both realize that rural livelihood and food security has greatly depended on experience and knowledge of these farmers. Unfortunately most successful indigenous resources management skills are known by the elderly. No documentation is available for reference to the future custodians of the land. In addition, female farmers who are the actual land managers despite accumulated knowledge and skills, have received tittle attention either in training others or being trained for improvement. It was recommended that:

3.1 Expert or skilled farmers be empowered and facilitated to undertake farmer training programmes. Focus be put on successful resources management modules that comply with area specific farming/cropping systems and conserve biodiversity. Researchers should also be trained to understand expert farmers production systems and integrate these modules with scientific methods for their improvement. In this process both researchers and extensionists facilitate the process.

3.2 A system of transfer of indigenous knowledge from older to young generations be established and reinforces. The names of different types of soils, indigenous soil quality indicators, uses of different shrubs, trees and grasses are some examples. The process may include documentation and incorporation of indigenous knowledge of resources management in primary and secondary schools. The government may also consider financing income generating and biodiversity enhancing activities in the rural communities that will occupy young farmers and prevent them from moving to towns. Such activities have been initiated by PLEC in Arumeru.

3.3 Temporal and spatial changes in resources management and their effects on agrodiversity and environment be taught in schools at all levels.

3.4 An element of gender balance should be incorporated in community development and resources management programmes at all levels from household to national.

Support of women groups for agrodiversity enhancement and conservation be initiated though existing NGO rural development programmes. To be successful expert women in resources management should pilot the process.

3.5 Formulation of different self managing and financing groups in the villages be initiative especially for women. Each group (e.g. women and environment group) be focused to address a single environmental management activity that contributes to agrodiversity and increases peoples' income.

3.6 Expert farmers be recognized and given chances to show agricultural products coming out of their own initiatives towards agrodiversity enhancement and conservation. Their exhibitions should cover both agricultural, livestock and forestry products, successful resources management models, etc. the current practice is that they are invited to see what others have done and adopt if they can.

3.7 The government should seek markets for diverse crops produced as an incentive to farmers agrodiversity management. The pricing mechanism of farm products should be harmonized to encourages farmers initiatives.

4. Linkage

Observed that the current research extension linkage is weak and that outreach programmes, seminars and workshops were better linkage tools in technology development and dissemination but expensive. Most research outputs remain as office documents and never reach farmers, despite the long time Farming Systems Research (FSR) approach. Also that farmers even those in the closest neighborhood to research centers, do not know what research is doing. As a result farmers also carryout parallel research on their own farms to address their production problems. Such work, most of which is useful is neither documented nor shared with neighboring farmers nor researchers. The stakeholders also noted that most extension work is adhoc. It was recommended that:

4:1 The government finances outreach programmes for farmers, researchers and extension staff to enhance continuous interactions of experts for focused, and cost

effective joint research and technology development for both on-station and on-farm research.

4.2 In rural technology development and dissemination, expert farmers be empowered to lead the process with researchers and extension staff facilitating the process.

4.3 District and villages leadership be positive and give support and necessary information to extension staff in their respective villages of operation. Besides, the leaders avoid assigning them non professional assignments that undermine their linkage and extension activities such as levy collection.

4.4 Farmers, extension staff and researchers collaboration and continuous interactions be maintained as is the case of Arumeru under PLEC. However in order to manage all parties should be facilitated and motivated to do so.

4.5 Farmers, relevant stakeholder and extension staff jointly develop their extension staff workplan at least on quarterly basis. All involved parties to respect that workplan and that appointed authorities monitor achievements and address setbacks during implementation.

5.0 **In and out migrations**

Observed that in densely populated areas like Arumeru, farmers are advised to move to identified free lands like Kiteto. However there are usually no prior arrangements for land use planning of the identified new lands and other arrangements. Some farmers had to come back or live with a lot of difficulties. It was recommended that:

5.1 For any parts of the country potential for accommodating in-coming occupants, there is need to carry out an evaluation of the land and establish a land use plan for the expected occupants. In addition farmers need to be trained on the potential and constraints before working on the new land.

Access to agricultural inputs and advisory services on inputs use

Despite existence of agricultural inputs services like shops in towns farmers face problems of reaching town in time and identifying shops that render proper services (e.g. the right inputs they need like seeds, fertilizers, pesticides, insecticides etc.) and proper guidance on their proper application. This includes application of manure a readily available input in semi-arid environments. They do not have any indications on prices. In most cases salesmen of agricultural inputs give wrong information on the use of inputs to farmers. In some case inputs recommendations like spacing do not conform with local cropping systems. It was recommended that:

6.1 The government bring agricultural inputs services closer to farmers, preferably village centers. Alternatively NGOs and inputs stockists be sub-contracted to provide soft loans on transportation of agricultural inputs to villages. Packing should bear in mind the purchasing power of the farmers and prices should be known. Salesmen and women should have an agricultural training background to help farmers in getting what they need, provide correct directions of their application. Dealers in agricultural inputs be advised to prepare brochures of the most common inputs used by farmers that give details of application. The government should increase the budget for the Ministry of Agriculture and Food Security to embark on training farmers on the uses of different inputs. Farmers complained that much as they are advised to use fertilizer, they cannot differentiate between Tripple-superphosphate and Calcium ammonium nitrate as an example.

6.2 As is the case in awareness creation to the farming community with respect to onset of rains and timely planting, awareness creation be extended to include information on timely application and incorporation of inputs like manure and compost and their best management for increased yields particularly in semi-arid environments.

6.3 Distributions of maize seed should bear in mind cropping systems of regions they serve seeds. In Arumeru for example maize is always inter-cropped with beans. Recommendations   on   spacing   should   take   that   into   account.   Spacing

recommendations for maize alone have forced farmers in Arumeru to embark on research to establish a proper inter-cropping spacing.

B: Policy Recommendations

8.0 Implementation of several CBD articles:

Aware that Tanzania ratified the Conservation on Biological Diversity (CBD) in 1994. The convention promotes conservation of biological diversity, equitable sharing of benefits derived from the use of genetic resources, and the sustainable use of its components. For the convention to be operational in each country, policies and legislation for its implementation need to be put in place. It was learned that Tanzania has not finalized policy and legislation formulation regarding implementation of the convention in general and the relevant articles like the Intellectual Property Rights (IPR), Access and Benefit Sharing (ABS) and Genetic Resources (GR). It was also noted that current national policies e.g. National Environmental Policy of 1997; the National Land Policy of 1995 and the National Agricultural and Livestock Policy of 1997 do not mention anything on agrodiversity.

Aware also that there has been a lot of government initiatives towards environmental management and biodiversity conservation. These include: Establishment of the National Plant Genetic Resources Committee; The 1990 Plant Genetic Resources and Biotechnology workshop recommendations; The 1994 National Environmental Action Plan; The National Environment Management Act No. 9 which established the National Environmental Management Council and the establishment of the national Commission for Science and Technology (especially its national research clearance committee) to mention a few. However the process of legislations to implement several of the CBD articles has not yet been completed. Farmers expressed concern that they are among the most disadvantages as their indigenous knowledge and practices and indeed indigenous genetic resources are being exploited without control. Various technologies developed by local farmers in the use of indigenous trees species to control pests and diseases in crops and livestock was a case example whereby outsiders are seeking for details without any

control or benefits to farmers. There are no conditions for access or transfer of knowledge to the outside.

Agrodiversity was observed by PLEC and stakeholders to cover more than just monitoring, and conserving biodiversity. It takes into account the people who manage the diversity, the management systems, the biophysical environment on which plants grow and organizational aspects influencing the conservation and management. Indeed it supports human needs and development. It was recommended that:

8.1 Government be advised on the necessity to create/strengthen village committees on environment and enhance awareness concerning the Convention on Biological Diversity (CBD). This will facilitate policy implementation in aspects of PGR, ABS and IPR. End users of environmental conservation products like water, timber, wildlife etc, should be able to pay back part of the earnings generated to the farmers as incentives.

8.2 A national database on biodiversity be established and shared between relevant ministries. That the national database be set and managed by the Department of Environment, Vice Presidents Office. The format and methodology for data collection be harmonised and distributed to institutions in need. All national projects on biodiversity be required to contribute to this database.

8.3 At community level village governments establish by-laws to protect small-scale farmers' indigenous knowledge and practices. Also establish legislation to support community based decisions and by-laws in agrodiversity conservation, particularly those associated with access and benefit sharing. Established village by-laws should be recognized by the central and local governments to ease enforcement.

8.4 Special attention be paid to understanding and documenting farmer desired qualities in breeding of improved seed and other germplasm. Botanical gardens be revived at all research and training institutes where all traditional crops, livestock, indigenous agroforestry trees and pastures will be maintained and re-introduced in

modern land management and cropping systems to enhance lost agrodiversity. The process should include recording and monitoring individual farmers botanical gardens wherever they are.

8.5 The government be advised on the necessity to support and facilitate farmers knowledge exchange mechanism in sharing and dissemination of agrodiversity. Through a well managed database of the various local seeds kept by farmers, they will be able to exchange from one area to another. Current importation or transfer procedures constrain on-farm agrodiversity enhancement and conservation. Researchers should also recognize and utilize farmers indigenous knowledge.

8.6 For purposes of mainstreaming, the government should strengthen cross-sectoral multidiscriplinary biodiversity/agrodiversity coordination groups to be established or existing ones be expanded to include agrodiversity professionals in addition to administrators to fasten the legislation process and monitor implementation of established legislations.

9.0 Implementation of the OAU model law

The Organisation of African Unity's Model Law of 2000 (currently African Union-AU) was developed for the protection of the rights of local communities, farmers and breeders; and for the regulation of access to biological resources in order to protect Africa's common biological diversity and the livelihood systems dependent on it with a common tool. It provides the necessary framework for member states of the AU to draft out specific national legislation consistent with their political orientation, national objective and level of socio-economic development. This is because the growing forces of global trade are seeking to secure monopoly control over Africa's valuable biodiversity, knowledge and markets through the guise of global and bilateral trade agreements which are intrinsically unfair. The AU council of ministers specifically recommended that African countries develop national laws, as well as regional regimes and common negotiating positions in international law and related issues to protect Africa from this onslaught. This legislation enshrines the right to continue living according to ecologically coherent practices and to establish a boundary beyond which monopolies cannot penetrate.

Reference is made from the January 1999 African Regional Workshop on Understanding Biodiversity Related International instruments regarding benefit sharing and genetic resources.

The Convention on Biological Diversity assumes that when a state allows access to a sample of genetic resources, it is in return entitled to insist on a number of benefits. Research activities on the genetic resources that country provides have to be done in its territory to help that country build capacity. All the information generated by research on that genetic resource is subject to be repatriated. Any biotechnology applied on the genetic resource must be accessible to the country that provided the genetic material. A fair and equitable share of benefits accruing from the use, including from commercial gains of the genetic resource must also be given to that country. But all this is conditional upon a mutually agreed contact. To our understanding, there is as yet no African country with the appropriate legislation to cover such contracts.

The industrialised countries know this, and many of them have been undertaking many expeditions to Africa to collect genetic resources before African countries wake up to enforce their sovereign rights over these resources. As usual we wake up after the thief has taken what he wants and has gone away. It was recommended that:

9.1 The OAU model framework be used to develop legislations appropriate and in favour of the custodians and managers of biodiversity in Tanzania i.e. The rural communities, farmers and breeders.

9.2 A cross-sectoral team be established to develop effective *sui generis* systems or a combination to protect plant varieties and livestock breeds and other materials of the kind from open exploitation. Specifically the problems associated with lack of legislation of the informal seed sector (e.g. farmers' varieties and breeds) versus commercial sector (e.g. improved varieties/breeds) be addressed. Zimbabwe for instance could be an example to emulate where by country standards have been developed to qualify local varieties. Local seeds developed, widely used by farmers and with locally desirable potentials that meet locally set standards are termed *"Quality declared seed" versus "certified seed".*

9.3 Farmers own local seeds selected and tested overtime and with widespread use, be recognized officially in accordance with national or zonal set standards for "*quality declared seed*", multiplied and further studied to become sources of desirable traits in breeding for certified seeds.

10. **Support of poor farmers conservation of biodiversity**.

Learned that highest biological diversity was on poor farmers fields than on rich farmers. Also that fragile semi-arid environments had richer biodiversity than less fragile humid and sub-humid environments. Endangered species are also mostly regenerated by poor farmers. However less attention was paid to both fragile environments and poor farmers particularly in semi-arid environments in support of their endeavors in environmental and biodiversity conservation. It was recommended that:

10.1 The government be advised to recognise and support poor small-holder farmers efforts of conserving biodiversity and regenerating degraded environments in semi-arid environments. PLEC observed that funding has mostly been directed to agriculturally potential areas where research and demonstration will obtain quick

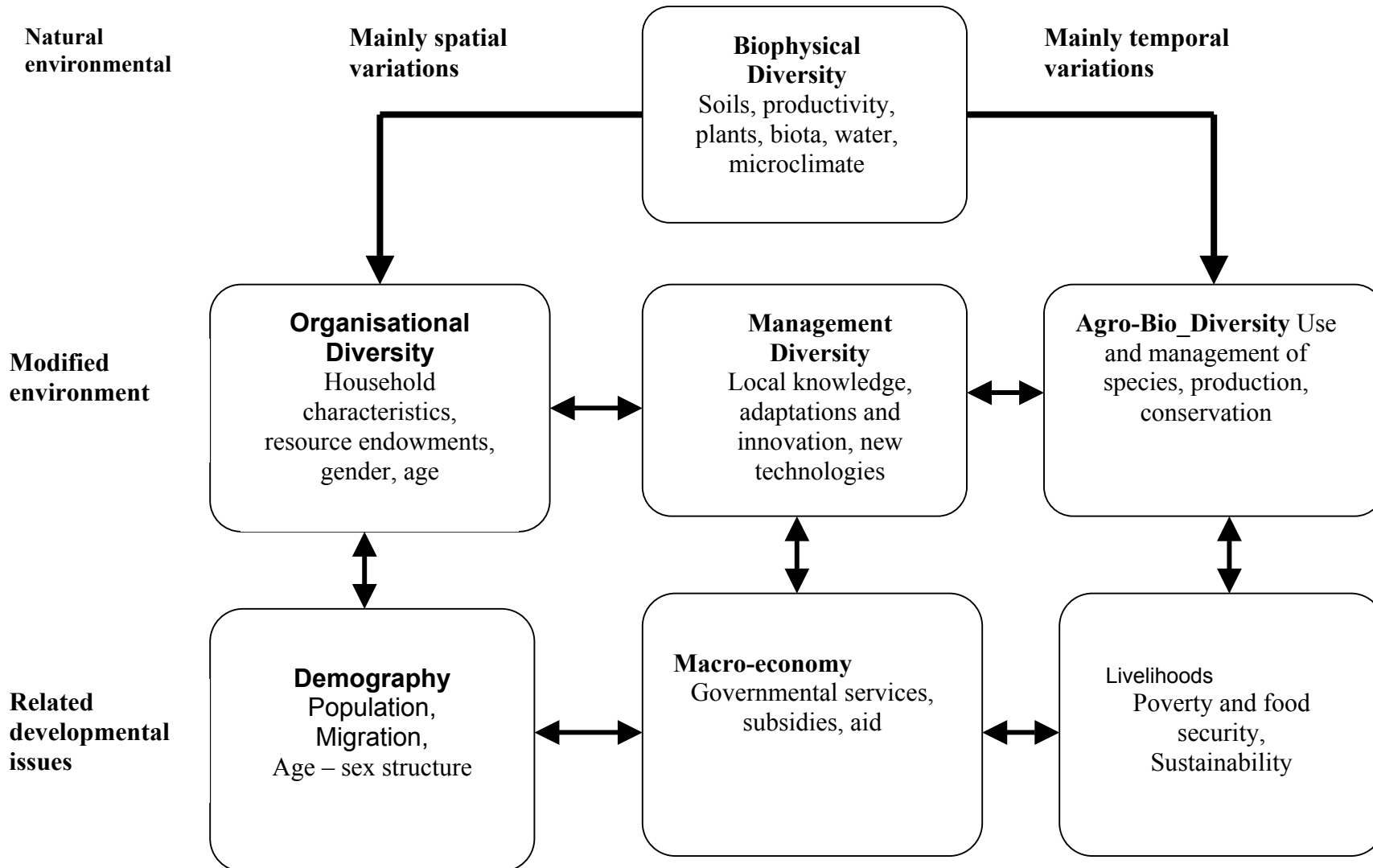results. There is need to pay more attention to farmers in semi-arid environments than present situation.

10.2 A greater percentage of farmers in Tanzania depended on traditional varieties and ecosystems than hybrids and industrial systems. While working on improved methods to increase productivity and production, traditional ecosystems than hybrids and industrial systems. While working on improved methods to increase productivity and production, traditional ecosystems management should be well conserved and consulted as a major source of inputs in breeding for improved breeds and developing improved management methods.

10.3 Due to lack of documentation and in depth studies of the potentials of indigenous trees, fodder, pastures and local animal breeds, current programmes on environmental conservation and rehabilitation of agricultural lands emphasize use of exotic trees, fodder and pastures. They ignore or are not aware of the potential of indigenous species with regard to fertility restoration, land rehabilitation and use in agroforestry systems. Documentation and studies of indigenous species and their role in environmental conservation be initiated. Farmers also been encouraged to use indigenous trees in combination with introduced trees in forests, farms and pastures both on individual and government lands and farms.

10.4 By-laws be developed by rural communities on conservation of biodiversity through appropriate management of indigenous and planted woodlots. Woodlots are a potential source of income especially in semi-arid environments with unreliable rainfall.

Appendix 1. Elements of agrodiversity – main components and principal development issues

Natural environmental	**Mainly spatial variations** **Biophysical Diversity** Soils, productivity, plants, biota, water, microclimate **Mainly temporal variations**	

Biophysical Diversity
Soils, productivity, plants, biota, water, microclimate

Modified environment

Organisational Diversity
Household characteristics, resource endowments, gender, age

Management Diversity
Local knowledge, adaptations and innovation, new technologies

Agro-Bio_Diversity Use and management of species, production, conservation

Related developmental issues

Demography
Population, Migration, Age – sex structure

Macro-economy
Governmental services, subsidies, aid

Livelihoods
Poverty and food security, Sustainability

Developing Policy and Technical Recommendations for Agrobiodiversity conservation:
The PLEC – Uganda experience

Joy K. Tumuhairwe, C. Nkwiine and J.B. Kawangolo

Abstract:

Four years PLEC work in Uganda revealed that most people including government officials did not consider agrodiversity conservation as important. That agriculture and environmental matters were low ranking in developmental plans and budgetary allocations. It was recommended that the government should facilitate agrodiversity experts carryout sensitization campaigns to the general public and farmers to demonstrate good practices that promote agrodiversity conservation.

Background

One of the objectives of UNU/PLEC project was to establish sustainable approaches to biodiversity conservation within agricultural ecosystem. To measure sustainability of an approach and how to ensure its sustainability is not easy in the short run. However, practical indicators include its acceptability by the farmers and other stakeholders.

Acceptability is implied in the willingness of farmers to experiment on the technology, to tell others about it and, in case of decision makers and field practitioners, the willingness to incorporate recommendations from such experiments, into their decision making tools and implementation strategies.

Involvement of all stakeholders including farmers in technology development, testing and dissemination is PLEC's strategy to ensure sustainability of the developed technologies/approaches.

Developing policy and technical recommendations derived from the four years development processes is not only another way ensuring sustainability of the developed approaches but also a means of facilitating their wider adoption and utilisation.

The purpose of this paper therefore is to share experiences with fellow scientists in presence of government officials, farmers and other stakeholders, for betterment of the final outputs of the three EAPLEC clusters

Rukungiri

Hilly And Maountainous Areas Of Uganda Include The Following:

a) District in (a) Western and SW region: Bundibugyo, Bushengi, Kabale, Kabarole, Kisovo, Southern parts of Mbarara

b) Eastern region: Ntungamo , Kapchoywa, Karamoja, Mbale

Problems Of Agricultural Biodiversity In Hilly Areas:

1) Fragile ecology:

   High altitudinal range (Bushwere : 1500 to 1800 Masl); Extremely steep terrain 15-60% Slope

2) High population density and growth rates causing:

   Overcultivation, Land fragmentation, Mosaic gardens on hills

3) Over dependency of population on it for:

   Food, Income, Fuel. Therefore the agroecosystem is very susceptible to degradation

Government Response:

- Has a leading role to play in conserving Agricultural biodiversity

- Uganda government is a signatory and contracting party of CBD – and has gone further to Biodiversity Con. Action Plan unfortunately the current policy and action plans do not emphasize conserving the diversity of biological resources per se. Focus is on increasing production, diversification for broadening economic base and proper soil and crop management for high yields.

- National Environment Management Authority NEMA – is an implementing arm of government on Environment Management biodiversity inclusive but does not mention Agrobiodiversity at all. Even the regulations on managing hilly and mountainous areas, stipulated in the Environment statute are not implemented
  NEMA is represented at district level and plans to set up local environment committees at grass root level

- Government has a Plan for Modeniation of Agriculture (PMA) as strategy for the Poverty Eradication Action Plan (PEAP) – commercialisation; - Modern farming methods.

PLEC Findings at Bushwere:

- High enthinic diversity - People deliberately conserve several species for direct food, socio-economic and cultural benefits

- High agricultural biodiversity still exists. However,

- Managers of biodiversity need:

- Policy guidelines on Agrobiodiversity are lacking in the available Government documents (even the unpublished Biodiversity Conservation Action Plan)

- Local leaders at grass root level lack access to legal and technical tools for effective sensitization, decision making and policy implementation

- No database of agrobiodiversity in the country except that of PLEC:- hinders planning for monitoring and assessment of this valuable resource.

- Agrobiodiversity being a multi-functional resource Agriculture, environment, forestry, economic planning and industry requires proper sensitazation of their respective stakeholders for better coordination of people working in these ministries

Goal:

Develop policy strategies that integrate the objectives of agricultural production and environmental protection through land-use practices that conserve and sustainably manage agricultural biodiversity.

Objectives:

a) To raise main policy issues and suggest a national policy framework for sustainable use of agricultural biodiversity and its conservation.

b) Avail technical guidelines for making agrobiodiversity conservation clearly beneficial and attractive to rural communities

c) To enhance accessibility of tools (legal and technical) for effective sensitization, decision making and policy implementation.

d) Advocate for establishment of a national agrobiodiversity database and mechanisms for its regular monitoring and assessment.

e) To provide technical guidelines for arresting and/or reducing erosion of agricultural biodiversity and other related land resources like soil and water.

Summary of important activities done in developing recommendations:-

Participatory Technology Development (4 yrs)

1. Assessment of status quo in agro-biodiversity potential and efforts conservation (Tumuhairwe etal 2001)

2. Farmer evaluation of existing knowledge and technologies

3. Improvement of innovative farmers' practices

4. Demonstrations by innovative farmers to other farmers

5. Evaluation of developed technologies by relevant stakeholders through field workshops

6. Consultations on policy issues at community, district and national levels. This was done through personal contact and literature reviews.

7. Discussing drafts with decision makers, scientists and farmers' representatives, during a one day technical workshop.

8. Revision of the draft into acceptable (normal) policy document format, reducing the issues to only the most salient ones that can only be handled at policy level.

Results:

a) Policy and Technical Recommendations were described under 9 themes:

1) General issues
2) Current status of agrobiodiversity
3) Public awareness
4) Indigenous knowledge
5) Capacity to conserve
6) Gender issues
7) Technology development, transfer and adoption
8) Institutional issues

a) Our findings was subjected to a SWOT (strengths, weakness, opportunities and threats), through which all important issues were raised recorded by themes.

b) During revision – the major issues were than sorted limiting them to 2 or 3 per theme. The relevant recommendations were listed and only the feasible ones recorded. In some cases, explanations were added for clarity if necessary.

Presentation of one theme as example:-

i) Public Awareness

Main Issues:

- Most people (including government officials) are not aware of the need to conserve agrobiodiversity
- Low ranking of agriculture and environment matters in development plans and budgetary allocations at all levels of decision making (National, Local governments, households)
- Misconceptions – like over emphasis of tree planting in the name of biodiversity conservation

Recommendations:

1. Government should facilitate agrobiodiversity experts to carry out sensitization campaigns to local governments and general public.
2. Local governments should facilitate field practitioners and collaborating farmers to demonstrate good practices that promote agrobiodiversity conservation

Explanation:

Prioritizing items for government expenditures requires the resource persons to be well informed especially of new developmental, environmental and agricultural concerns like agrobiodiversity conservation. Plans made on basis of informed decisions are sure to be implemented and are sustainable.

c) Lessons learnt so far:

1) There is appreciation of PLEC approaches to Agricultural resource management and efforts towards developing policy and technical recommendations for Agrobiodiversity conservation. Government officials, National GEF Programmes, NEMA, Farmers, NGOs, Education Institutes etc. clearly expressed this.
2) Agrobiodiversity is multi-sectoral resource which make it not easy to identify the responsible institution/authority or body to take up the developed policy and technical recommendations.
3) It is difficult to convince people especially policy makers that the work PLEC has done with a few farmers in one Parish, is enough to base policy on. They feel upscaling should be done first before making some conclusions.

References for Joys Policy paper

Tumuhairwe JK ,C. Nkwiine, G. Eilu, G. Gumisiriza and F. Tumuhairwe. (2001)

Agro-biodiversity potential of smallholder farms in a dissected highland plateau of South western Uganda. Paper presented to the EAPLEC regional workshop, Arusha, 26th – 29th Nov. 2001.

UNEP (1990) Land use estimates

Closing Statement/Remarks

Robert Kileo (ZRC-L)

Mr. Chairman,
PLEC Scientific Coordinator,
Representative, Ministry of Agriculture and Food Security,
Meeting Organizers,
Implementing Scientific Staff and Farmers,
Invited guests
Ladies and gentlemen

First of all, on behalf of the Zonal Director, Research and Development in the Lake Zone and on my own behalf, I thank the organizers of this important meeting to give me an opportunity to attend and deliver a closing statement. I find myself honoured.

For the past two days we have heard a series of field experience presentations of various PLEC activities. The most exiting thing to me was a kind of mixed stakeholders involved. We received presentations from Leading Scientists ((PLEC) Collaborating scientists as well as farmers. This is one of many indications that PLEC is participatory in practice. I commend you all for this and argue you to continue with that sprit. It should also be noted that findings from all three East African Countries (Kenya, Tanzania and Uganda) were presented and discussed.

Dear organizers, it is not my aim in this closing statement to go through what was presented in the past three days. However, It was gratifying to hear of a range of activities presented. There was a through coverage of PLEC methodologies, botanical knowledge and its utilization, detailed case studies in all participating countries as well as Socio-economic aspects influencing farmer's decision and utilization of Biodiversity potentials. Other issues included policy and Farmers Indigenous knowledge (IK). To me this was again a clear indication that the PLEC methodology is a holistic approach that most of farmers' circumstances are dealt with simultaneously. Doing so is likely that most farmers' problems can be solved within a short period.

Dear organizers, I find also obliged to comment on what we observed during the field visit. Several technologies are being demonstrated on-farm. We saw farmers working hard to overcome existing environmental challenges by practicing diversity of activities (Crop & Livestock). An appreciation also is to the extent that farmers have a very wide range of uses of available plant species. This is a positive sign and again I congratulate you for that effort. All these efforts to me seem to be an indication that PLEC activities have contributed to farmer's income, food security and environmental conservation. I hope that the few farmers who are now participating will be the catalysts and eventually these technologies will be disseminated to other farmers and places.

Together with these successes, still PLEC faces some challenges. We have heard from case studies that farming communities in Eastern African Highlands faces some threats. These include increase in human populations, land degradation and harsh weather conditions. PLEC should work harder on these by developing suitable technologies to address these challenges.

Dear organizers, I am informed that you are going to have discussions on proposal development for PLEC future. This is an important step. I request you to incorporate deliberations raised up during discussions. I believe that it is possible to include some (eg scaling up, diversified donor funds etc).

Lastly, I am delighted to hear that all expected/invited participants attended this meeting. I thank you all for that and encourage you to keep it up. I am aware that some of the participants came all the way from Uganda, Kenya, Arusha, Tanga and Mwanza.

After this meeting, I wish you a very nice and safe journey back home or to your working places. Thank you for participating into this meeting and listening to me.

After these few statements, and on behalf of the Zonal Director Research and Development, Lake Zone, I formally declare the meeting closed.

Again thank you very much.

LIST OF PARTICIPANTS EAST AFRICA PLEC GENERAL MEETING 26TH - 28TH NOVEMBER, 2001

NAME	COUNTRY
1. Mr. Charles Nkwiine	Uganda
2. Mrs. Joy Tumuhairwe	Uganda
3. Mrs. Jovia Manzi	Uganda
4. Mr. Frank K. Muhwezi	Uganda
5. Mr. Fred Tuhimbisibwe	Uganda
6. J.N.N. Kang'ara	Kenya
7. E.H. Ngoroi	Kenya
8. Kajuju Kaburu	Kenya
9. C.M. Rimui	Kenya
10. Bernard Njeru Reuben Njiru	Kenya
11. Michael Stocking	United Kingdom
12. Fidelis Kaihura	Tanzania
13. Jerry Ngailo	Tanzania
14. Barnabas Kiwambo	Tanzania
15. John Elia	Tanzania
16. Peter Kapingu	Tanzania
17. Essau Mwalukasa	Tanzania
18. Edward Ngatunga	Tanzania

Daily non resident participants

Gidiel Loivoi	Arumeru-Ng'iresi
Frida Kipuyo	Arumeru-Kiserian
Deusdedit Rugangira	Arumeru
Beatrice Maganga	Mwanza
Cypridion Maganga	Mwanza
Edina Kahembe	Arumeru