



Progress Report

March 2000 – August 2000

United Nations University
University of Ghana, Ghana
University of Conakry, Guinea
Kenya Agricultural Research Institute, Kenya
Ukiriguru Agricultural Research Institute, Tanzania
Makerere University, Uganda
Xishuangbanna Tropical Botanical Garden, China
National Research Institute, Papua New Guinea
IPAM (Instituto de Pesquisa Ambiental da Amazônia), Brazil.

Progress Report

SECTION1- BACKGROUND INFORMATION

1.1 *Project Title:* People, Land Management and Environmental Change

1.2 *Project Number:* GF/1300-98-01

1.3 *Responsible Office:* The United Nations University

1.4 *Co-operating/Executing Institutions:* University of Ghana, Ghana; University of Conakry, Guinea; Kenya Agricultural Research Institute, Kenya; Ukiriguru Agricultural Research Institute, Tanzania; Makerere University, Uganda; Xishuangbanna Tropical Botanical Garden, China; National Research Institute, Papua New Guinea; IPAM (Instituto de Pesquisa Ambiental da Amazônia), Brazil.

1.5 *Reporting Period:* 1 March 2000 – 31 August 2000

SECTION 2 –PROJECT STATUS

2.1 *Status of the Implementation of the Activities and Outputs Listed under the Workplan in the Project Document*

2.1.1 *Status of the Implementation (check appropriate box)*

Project activities and outputs listed in the Workplan for the reporting period have been materially completed and the Institution reporting is satisfied that the project will be fully completed on time (given reasons for minor variations at Section 3 below)

Project activities and outputs listed in the Workplan for the reporting period have been altered (give reasons for alterations: lack of finance; lack of guideline; reformulated; project revisions; other at Section 3 below)

Project activities and outputs listed in the Workplan for the reporting period have not been fully completed and delays in project delivery are expected (give reasons for variations in Section 3.1 and new completion date in Section 3.2 below)

Insufficient detail provided in the Project Workplan

2.1.2 *Overall Progress Against the Project Workplan*

PLEC is now more than halfway through the present four-year phase under GEF support. The project began its third year of implementation on 1 March 2000, and its progress is on schedule. Much of the progress made from March to August 2000 centered on the gathering and analysis of biodiversity and agrodiversity data collected in the initial stage, as well as on identification and demonstration of profitable and biodiversity-rich management systems, and on networking and capacity building. Some technical and policy recommendations are emerging in line with project objectives.

Using PLEC guidelines for assessment of biodiversity and agrodiversity, most of the necessary baseline data has been collected although gap filling and monitoring of changes in biodiversity and agrodiversity continue. Major efforts have been made to assemble these data into a database form at the national level, and to advance data analysis and synthesis. To facilitate and harmonize database work across countries, PLEC database guidelines were developed and provided to cluster personnel and put online. The database structure is being further refined to include information on not only biodiversity but also agrodiversity. Several clusters have established working databases. An aggregated database summarized from cluster databases will be online by the end of this year.

Preliminary data analysis and synthesis offers some technical and policy recommendations. Many cases show that agriculture, or other forms of management of natural resources, does not necessarily reduce biodiversity. On the contrary, it may enhance biodiversity and improve land quality. As part of a strategy to increase their incomes in the face of falling agricultural prices, farmers in the Amazon floodplain near Macapa, Brazil, are protecting the seedlings of timber species to enrich their future fallows and forests. Farmers have developed intricate sets of techniques using a diversity of crops and cropping systems important to conservation as well as to local food security at demonstration sites near Arumeru, Tanzania. The household-level assessment in Yunnan, China is helping to track, measure and analyze the fascinating process of household diversification following the break up of communes into individual holdings under the 'household contract responsibility system' in early 1980s.

To further analyze available information, and in response to the mid-term review, a PLEC-wide email forum was organized to identify priority issues and appropriate approaches with a focus on revealing relationships between biodiversity and agrodiversity (management and organizational diversity). The Biodiversity Advisory Group (BAG) and the Demonstration Activities Advisory Team (DAT) are now combined as the Scientific and Technical Advisory Team (STAT) to streamline efforts for consolidation of PLEC results. The emphasized efforts of consolidation through data analysis are also helping improvement and completion of all pending chapter-length reports.

Demonstration activities as well as experimental work has now become the dominant field activity at 21 established demonstration sites in eight countries. Further demonstration sites are in development, some of which have been added in response to popular demand from nearby communities. Harmonization of demonstration approaches has basically been accomplished with DAT (now STAT) advice. All clusters have now adjusted their approaches to demonstration to farmer-led capacity building while identification and documentation of good practices and expert farmers continues. The PLEC approach continued to generate enthusiasm among farmers, extensionists, even schoolteachers and children. Demonstration is promoting practices that combine well conservation with farmers' livelihoods. A preliminary report of demonstration activities will be completed by Feb 2001.

Capacity building activities are making an impact on PLEC scientific participants themselves. Most now embrace a farmer-centred approach, and are learning computer, language and other research skills. Students and junior researchers continued to receive training 'on the

job' in the PLEC approach to rural development with conservation. Some of them have done their degree theses based on PLEC work. PLEC concepts and approaches are incorporated into university curriculum. A final report on capacity building will be prepared by Feb 2001.

The scope of PLEC capacity building goes beyond academic training. Demonstration of biodiverse and successful resource management involves farmer-to-farmer training. Training courses on practical techniques and knowledge were also provided. Increased involvement of schoolteachers and children in PLEC demonstration helps to spread and sustain PLEC concepts, especially appreciation of local knowledge among new generation. Having participated in demonstration activities, the school children in Arumeru, Tanzania were newly appreciative of their parents' expertise in agricultural production, something they did not believe in before.

Networking continued to be strengthened. A major project-wide event was organized to foster international exchange across clusters:

The 3rd General Meeting, the 4th Meeting of the Management Group, and the Coordination Team Meeting were held back to back in Belem and Macapa, Brazil, from 26 May to 2 June. The main purpose of the General Meeting was to present progress, share experiences and lessons among all Clusters, as well as to look forward. Participants of the meetings also considered the mid-term review, and began a debate on alternative forms for PLEC sustainability beyond the present GEF phase.

Networking within countries was also advanced to link PLEC with national government agencies and relevant initiatives, and to strengthen collaboration and exchange between demonstration sites. PLEC-Tanzania is developing effective approaches to involve policy makers at the highest levels. Regional meetings and visits between demonstration sites in different regions in Ghana and Brazil offered an opportunity for farmers and extensionists to observe each other's work and exchange experiences, seeds and plants. These activities are contributing to the gradual development of local management systems that draw on regional and not just local agrodiversity.

Policy recommendations and dissemination continued through publications, conference and media. The project periodical- "PLEC News and Views" continued to offer a quick channel to disseminate PLEC results. Two issues, No. 15 and No. 16 were published, in June, and September 2000, respectively. "PLEC News and Views" and several PLEC documents are now online at <http://www.unu.edu/env/plec/>.

The proposal for a PLEC manual book "Understanding, Analysing and Using Agrodiversity" was prepared to discuss with a publisher in October. It will be one of PLEC principal outputs. Funded by other UNEP funds, a working paper titled *Land Degradation - Guidelines for Field Assessment* has been completed and put online. It will be helpful to many PLEC participants. PLEC was well received at the 15th Session of Global Biodiversity Forum, 12-14 May 2000 and at a special session during COP5/CBD, 19 May 2000.

The mid-term review of PLEC was facilitated to conduct in the month of April 2000. The review report praises the project for having made important progress on the theme of “agricultural diversity” in only two GEF-funded years. It calls for more efforts to consolidate PLEC results and to move into a more analytical stage.

2.2 List Actual Project Personnel/Consultants engaged and Non-Expendable Equipment Purchased:

See Appendix 1 for List of Project Personnel/Consultants.

See Appendix 2 for List of Non-Expendable Equipment.

2.3 List Actual Activities and Outputs Achieved in the Reporting Period

2.3.1 FIELD-BASED ACTIVITIES: DEMONSTRATION SITES, BIODIVERSITY ASSESSMENT, PARTICIPATORY RURAL APPRAISAL and OUTREACH AND EXPERIMENTAL WORK

With completion of much of the fieldwork on assessment of basic existing agrodiversity and biodiversity, demonstration activities as well as experimental work has become the dominant field activity at 21 established demonstration sites in eight countries. Further demonstration sites are in development, some of which have been added in response to popular demand from nearby communities.

Potential areas for PLEC replication are being identified. Farmers from potential areas of neighbouring villages are applying to join PLEC in Tanzania. A meeting of local authorities, farmers and researchers was organized specifically to identify these potential areas in Guinea. Specific locations of demonstrations and other PLEC activities as well as potential demonstration sites were mapped in southern Ghana. A secondary site was identified in Brazil.

Using PLEC guidelines for assessment of biodiversity and agrodiversity, most of the necessary baseline data has been collected although gap filling and monitoring of changes in biodiversity and agrodiversity continue. Major efforts have been made to assemble these data into a database form at the national level, and to advance data analysis and synthesis. To facilitate and harmonize database work across countries, PLEC database guidelines (database structure in MS Access program, and an operational manual, and a sample database) were developed and provided to cluster personnel. These guidelines are also available from the PLEC homepage. Database training lectures were given to PLEC team members in China, and Thailand. The database guidelines are being further refined to include information on not only biodiversity but also agrodiversity. The database will also be used for analysis. Several clusters have established working databases. An aggregated database summarized from cluster databases will be online by the end of this year.

Preliminary data analysis and synthesis offers some technical and policy recommendations. Many cases show that agriculture, or other forms of management of natural resources, does not necessarily reduce biodiversity. On the contrary, it may enhance biodiversity and improve land quality. As part of a strategy to increase their incomes in the face of falling agricultural prices, farmers in the Amazon floodplain near Macapa, Brazil, are protecting the seedlings of timber species to enrich their future fallows and forests. Farmers have developed intricate sets of techniques using a diversity of crops and cropping systems important to conservation as well as to local food security at demonstration sites near Arumeru, Tanzania. The household-level assessment in Yunnan, China is helping to track, measure and analyze the fascinating process of household diversification following the break up of communes into individual holdings under the 'household contract responsibility system' in early 1980s. Bananas were distinguished into clones, and many utility values of banana were identified in Uganda.

To further analyze available information, and in response to the mid-term review, a PLEC-wide email forum was organized to identify priority issues and appropriate approaches with a focus on revealing relationships between biodiversity and agrodiversity (management and organizational diversity). The Biodiversity Advisory Group (BAG) and the Demonstration Activities Advisory Team (DAT) are now combined as the Scientific and Technical Advisory Team (STAT) to streamline efforts to consolidate PLEC results. The data analysis is helping to improve and complete pending chapter-length reports.

Harmonization of demonstration approaches has basically accomplished with DAT (now STAT) advice. All clusters have now adjusted their approaches to demonstration to farmer-led capacity building while identification and documentation of good practices and expert farmers continues. The PLEC approach continued to generate enthusiasm and confidence on demonstration activities from farmers, extensionists, even schoolteachers and children. Farmers who participate in PLEC activities as trainers have gained a greater degree of self-confidence; PLEC scientists in Uganda have established this through longer and more frequent interaction and encouragement. Such training has greatly accelerated farmer-led demonstrations of best practices there.

Demonstration is promoting practices that combine conservation with farmers' livelihoods. Expansion and success of the PLEC gardener group in food production using compost attracted support in the form of 15 tons of rice from the World Food Program in Guinea. Group and individually owned plant nurseries are gradually developed into commercial ventures in Ghana.

Experiences and knowledge learned and built through demonstration activities will continue to be analysed. When appropriate particular production or management techniques and systems that maintain or produce high levels of biodiversity will be recommended to public and private development and conservation agencies. A preliminary report will be produced by Feb 2001.

Using other UNEP funds, a working paper entitled *Land Degradation - Guidelines for Field Assessment* has been placed online. It is sure to be useful to many PLEC participants,

and will have wide application beyond PLEC. The working paper includes some outputs from an initiative with PLEC clusters in Asia-Pacific Region for land degradation assessment under joint support between PLEC and the Macquarie University in Australia. A final report of the initiative is expected by early 2001.

2.3.2 ACTIVITY 5: REPORTS, WORKSHOPS ON MODELS

A few more principal reports were completed by clusters and sub clusters. Gap filling continued to consolidate, improve and complete pending chapter-length reports at national and cluster levels. Some of them were selected to put into recent issues of “PLEC News and Views”. Considerable efforts have also been made to ensure completion of chapter-length reports by Feb 2001, notably in Ghana. Project-wide consolidation of cluster reports continued. Some of those reports are being compiled into the planned PLEC manual book “Understanding, Analysing and Using Agrodiversity”.

Practical instructions on database construction were provided to cluster personnel through email distribution of guidelines, technical advice, and training lectures. While some clusters have set up working databases, compilation and updating of biodiversity and agrodiversity data continued. An aggregated database summarized from cluster databases will be online by the end of this year.

2.2.6 ACTIVITY 6: CAPACITY STRENGTHENING (TRAINING)

Capacity building activities are making an impact on PLEC scientists themselves. Most now embrace a farmer-centred approach, and are learning computer, language and other research skills. A new PLEC team at University of Kankan was trained to take over fieldwork at the Kouroussa site in Guinea. Students and junior researchers continued to receive training ‘on the job’ in the PLEC approach to rural development with conservation. Some of them have done their degree theses based on PLEC activities. A training course on PLEC methodology was conducted in Yunnan, China, 20-26 July 2000. With a the financial aid of a UNU fellowship, a PLEC researcher completed his one-year study in University of East Anglia and returned to resume his role with PLEC-China.

In addition, PLEC concepts and approaches are incorporated into a newly established undergraduate degree programme at Makerere University, Uganda. The draft of a course that draws on the PLEC approach to resource conservation is nearing completion for approval within the 2000/2001 academic year and possible introduction within 2001/2002 in the University of Ghana. These efforts on curriculum development will greatly increase number of university students and young researchers appreciating and applying PLEC methodologies.

The scope of PLEC capacity building goes beyond academic training. Demonstration of biodiverse and successful resource management involves farmer-to-farmer training. A course in the preparation of medicines using local plants has enabled a women's club in a PLEC community to sell medicines not only in the community but also to other communities in Brazil. Training courses on practical techniques and knowledge were also provided. Literacy classes continued to enhance women's ability in developing local enterprises in a village near Pita, Guinea. Farmers were trained in technical designing and construction of maize drying crib, and one of farmers has applied to PLEC for further training and certification of him as an artisan to help the community adopt this technology as timely and adequate drying of post-harvest farm produce and storage of planting materials is a common problem in the demonstration site in Uganda.

Increased involvement of schoolteachers and children in PLEC demonstration helps to spread and sustain PLEC concepts, especially appreciation of local knowledge among young generation. Having participated in demonstration activities, the school children in Arumeru, Tanzania were newly appreciative of their parents' expertise in agricultural production, something they did not believe in before. A school children's chapter of PLEC within the primary & junior secondary school at Adenya in southern Ghana was inaugurated in June 2000. The continuing PLEC environmental education courses for school teachers and community leaders are proving to be an effective way to generate discussion within and between communities on local environmental issues and are serving as a starting point for developing community projects to address local agricultural and resource management issues near Santarém, Brazil.

2.2.7 ACTIVITY 7: NETWORKING AND DISSEMINATION

Networking continued to be strengthened. A major project-wide event was organized to foster international exchange across clusters:

The 3^d General Meeting, the 4th Meeting of the Management Group, and the Coordination Team Meeting were held back to back in Belem and Macapa, Brazil, from 26 May to 2 June. The main purpose of the General Meeting was to present progress, share experiences and lessons among all Clusters, as well as to look forward. Participants of the meetings also considered the mid-term review, and began a debate on alternative forms for PLEC sustainability beyond the present GEF phase. The meeting included in-house sessions and field visits. Three special sessions were featured: on biodiversity assessment and database construction, on demonstration activities, and on the future of PLEC. A group of PLEC expert farmers from demonstration sites in Macapa also gave presentations on how they manage and conserve biodiversity in their farms and communities. The meeting was attended by 32 formal participants from all PLEC Clusters around the world, the UNU, and UNEP, as well as a number of additional participants including farmers, field assistants, and researchers. Reply and follow-up to the mid-term review was one of major topics at both the 4th Meeting of Management Group and the Coordination Team Meeting.

Networking within countries was also advanced to link PLEC with national government agencies and relevant initiatives, and to strengthen collaboration and exchange between demonstration sites. PLEC-Tanzania is developing effective approaches to involve policy

makers at the highest levels. The national institutions in Uganda now refer people inquiring about agrodiversity and agrobiodiversity to PLEC-Uganda. Regional meetings and visits between demonstration sites in different regions in Ghana and Brazil offered an opportunity for farmers and extensionists to observe each other's work and exchange experiences, seeds and plants. These activities are contributing to the gradual development of local management systems that draw on regional and not just local agrodiversity.

Policy recommendations and dissemination continued through publication, conference and media. The project periodical-“PLEC News and Views” continued to offer a quick channel to disseminate PLEC results to its project members as well as to the general public, including policy makers. Two issues, No. 15 and No. 16 were published, in June, and September 2000, respectively. “PLEC News and Views” and several PLEC documents are online at the PLEC home page <http://www.unu.edu/env/plec/>.

The proposal for a PLEC manual book “Understanding, Analysing and Using Agrodiversity” was prepared to discuss with a publisher in October. Funded by other UNEP funds, a working paper titled *Land Degradation - Guidelines for Field Assessment* has been completed and put online. It will be helpful to many PLEC participants. A paper “Agrodiversity as a means of sustaining small scale dryland farming systems in Tanzania” was well received at the 15th Session of Global Biodiversity Forum, 12-14 May 2000. Two members of PLEC-Uganda participated in part of the COP5/CBD meetings and presented a paper on “Agricultural Biodiversity Potential in East Africa: Global Significance, Prospects and Threats” at the special session on GEF projects in east Africa, 19 May. Several articles by Amazonia Cluster are in the review process or in press.

Newspaper, television and radio reported PLEC in Uganda, Guinea and China.

Details of meetings, publications and conference presentation are included in Appendix 3.

2.2.8 ACTIVITY 8: COORDINATION AND PLANNING

Project implementation is monitored internally by UNU, and externally by UNEP. PLEC coordination facilitated the review done by an external reviewer appointed by UNEP. The reviewer conducted the mid-term review of PLEC in the month of April 2000. Relevant reports and publications on PLEC were provided to the reviewer, who visited UNU and three PLEC Clusters (China, Ghana, Brazil). The review report praises the project for having made important progress on the theme of “agricultural diversity” in only two GEF-funded years. It also praises the “lean central administration” at UNU and the effective management unit at the cross-country level. It calls for more efforts to consolidate PLEC results and to move into a more analytical stage. A project-wide email forum on potential ways of sustaining PLEC activities after the present phase has been organized and will continue.

Coordinators met in Belem after the Management Group meeting. It was proposed that a medium-sized project be developed to take advantage of emerging directions and special opportunities; this idea was also noted in the mid-term review. As Dr. Kiome, the former leader of East Africa Cluster, has assumed much more responsibility within his organization in Kenya, and has less time for coordination within East Africa, it was decided that Dr. Kiome be appointed Regional Advisor for East Africa and Leader for Kenya sub-cluster within PLEC. Group leaders within Kenya will also take on more responsibilities.

Coordination with and within clusters continued. China Cluster is now hosted by the Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences, due to relocation of personnel.

2.3 Targets for the Next year

Overall targets for the next period of work in relation to the annual work plan and outcomes of the previous period of work are described under each activity.

Activity 1: Demonstration Site

Using field and GIS methods as appropriate, commence investigation of potential sites in which PLEC methodology might be replicated. Include preliminary discussion in Report 7.

Activity 2: Biodiversity Assessment

By 1 December 2000, every cluster and subcluster should be able to prepare data summaries and basic analysis (percentiles and categories) in database format. These summaries can then contribute to the database available on the Web.

Using both verbal and cartographic means as appropriate, a report showing how community evaluation of resources relates to their scientific evaluation will be prepared and results will be reported under Activity 5 below (Report 6).

Activity 3: Participatory Rural Appraisal

Using both verbal and cartographic means as appropriate, a report showing how the system of resource access and distribution relates to the use of land, in the selected areas will be prepared and results reported under Activity 5 below (Report 6).

Activity 4: Outreach and Experimental Work

With farmers' associations and individual farmers, experimental and demonstration activities will be continued and enlarged; preliminary results will be evaluated (REPORT 7).

Community-level workshops to review results will be held, and changes in method and coverage proposed.

Activity 5: Reports, Workshops on Models

Two chapter-length reports on (1) the relation of community information to scientific information on resource assessment, and on how the system of resource access and distribution relates to the use of land will be completed (Report 6); (2) preliminary results from experimental and monitoring work at the demonstration sites, with a note on sites where PLEC might be expanded or replicated (Report 7).

Activity 6: Capacity Strengthening (Training)

Training for junior participants and students will be continued, ensuring that all participants in the project, especially new participants, are thoroughly familiar with the PLEC approach and the manner in which it differs from standard extension methods.

Expert farmers will be assisted in encouraging other farmers to use successful methods.

A summary of progress in the capacity building programme, with quantitative data on number, status and gender of persons trained will be prepared.

Activity 7: Networking and dissemination

Networking and involving stakeholders in PLEC activities at international, national and local levels will continue.

The 2nd Meeting of PLEC Advisory Group will be held on, 3 November 2000 Rome. An end of year general Cluster meeting will be organized and venues to network government agencies, national institutions will be explored.

PLEC will continue to disseminate results widely through presentations, media (newspaper, TV, radio, etc.), and publication of *PLEC News and Views* No. 17, and papers for the planned PLEC book "Understanding, Analysing and Using Agrodiversity" will be prepared and compiled. PLEC will be presented at 11th International Soil Conservation Conference, Buenos Aires, 22-27 October 2000.

Activity 8: Coordination and planning

Part of the coordination team will meet in Rome after the second Advisory Group meeting early November to discuss emerging issues.

Cluster meetings will be organised to review progress and plan forward.

SECTION 3 – PROJECT DELIVERY AND ACTION

3.1 Summary of the Problems Encountered in Project Delivery (if any)

There generally was inadequate consolidation and integration of available information in country for principal reports and database although basic data and information have been collected at initial stage. This problem is also highlighted by the mid-term reviewer.

Delays in reporting of cluster progress have become an issue although most cluster activities continue on schedule. Financial reports from Kenya, China and Papua New Guinea for last year's contract were seriously delayed. Again, a number of clusters including Kenya, China, Papua New Guinea and Ghana have delayed their progress and financial reports for the period of March to August 2000. Due to promotion in their institutions, cluster leaders in both China and Kenya have assumed more responsibilities for other activities and have less time for PLEC activities. In Ghana, PLEC work has also expanded far beyond original expectation; it now is difficult to manage without additional staff time and personnel.

3.2 Actions taken or required to solve the Problems (identified in Section 3.1 above)

In order to facilitate consolidation of available information, a project-wide email forum was organised to identify priority issues and tools important to data analysis. Practical guidelines for database compilation were also developed. More guidance for principal reports will be provided to clusters in the near future.

It was recommended that cluster leaders delegate more responsibilities to other fellow members so that they can concentrate their increasingly limited time to ensure timely submission of all required reports. More staff time and personnel are also required for expanding PLEC work.

As PLEC is under institutional contracts, host institutions of clusters should also take more responsibilities of administrative and financial management of PLEC, freeing cluster leaders to supervise planning, implementation and reporting of PLEC project activities.

An inquiry will be made to identify causes of reporting delays and to propose further actions.

SECTION 4- SUMMARY OF CLUSTER PROGRESS

FIELD-BASED ACTIVITIES 1 TO 4: DEMONSTRATION SITES, BIODIVERSITY ASSESSMENT, PARTICIPATORY RURAL APPRAISAL and OUTREACH AND EXPERIMENTAL WORK

Amazonia

Santarém:

Work continued at two main sites on both sides of Ituqui island: Aracampina on the northern side and Santíssimo on the southern side. A secondary site was identified on São Miguel Island.

A number of assessments continued. The study of smallholder house gardens on Ituqui found that while a fairly large number of species were cultivated by farmers, only a few (20) occurred in most house gardens and an even smaller number appear to have been cultivated in commercially significant numbers by Ituqui farmers. The largest number of species consists of ornamentals followed by medicinal species

and fruit trees. One of the main preoccupations of farmers is with plant survival during the flood season. Three species, ingá (a legume), cashew and guava were cited as particularly resistant. Some varieties of bananas are fairly resistant. Farmers offered a number of techniques for reducing flood related mortality. Preliminary results from another ongoing study of the ecological impacts of cattle and water buffalo indicate that water buffalo and cattle have a significant impact on the regenerative capacity of floodplain forests. Species diversity often tends to be highest in areas of medium disturbance of buffalo and cattle, and lowest in areas of high disturbance. Lastly, PLEC is working with farmers at secondary site of São Miguel to evaluate the present situation of agricultural and ecological decline, and develop strategies for reversing the trend.

As part of the social analysis, a household socio-economic study was conducted as part of the survey of perennial crops cultivated by Ituqui farmers. Another study of the smallholder household economy in Ituqui and the Tapará regions is underway to focus on smallholder's management strategies with different combinations of farming, fishing and cattle raising in managed and unmanaged lake systems.

Experimental and outreach activities continued. Grupo Renascer of Aracampina is monitoring seedling development of trees planted in previous reforestation efforts, and has started a new project involving planting of canarana and reforestation along adjacent lake margins. The group submitted a proposal to the G-7 Pilot Program for the Conservation of Brazilian Forests for continued support. Grupo Intercomunitário for the restoration of habitats of Ituqui did not attract wider participation because of the intercommunity nature of the participants and the fact that the site was located in only one of the four participating communities. A group of farmers have been formed on Ilha de São Miguel to plant fruit trees to diversify household production systems. Two range management projects are now underway involving planting canarana. Planting was done early this year and growth monitored through the flood season. Canarana is also used to stabilize riverbanks. As part of Community Seed bank efforts, farmers in each community have structured their seed banks, defining rules and responsibilities.

Macapá:

Work continued at the Mazagão and Ipixuna sites. Among new efforts is a project involving five families' participation in an effort to supplement family income with shrimp caught in nearby river channels. Families are working with traditional shrimp traps and are monitoring catch and effort on a monthly basis over the course of the year to assess the potential of this activity for supplementing household income.

Marajó:

Work continued at the Jabuti and Retiro Grande communities, in the municipality of Cachoeira do Arari in central Marajó Island. Monitoring cultivation practices and inventorying species continued. In both communities cattle raising is an important activity, however, it is constrained by the limited area available for grazing and the low value of dairy products.

Yunnan, China

Work continued at demonstration sites in Baoshan and Xishuangbanna. The process of identifying and selecting expert farmers has been concluded and demonstration plots have been established in the landholdings of the selected farmers. The recent STAT visit provided advice to cluster personnel on how to initiate demonstration activities according to the PLEC principle of "farmers teaching farmers". Future demonstration activities should be focused on facilitating interaction among farmers. Selected students and technicians can play an important role in facilitating and documenting such interactions during demonstration activities. During the meetings it was mentioned that farmers at both sites use several ways to learn. These traditional ways of interaction and learning from each other by farmers can be the basis for selecting, planning, executing and monitoring demonstration activities.

While there is a lot of agrodiversity as well as richness in management practices that can be exchanged between farmers and the selected experts, demonstration activities are focused on the following production and management systems and techniques:

1) Diversification of crop/variety production in rice paddies; 2) Enriching house gardens and fallows with forest species; 3) The benefits of planting more than one species in a reforestation program; 4) Upland planting and agroforestry systems; 5) Irrigated farming.

Papua New Guinea

Work continued at Tumam/Nghambole Demonstration Site, Dreikikir-Wosera in East Sepik Province and the newly confirmed demonstration site at Ogotana village on the Sogeri plateau, Central Province. The Tari site was dropped.

Tumam/Nghambole Demonstration Site:

- Agrodiversity assessment for second year garden (Yekene) – 50 gardens (30 Tumam and 20 Nghambole)
- Hunting survey (3 hunters)
- Dietary survey (16 families – 8 from Tumam and 8 from Nghambole)
- Market survey (6 families – 3 from Tumam and 3 from Nghambole)
- Monitoring of management practices of 12 farmers

Ogotana Demonstration Site:

The following activities have been accomplished during the reporting period:

- Partial analysis of biodiversity assessment for selected land use stages (fallow types).
- Establishment of nursery and bulking of biodiverse seedlings for the rehabilitation demonstration
- Establishment of grassland rehabilitation plot for demonstration work:

The grassland invasion may reduce natural biodiversity but Ogotana farmers have benefited from the gardening transformation process. Snails are a major pest of food crops in Ogotana. These snails are prolific in forest gardens due to moist conditions but the hot grassland environment reduces snail population. Farmers have been cultivating grassland areas for certain food crops including sweet potato and yams that they claimed produce reasonable yields.

There are long-term implications associated with rehabilitating grassland areas. The rehabilitation process would create a conducive environment which would favour snail population. The challenge is for research to strike a balance between reducing grassland areas (in particular, *Imperata* invasion) by rehabilitation, and controlling snail population.

Uganda

1. Field work concentrated at the main site in Bushwere Parish in Mwizi Sub-county.
2. Biodiversity assessment: agrobiodiversity monitoring plots were remarked using a multipurpose plant (*Solanum* sp.) agreed upon with collaborating farmers. Agrodiversity and biodiversity monitoring was repeated for the second season (Ekyanda) in agricultural fields, distinguishing bananas into clones and noting their different uses and characteristics. Household approach was initiated to assess homegardens and gardens at various distances from homestead, and two households representing two of five strata were completed. The approach will test a hypothesis “more deliberate biodiversity conservation in gardens closer to homesteads than further away”.
3. PRA was carried out on gender roles in farming and agrobiodiversity conservation and on fruit growing potential and diversity. Five households and their farms were mapped. Assessment of resource access and distribution, and monitoring of farm record keeping are going on.
4. Farmer demonstrations were developed and facilitated on: 1) drip irrigation for tree seedlings; 2) conservation of multiple species; i.e. fruits, vegetables, tubers, sugarcane, fodder and medicinal in banana plantation and the benefits of integrating stall feeding livestock to banana cultivation; 3)

storage and preparation of planting materials for efficiency in timing of planting annual crops; 4) use of different species of trees, shrubs, grasses and banana fibres for different types of post harvest storage; 5) increase of high value fodder species in fields and around homesteads to beat the prevalent shortage of livestock fodder; 6) exhibition of the “Agrodiversity and Biodiversity potential” to district and local officials, other farmers in the parish and other stakeholders (both in stalls and in field).

5. Experiments were conducted or initiated on using biodiversity (a wooden structure and/or flowers of a plant species known to release acetylene gas) to regulate germination of Irish planting materials; on the various locally known utility values of banana pseudostems, fibres, flowers etc and several agroforestry and forestry species; and on management of grass strips in banana gardens and on fruit tree growing, with volunteers among collaborating farmers.

6. Two women’s group, one youth farmers’ group and two others were facilitated on income earning activities including tree nurseries, coffee nurseries and fruit tree growing. Collaboration with nine existing farmer/community groups, and one new one was initiated and planned to incorporate PLEC objectives in their activities.

7. Interaction with farmers on a more regular basis and longer periods than before has boosted the farmer’s self-confidence thus exposing their potential as innovators, demonstrators, adopters and managers of their resources.

Kenya

Work continued at sites in Kiambu, and in Embu. Biodiversity assessment in Kiambu site was completed and reported. An interesting finding is that species richness is the higher in cultivated private lands than in natural forest.

Tanzania

Work continues at both Kiserian and Olgilai/Ngiresi sites. A field day was conducted in Kiserian by the expert farmer on conservation of woodlots. Farmers from all sub-villages in Kiserian and the village government representatives attended the field day. A new farmer group was formed in Olgilai/Ngiresi site and requested PLEC to advise them on land resources management. Individual outstanding expert farmers were supplied with fencing materials and purchase of beehives. Remaining PLEC farmer’s plots were digitised including their boundaries in constituent sub-villages for boundary demarcation in the existing map. The success of water harvesting and fertility improvement experiments in Kiserian plus good experiences of on site demonstrations and discussions by participating farmers has led farmers from neighbouring villages to request PLEC involvement in their villages. They have been asked to formally apply and indicate reasons for their interest to join PLEC.

Gaps in biodiversity assessment were filled. The analysis has also been done, and the report is being compiled. Agrodiversity assessment continued at farm level for selected farmers. A comprehensive database programme has been developed using PLEC database manual and example but does not limit itself to plant species data but also other collected data and provides for opportunities to compare them. Data are being transferred from previously used Excel spreadsheet to the developed software. All sampled fields and quadrates were re-marked and all points previously not digitised now completed. Monitoring will follow when it is most appropriate.

PRAs were conducted to assess differences in resources management by different farmer categories, sources of income, labour and other organisational aspects as outlined in PLEC agrodiversity assessment guidelines. Group discussions were also held in both sites to cover aspects of land tenure and water use. Farmer-filled data forms on income and expenditure were analysed for the period June 1999 to June 2000. A report on both aspects is under compilation.

Seven on-farm demonstrations were carried out by expert farmers with an average of 30 farmers attended each time in PLEC sites, which were mainly organised by extension staff. Three demonstrations in Kiserian covered traditional soil conservation measures, on propagation of seeds for production of tree seedlings and conservation of individual and communal woodlots, and on conservation and management of pastures. In Olgilai/Ngiresi site four demonstrations covered production of vegetables,

improved maize production, pasture production and conservation tillage. Farmers from outside PLEC sites also attended. In two cases school children and their teachers in agriculture were invited to attend. Those children were amazed on how much their parents knew about agricultural production, something they did not believe in before. They requested to participate in the next coming farmer training demonstrations. Videotapes were taken and plans are underway to show these to respective farmers.

Experimentation on water harvesting and soil fertility improvement in Kiserian is being done now, and others on-going. Results will be reported in the next half-year. Individually initiated experiments are being closely and continuously monitored. Further discussions and meetings/workshops are planned for development of initial technical and policy recommendations.

Ghana

Work consolidated and expanded especially in use of identified 'model' biodiverse farms and adjoining conserved forests for demonstrations through 'expert farmers'. The expansion was particularly pronounced in southern and central Ghana. PLEC continued materials and technical support to PLEC Farmers' Associations. Based on GIS and other field techniques and methods, specific locations of demonstrations and other PLEC activities as well as potential demonstration sites were mapped in southern Ghana. Cartographic plotting is in progress.

Gaps in biodiversity data continued to be filled. However because of time and logistical constraint, in the future it might be necessary to limit the field assessment to one demonstration site in the case of southern Ghana. In northern Ghana, there was a felt need for technical support by southern Ghana or by some other external person or body. Agrodiversity assessment in southern Ghana outputs is expected to be enriched by greater participant observation and a modified questionnaire. Completed reports on assessment would be expected by end of February 2000. Updated information on evaluation of resources by communities relative to evaluation by scientists in southern Ghana was sought through a detailed questionnaire, and will be combined with previous studies for analysis by end of February 2000.

PRA work focussed on completion of data generation for social analysis of demonstration site population with special reference to gender and other demographic characteristics and how these relate to resource tenure and management. On the whole, substantial information on resource access relative to land use was gathered. With information generated through previous studies, there should be sufficient empirical data for analysis of appropriate hypotheses on relationship between resource access and resource management.

Many demonstration activities for creating value out of biodiversity include bee keeping, snail rearing local poultry raising, and mushroom farming in conserved forests and plant nurseries; commercial breeding of seedlings in nurseries; integrated development of piggery and dry season vegetable gardening; and, processing of cassava into flour for bread and pastries. Group and individually owned plant nurseries are gradually developed into commercial ventures. Activities were promoted to conserve trees, *in situ*, alongside crops in farms, forests adjoining farms, rice and yams, medicinal plants in arboreta in many sites. Plant nurseries on both group and private individual basis in all sites, and woodlots in a number of sites were developed. Watershed management and waterfall protection through buffer zones were also initiated in a few sites. A windbreak of trees to protect crops and roofs of houses was created in Sekesua-Osonson site. Research was consolidated on soil conservation including anti-soil erosion stone lining and indigenous agroforestry systems, with a focus on trees that combine (or conversely do not combine) effectively with field crops.

Guinea

Work focused on two existing demonstration sites in Pita (Bantignel) and in Kouroussa (Moussaya), with some extension to other small villages nearby. A meeting between local authorities, farmers and researchers took place in Pita to identify potential replication of some activities in other villages where sustainable infrastructure and operational groups exist. The textile dyers of Gaggal village asked to join PLEC activities. The villagers of Hindé, Horoya and Hoore Koolè needed help from PLEC expert farmers

for cowshed construction. Many villagers requested training to learn techniques of composting and nursery management.

Pita site:

Specialized farmers' groups in gardening, composting, reforestation, dyeing and soap making have organized many productive activities in both dry and rainy seasons. Dyeing and soap making involve sustainable use of many local plant species (e.g. *Lonchocarpus cyanescens*, *indigofera tinctoria*, *morinda gemminata* for dying; *jatropha curcas*, *carapa procera* for soap). As a result, farmers have work to do the whole year. Those jobless people originating from Missidé Héiré now ask to return and participate in those activities. More and more people are joining PLEC farmer groups. Women in Pita also participate in a variety of work, such as soil preparation, sowing, harvesting, processing and transportation. Most male labourers have gone to big cities, leaving women, children and old people in villages. Therefore, women are the major force in PLEC farmers' groups.

The gardening group concentrated its efforts on cultivation of potatoes, ground nuts, fonio (also acha in Nigeria = *Digitaria exilis*), and niebé (or niebe with two acute accents on the 'e's, is one of the terms for cowpea, until recently *Vigna unguiculata* now often *Vigna sinensis*). A good harvest of potato was due to improvement of soil fertility by the compost with cow manure. Mineral fertilizer was also applied. Land can be now utilised the whole year by crop rotation. The first crop was potato, followed by sweet potato and niebé. The potato yield of one plot was poor due to high water table and rain. Planting calendar will be adjusted to avoid this problem. The World Food Program (WFP) awarded 15 tons of rice to PLEC groups in recognition of their organized efforts for food security. Local actors are now more aware of PLEC activities.

The expert farmers are active in popularising composting techniques in PLEC villages and nearby settlements. The two existing manure cowsheds produced good quality compost for different groups to fertilize their plots in fenced and unfenced fields.

Sustainable management is now widely understood and accepted. The nursery in one village provided seedlings of many very useful local and introduced or endangered species to other villages for reforestation and agroforestry in degraded areas, water sources, along fences and other suitable areas. Expert farmers developed reliable agroforestry systems to control bush fire. Many areas have been reforested using these systems. The reforestation is encouraged by USAID. Missidé Héiré villagers stop using dry wood for fencing. Instead, they are using acacia live trees and iron wire for fencing. Productive and mixed cropping systems were also promoted.

Dyeing is both a profitable activity and art, involving 30% of Fouta Djallon women. The PLEC dyer women's group has 22 women. With an increase in production the group has 4 representatives residing in Conakry for marketing. The reorganization of the group into three sub-groups permits work division and non-stop production during the year. Women from other villages have also participated. The cotton cultivation was increased to reduce dependence on external supplies of raw material.

The soap making which used to be done on a small scale has now expanded to other villages. More women are involved in the activity. The income they derive from this activity is encouraging.

The database is being set up according to the recommended PLEC model. Demographic data on age, sex and proportion of working people were collected. Rural-urban migration and gender in farming activities were also investigated.

Kouroussa (Moussaya) site:

The fieldwork was entirely supported by a newly established PLEC team at Kankan University. Farmers, craftsman and fishermen groups have been organized.

Biodiversity inventory continued in forests, tree savannah, and fenced fields. Permanent plots were selected.

Socio-economic surveys concerning village history, main tribal groups, land management and use types, and household conditions have been done. The surveys showed that most households are short of food. To achieve food security, gardening methods should be promoted so that food can be also produced during the dry season.

Activities in gardening, handicrafts and bee keeping were developed. The rice cultivation was intensified. Maize and cotton were promoted. Composting was initiated.

ACTIVITY 5: REPORTS, WORKSHOPS ON MODELS

Amazonia

Santarém: Data from the agrodiversity survey and the forest inventories of the water buffalo study are being entered. A GIS-based mapping project is being done for Ituqui and São Miguel islands. The main task, as yet not concluded, involves integrating a map of island vegetation, landsat imagery and vector-based GIS.

Macapá: a Cluster-wide database on agrodiversity with the contributions of the three sub clusters is being developed. A second workshop on management of fallows was conducted

China

With assistance of the Associate Scientific Coordinator and STAT members, the methodology paper on “Household-level Agrodiversity Assessment” was completed and published in “PLEC News and Views”, No. 16.

A working database was set up with assistance of STAT members.

Papua New Guinea

Work continued on consolidating results for completion of principal chapter- length reports.

Uganda

A stakeholders’ field workshop was held in Bushwere in August 2000 to report PLEC findings to-date, show the Agrodiversity potential of Bushwere and also take the official participants to some field exposure of our demonstration activities.

Several reports have been or are being written and will be sent to managing and scientific Co-ordinators soon.

Kenya

The principal report on biodiversity assessment in Kiambu site was completed and submitted.

Tanzania

A complete report on biodiversity assessment is on going and part of it will be used in the paper on agrodiversity assessment and analysis for the PLEC book expected to be submitted mid-October latest. Also a report on organisational diversity and farmers’ incomes and expenditures is being compiled. Data on land tenure and water use in both sites is also being compiled. Workshops at different levels

involving different participants will be conducted in the next half-year. One workshop will be planned for December/January next year during visits to East Africa by coordinators.

Ghana

Information was largely generated for the chapter-length report on “relation of community information to scientific information on resource assessment, and on how the system of resource access and distribution relates to the use of land”. The chapter-length report on interim results of work in demonstration sites is in progress. It is expected that by 01 March 2000, the relevant analysis would have been completed and reported upon together with notes on geographical direction of future PLEC demonstrative work.

Already there exists a substantial body of information relating to government and other official policy. This together with additional information expected from the October 2000 WAPLEC workshop and subsequent meetings with government and other officials, should prove adequate for a definitive statement on implications of PLEC findings for policy, by end of December 2000.

It was expected that a WAPLEC Regional workshop planned for October 2000 and two other subsequent workshops involving Ghanaian scientists, farmers and government officials would facilitate standardization of field methodologies and reporting of results.

Community-level workshops and other forms of meeting numbered more than 40, and took place mostly in the five leading demonstration sites, Amanase Whanabenya, Gyamfiase-Adenya (southern Ghana), Jachie (central Ghana) and Bongnayili-Dugu Song (northern Ghana). A major object was to sensitise farmers to the PLEC ideal of conserving biotic resources within agriculture making use of local knowledge of conservation.

Guinea

The workshop in Kouroussa was organized to initiate and train researchers of Kankan University on PLEC methods.

The workshop in Pita was held to assess PLEC results and to look forward.

ACTIVITY 6: CAPACITY STRENGTHENING (TRAINING)

Amazonia

Santarém:

1. Community lake management training course. Preparations have been made and materials developed for a second course to be given for the São Miguel Island Association beginning in September 2000.
2. Training programme in environmental education for várzea schoolteachers. This activity continues and now involved two new districts, Ituqui, including several communities with which the Project has not worked in the past, and the Aritapera district. These courses are proving to be an effective way to generate discussion within and between communities on local environmental issues and are serving as a starting point for developing community projects to address local agricultural and resource management issues.
3. Household remedies from local Medicinal Plants. Members of the women’s group of the community of Aracampina offered a course in the preparation of medicines to the women’s club of São Miguel Island. This group has now begun to sell medicines not only in the community but also to nearby terra firme communities with which the São Miguel families have contact.

4. Integration of students in training activities: One student is concluding his Master's Thesis. Two undergraduate students of the Federal University of Para are participating in a PLEC study.

Marajó:

Women's groups in Retiro Grande participated in two courses, one on vegetable gardening and the other on the cultivation of medicinal plants. In Jabuti members participated in a course on cheese production with the aim of increasing the quality and hygiene standards of local cheese.

China

A training course on PLEC methodology was conducted for junior cluster members by a scientific coordinator in Yunnan, China, 20-26 July 2000. With a UNU fellowship, Mr. Chen Aiguo has finished his one-year master degree study at University of East Anglia and returned to PLEC-China.

Papua New Guinea

A variety of capacity building activities continued.

Uganda

Training programme was developed with Makerere University: 1) a new University undergraduate degree programme in which PLEC team members input concepts of Biodiversity conservation and Land management has been approved to begin next academic year. The Program is "B.Sc. in Agricultural Land Management"; 2) the undergraduate course "Land productivity assessment and reclamation" incorporates PLEC concepts and approaches. Six diploma-holder field, extension workers (3 males and 3 females) successfully completed this course last semester, in addition to twelve of last year; 3) Negotiations with the Continuing Agricultural Education Centre (CAEC) have been initiated to organise and conduct a short course in Sustainable Agriculture and Land Management using PLEC approaches; 4) a customised computer skills training course is planned for the senior PLEC sub-cluster scientists; and 5) a new graduate junior scientist is recruited into the sub-cluster.

Farmers' training was also conducted. Interaction with 9 (6 male and 3 female) farmers strengthened their capacity in record keeping. One of them was excellent and capable of assisting others. Plans are underway to train this farmer in analysis and interpretation of the kept farm records, so that he trains other farmers. Three farmers (males) were trained in technical designing and construction of maize drying crib. One of them has applied to us for further training and certification of him as an artisan to help the community adopt this technology.

Government authorities at district, sub-county and parish levels were sensitised on the need to integrate PLEC approaches in national development and natural resources conservation programs as well as allocating resources to continue PLEC work when the project has ended.

Kenya

A variety of capacity building activities continued.

Tanzania

All participating scientists and extension staff were provided with copies of the PLEC methodology for biodiversity and agrodiversity assessment. Also all workshops conducted have an item on PLEC and its methodology. This aims at ensuring that farmers, extension staff, PLEC scientists and any other interested members know what we are doing and how we do it. One scientist (Male) is being trained in database management. One other person (male) is being trained in PLEC methods to take over activities previously undertaken by the late Mr. Kaitaba.

Seven on-farm demonstrations were carried out by expert farmers with an average of 30 farmer participants each time. Several farmers participating in PLEC on-farm demonstrations have shown some of the practices adopted from demonstration site discussions. Others have also shown some of the planting materials picked up from their fellow farmers and how they are performing in their own farms. Assistance was also given to expert farmers who are encouraging others to develop and conserve woodlots in Kiserian. All established farmer groups have received training on how to manage and monitor their initiated projects. Farmer training involved 26 women in Kiserian and 28 women in Olgilai/Ngiresi.

Negotiations on involving students from Universities of Dar es Salaam and Sokoine University of Agriculture to do research in PLEC sites are on-going.

Ghana

A variety of activities continued to strengthen capacity building of PLEC scientists, students, farmers and other stakeholders. No opportunity was lost at workshops and other such forums to further explain the purpose and novel approach of PLEC to conservation and development. Even so, there remains much education to be carried out, as the stereotyped orthodox 'top-down' conceptions of research and development is still prevalent in certain quarters including even scientific ones.

Several graduate students were involved in PLEC work, mostly as research assistants. They numbered six in southern Ghana and four in central. The draft of a course that draws on the PLEC approach to resource conservation is nearing completion for approval within the 2000/2001 academic year and possible introduction within 2001/2002 in the University of Ghana. A search continues for funding for the envisaged University of Ghana-based, Centre for applied PLEC work.

Training of farmers in seed/seedlings multiplication and other conservation techniques and methods was arranged. Farmers gained knowledge and skills also through participation in demonstration and various forms of regular interaction with expert farmers and scientists. A plan by central Ghana PLEC called for training of farmers in an indigenous method of cultivating yams in fallow land with collaboration of expert farmers drawn from southern Ghana.

A school children's chapter of PLEC within the primary & junior secondary school at Adenya (southern Ghana) was inaugurated in June 2000. The children then established a biodiverse garden. In southern Ghana, a PLEC farmer demonstrated to schoolchildren the split-corm technique of crop propagation that he had acquired through a PLEC training programme.

Guinea

PLEC-Guinea is being further strengthened by the inclusion of researchers from the University of Conakry, and the University of Kankan, and civil servants and technical agents from the Ministries of Agriculture, Water and Forestry and Environment, and post-graduate students.

A training workshop was organized in Kouroussa for a newly established team of researchers at University of Kankan. This workshop enabled them to be in charge of fieldwork in Kouroussa. Training of young researchers and students in PLEC research methods in agrodiversity and agrobiodiversity continued for field inventory. One senior member attended an English training course in Canada with partial support from PLEC.

PLEC continued to support farmers, groups with materials and organization. The literacy training courses continued for 14 women farmers at Missidé Héiré. Women from nearby villages were trained in dyeing. Women from Dar-Es-Salam were trained in soap making by a retired specialist. Gardening activities were extended to a few more villages.

ACTIVITY 7: NETWORKING AND DISSEMINATION

Amazonia

Santarém:

Regular meetings were held with the main partner organizations: Colônia de Pescadores Z-20, community associations of Aracampina, São José, São Miguel island and Tapará. Close cooperation with the Municipal Secretary of Education, COSAMA (Coordenadoria de Saneamento e Meio-Ambiente) and at the state level with SECTAM (Secretary of Science, technology and Environment) also continued.

Publications: 1) a final version of the Environmental Education Manual for Municipal School Teachers has been prepared and should be sent to the printers by the end of the year; 2) McGrath, D.G. 2000. Book review: *A Água e o Homem na Várzea do Careiro* by Hildegard O'Reilly Sternberg. *Aguá*. In press. 3) WinklerPrins, A. and McGrath, D. Smallholder Agriculture Along the Lower Amazon Floodplain, Brazil. *PLEC News and Views*, Vol. 16: 34-42

Macapá:

Close cooperation continued with the Municipal Rural Workers's Union and faculty and students of the two Family Schools in the region.

Publications: Pinedo-Vasquez, M, C. Padoch, D. McGrath and T. Ximenes 2000. Biodiversity as a product of smallholder's strategies for overcoming changes in their natural and social landscapes: a report prepared by the Amazonia Cluster. *PLEC News and Views*, 15: 9-19. Several other articles are in the review process or in press.

Marajó:

Collaboration continued with the Municipal government, leaders of the municipal Rural Labour Union and community associations in Jabuti and Retiro Grande.

Cross-regions:

Considerable progress was made in developing a common methodology for working with smallholders and strengthening interaction between three groups. A regional network of farmers, farmer organizations and extensionists has been formed. The regional meetings have offered an opportunity for farmers and extensionists to observe each other's work and exchange experiences and plants between different regions. These activities are contributing to the gradual development of local management systems that draw on regional and not just local agrodiversity.

China

A special report on the interview with PLEC coordinators appeared in the newspaper of *Science Times* of China, 23 March.

A working group meeting was organised at the end of April to review progress and plan forward according to terms of reference of Year 3 contract.

Papua New Guinea

A cluster business meeting and field visit to the newly confirmed demonstration site at Ogotana village on the Sogeri plateau behind Port Moresby were organised to review progress and plan forward, 22-25 June 2000. The Principal Scientific Coordinator and Regional Advisor participated in the meeting and field visit.

Stakeholders from University of Papua New Guinea, the Forest Research Institute (FRI), Conservation Melanesia, the Koiari Development Authority (KDA), and the Office of Environment and Conservation (OEC) also visited Ogotana site.

Dissemination:

- A paper titled “Planning for sustainable resource management” was presented at the Momase Regional Workshop on sustainable development planning in Madang, Papua New Guinea.
- A progress report on research and demonstration activities in Ogotana was presented at the Sirinumu Development Company Meeting in Port Moresby, Papua New Guinea. Sirinumu Development Company is responsible for development planning in addressing issues affecting rural living of the Koiaris living in the Sirinumu Catchment area.
- A paper titled “Sustainable resource management and food security” was presented at the PNG Nutrition 200 Conference at the University of Technology.

Uganda

General:

Both national and regional (East African) organisations are now more aware of the existence of the PLEC Project and are corresponding with PLEC. National (Uganda) institutions and persons now refer people inquiring about Agrodiversity and Agrobiodiversity to PLEC-Uganda.

Networking with other national and international initiatives:

1. GEF-funded projects in the region got together early this year through the GEF focal point persons and desk officers of government to prepare joint presentations for COP5 (PLEC was included). Three members (of Uganda Sub-cluster C. Nkwiine, E. Nsubuga and J. Tumuhairwe) participated as technical advisors in the national preparations for Uganda delegates to COP5/CBD. They wrote a joint paper entitled “Agricultural Biodiversity in East Africa – The PLEC Approach to its Conservation”.
2. SIDA funded Regional Land Management (RELMA) Project regularly invites PLEC to participate in their planning, networking and evaluation workshops since 1998. One member participated in the “Regional Land Management (RELMA)” workshop on Networking. Another member participated in the RELMA workshop on Soil Fertility Improvement
3. Other groups and projects including the “National Biodiversity Data Bank”, National Council of Science and Technology, National Environment Management Authority (NEMA) etc. invited PLEC – Uganda in some of their workshops/meetings. One member participated in NEMA programs to formulate the National Soils Policy and also to develop a “Western Uganda sustainable Agriculture and Land Management Project”.
4. PLEC – Uganda Project was requested and did participate in the impact assessment of the “Promoting Farmer Innovations (PFI/Uganda) Project” in Katakwi Kumi and Soroti districts. A draft report has been submitted to PFI/Uganda.
5. International initiatives like the “Millennium Ecosystem Assessment”, “UNEP/GRID and “World Bank Institute, Environment and Natural Resources division” have started correspondence with PLEC.

Publicity:

1. A Television and Radio news item on PLEC – Stakeholders Field workshop in Bushwere was telecast nationwide on 22nd August 2000.
2. Newspaper article on PLEC work in Mwizi appeared in local vernacular newspaper “Enteritis”
3. PLEC scientists and farmers are preparing presentations and exhibitions for the “Rampart Day” 30th September 2000, on the theme “Environment Protection and Tree Planting”. This is organised by the local government of Rwampara County of which the Mwizi demonstration/study site is a part.

Conference participation:

Two members participated in part of the COP5/CBD meetings and presented (i) a paper on “Agricultural Biodiversity Potential in East Africa: Threats and Research gaps” (ii) a poster of PLEC Project in East Africa. (iii) Two local publications, “ITWE Newsletter” issue No. 2 and a fact sheet on “PLEC Project in Uganda” – were distributed. (iv) The UNU/PLEC Brochure was distributed.

Kenya

Two colour posters were prepared to feature agrodiversity in Kiambu site.

Tanzania

Visits have been made to the National Land Use Planning Commission and the National Environmental Management Council to discuss PLEC progress in Tanzania and invite them well in advance for the planned workshops of decision and policy makers later this year.

PLEC was also invited to participate in the national workshop for soil fertility recapitalization. An oral presentation on PLEC experiences was given. Also the document on spatial and temporal climatic changes in Arumeru was used as a reference in developing strategies for soil fertility recapitalization. PLEC findings in Arumeru were also reported in the zonal and national annual research meetings for the year 2000.

One scientist participated in the Global Biodiversity Forum Workshop in Nairobi and presented PLEC experiences in its sites in Arumeru Tanzania. The presentation is currently being worked for journal publication.

Ghana

National and international networking was furthered through preparation of the 5th WAPLEC Regional Workshop in Ghana. The Workshop plan was presented for discussion and approval at the Management Group meeting in Brazil. Three members attended the PLEC meetings in Brazil. Two members visited Guinea for a collaborative fieldwork. One member visited China and Thailand on DAT mission.

PLEC activities continued to involve wide stakeholders including representatives of the Ministry of Environment, Science and Technology (MEST), Ministry of Food and Agriculture (MOFA) and Ministry of Lands and Forestry (MLF). Extension agents, officials at the district level were involved on a more extensive basis, often through initiative of the farmers. The Tolon-Kumbungu District Chief Executive in northern Ghana shows an exceptional interest in PLEC activities in Bongnayili-Dugu-Song demonstration site.

The collaboration and exchange among the demonstration sites continued. Farmer-to-farmer visits involving exchange of seeds and seedlings accelerated within and between demonstration sites. A notable case took place that involved southern Ghana farmers at Sekesua-Osonson in April 2000. A major stride is expected from the planned visit by southern Ghana farmers to their central and northern Ghana counterparts. Exchange of visits and information between the PLEC groups in southern, central and northern Ghana continued.

For dissemination, a 25-minute video documentary of northern Ghana PLEC activities was produced. A video documentary of PLEC activities in southern Ghana is in development. Publications by members include those on yam types, gender and agrodiversity and trees that combine well with field crops in *PLEC News and Views* 15, June 2000. Information was shared with visitors to the WAPLEC head office at the University of Ghana, Legon.

Guinea

Networking continued at different levels. At the community level, collaboration on demonstration activities between groups and villages was expanded at Pita site area. Partnerships among different specialists of technical services in Pita and Kouroussa, important for demonstration site work, were strengthened. At the national level, collaboration between PLEC-Guinea and several Ministries is developing. One PLEC member is now coordinating the PGRN (Natural Resources Management Project) with application of PLEC approaches. Two Ghanaian scientists visited Guinea for a comparative study between Guinea and Ghana from 13 to 20 May 2000.

PLEC activities were widely publicised through the Labé and Kankan rural broadcasting services.

ACTIVITY 8: COORDINATION AND PLANNING

Amazonia

1. Cluster meetings to review work and coordinate project activities.

Members of the cluster have met on several occasions over the course of the year. Two main PLEC activities dominated these meetings, the Midterm Review held in April and the PLEC General Meeting held in Belém and Macapá in May. The latter event, especially, provided an excellent opportunity for cluster members to discuss activities and coordinate plans for the year.

2. Cluster project members visits between sites: Macapá, Santarém and Marajó.

Members of the Macapá group visited Santarém to participate in an environmental education workshop for Tapará teachers. Exchanges of plants continue between groups in Iquitos, Tefé, Santarém and Amapá.

3. End of year Cluster meeting.

A meeting of sub-cluster leaders is scheduled for January or early February in Belém.

China

The China Cluster is now hosted by Xishuangbanna Tropical Botanical Garden, Chinese Academy of Sciences due to a relocation of personnel. A new cluster office has also been set up. As principal members are involved in many different activities for their institutions, they have limited time for PLEC activities. It was recommended that they delegate more responsibilities to other members of the team to conduct demonstration activities.

Papua New Guinea

Cluster coordination and planning is being maintained at the National Research Institute. Financial responsibilities are being maintained at the Australian National University until the PNG Kina improves. Coordination was focused on the preparation of the October national workshop and field day.

Uganda

Co-ordination and planning at the national level has been regular with over 20 planning meetings during this period (both, at office and in field) involving scientists, district and local officials, field staff and collaborating farmers.

The Regional (East African) co-ordination has been regular especially during April and May. The Cluster Co-ordination office sponsored one of the Uganda Sub-Cluster Scientists for the COP5 in Nairobi. Correspondence between the three clusters thereafter has been less frequent.

Correspondence with the higher-level co-ordinators has also been fairly regular, although with some omissions from the mailing list for the Data Analysis discussions and STAT formation announcement until September 2000. This deficiency was recently amended with apologies from those concerned.

Kenya

As Dr. Kiome, the former leader of East Africa Cluster has assumed much more responsibility within his organization in Kenya, and has less time for coordination within East Africa, it was decided that Dr. Kiome be appointed Regional Advisor for East Africa and Leader for the Kenya sub-cluster within PLEC. Group leaders within Kenya will also take on more responsibilities.

Tanzania

Regular communications are being maintained between Ukiriguru and all local collaborating institutions on workplans and implementation of activities.

A visit to the Office of the Vice President and the GEF National Focal Point Officer is planned in relation with preparation of a proposal on biodiversity conservation in Tanzania using the experiences of PLEC in Arusha.

Ghana

The PLEC office in the Department of Geography at the University of Ghana continued to serve as the principal co-ordinating node for PLEC work in Ghana and West Africa as a whole. An Administrative/Research Officer, a Secretary and a Driver staffed the office under the WAPLEC co-ordinating Leader. Subsidiary PLEC Administrative offices were in operation at the Kwame Nkrumah University of Science and Technology (KNUST) in central Ghana and at the University for Development Studies (UDS) in northern Ghana. Administrative and other forms of PLEC work were facilitated by UNU/INRA. Especially the Director of INRA participated in PLEC meetings and other activities.

Co-ordinating of cluster activities within Ghana was achieved mainly through meetings and the electronic media (e-mail, phone & fax), whilst co-ordinating between Ghana and Guinea was achieved mainly through an erratic e-mail connection and a barely functional fax connection. Relevant reports shall, as required, to Guinea, but with the expectation that Guinea would reciprocate by copying her relevant reports to Ghana. Regular contact was maintained with the Managing Co-ordinator and the Scientific Co-ordinators, particularly by e-mail.

Guinea

Coordination was maintained by the leader according to terms of reference. Assistance was provided by a deputy who checks messages and forwards information to cluster personnel. A Ghanaian visit was arranged.