

THE GAMBIA ECOLOGICAL AGRICULTURE DEVELOPMENT PROJECT

2004-2005 Workplan

Presented to

**Environment and Sustainable Development Program
Projects and Innovation Unit – Canadian Partnership Branch
Canadian International Development Agency**

Submitted by

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In partnership with

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1. Project Proponents and Collaborative Agencies

Project Proponents:

Resource Efficient Agricultural Production (R.E.A.P.) - Canada

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REAP-Canada is an independent, research, education and development organization based in Ste-Anne-de-Bellevue, Quebec, Canada. REAP has 17 years experience working with farmers, scientists and the private sector to create greater sustainability in farming systems to advance rural development, both in Canada and abroad. REAP-Canada has been working on Agro-Ecological Village (AEV) and rural development with Philippine partners since 1997 in projects sponsored by CIDA and USAID, and since 2002 with the government of China sponsored by the Shell Foundation. The organization has a leading expertise in working with communities on sustainable farming and renewable energy systems development through participatory on-farm research and development, and capacity building through the support of farmer-to-farmer training networks. In 1999, REAP-Canada was awarded by the Canadian Environmental Network, The International Environment Award for excellence in programming under the theme of Climate Change mitigation.

Njawara Agricultural Training Centre (NATC)

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Njawara Agricultural Training Centre (NATC) is a non-governmental organization established by the Njawara community for the purpose of training farmers in sustainable agro-forestry techniques to improve farm production and profitability while promoting sustainable natural resource management. Since 1990, NATC has worked to develop its in-house training capabilities and now has a relatively large compound for residential training with 6 hectares of sustainable agriculture demonstrations. Their flagship project is a Farming System Training Program (FSTP) for short-term adult training and long-term youth training where farmers spend up to nine months in training at the institute. The 6-hectare site includes training areas and demonstrations for nursery establishment, soil fertility and management, live fencing, gardening, orchard and woodlot management and small animal husbandry. Through the GEAD project, NATC is looking to expand its outreach to communities to compliment its current centre based training and plant material improvement programs.

The Gambia National Agricultural Research Institute (NARI)

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The Gambia National Agricultural Research Institute (NARI) is the Gambia's primary agricultural research and development institute focusing on the advancement of livestock, horticulture, agronomy and agro-forestry systems. NARI recognizes the high cost of the

traditional extension systems for agricultural research and development existing in the Gambia and is interested in continuing to develop its experience with participatory approaches for plant material improvement as a strategy to increase its impact in the country. It is presently supporting the Participatory Learning and Action Research (PLAR) approach for rice improvement in The Gambia. Through years of research and extension, NARI has a developed understanding and resources to support plant material improvements in rural communities in the Gambia. The involvement of NARI's agricultural scientists in the partnership will provide an additional level of technical capacity building to the Farmer-to-Farmer training networks being established.

Collaborative Agencies:

Based in the Lower Saloum District of the Central River Division for the past 17 years, Village AiD- The Gambia (VATG) is the only international agency operating in one of the most impoverished areas of the Gambia. Its program began with infrastructure development projects and has expanded to food security and literacy and gender development programs. VATG targets the development of marginalized communities in the Gambia through integrated, self-supporting programs such as REFLECT literacy circles, the Village Action Fund micro-finance scheme and agricultural development through the support of small-scale community gardens. REAP-Canada is developing its ESDP partnership with Village Aid and will have a Canadian International Intern based at the organization for the next two years. VATG will assist NATC and NARI in project activities in Lower Saloum.

Support from other government units will assist the projects development and contribute to local capacity building. The local Multi-Disciplinary Facilitating Teams (MDFTs), which consist of governmental and non-governmental extension workers, will be used to co-facilitate group discussions or PRA's in the targeted communities in CRD. Additionally, the Social Development Fund (SDF) and Rural Finance support the construction of wells and community gardens and are active in micro-credit programs, including the nation wide Village Savings and Credit Associations (VISACA's). They will be active in mobilizing resources for community infrastructure development. Finally, the West African Rural Development Project (WARD) and the Rural Development Institute (RDI) will also serve as potential development/agriculture training sites for staff and as a source of experienced PRA practitioners.

2. Local Context/Needs Analysis and Environmental Degradation in the Gambia

The Gambia is one of the most challenged nations on the globe. In the year 2002, the Gambia ranked 160th out of 173 countries in the Human Development Index (measuring indicators such as quality of life, life expectancy, education and income), with nearly 60% of the population below the international poverty line and the highest population growth rate in the world at 4.2% per annum. Gambia's economy is under-developed, as it has limited natural resources, a narrow economic base, and misused human resources. According to a 1992 study of poverty in the Gambia, 75% of the rural population experiences a chronic food deficit for at least 2 months of the year during the rainy season from July to August, when income sources are also scarce.

Crop production is the predominant agricultural activity in the Gambia, followed by animal husbandry, rice farming, and small-scale vegetable gardening. Crop production centers on the cultivation of millet, maize, and groundnut, and is mostly undertaken by men during the rainy season. Rice farming and vegetable gardening commonly occurs in the lowland regions and is the main responsibility of women. There is a compelling need to diversify farming in the Gambia. Nearly 75% of the rural population are subsistence farmers growing mostly groundnut, millet, corn, beans, rice, and sesame. The intensive cropping of peanuts by both small-scale and large-scale farmers has left the national economy vulnerable to international market fluctuations and resulted in serious food security and decline in soil quality. Since the 1970's, world prices for groundnut have rapidly declined, leaving Gambia's export industry in financial crisis. Because of this they have maintained a negative trade balance and continue to rely heavily on international aid organizations for social and economic development. With an emphasis on cash cropping, farmers have to use input-intensive farming practices in order to sustain yields. They also lack the food crops necessary to feed themselves and are therefore more reliant on capital in order to purchase food for personal consumption. The country as a whole is also becoming more reliant on food imports to feed its rapidly growing population. Diversifying farming systems in the region would increase food security for families and offer significantly more opportunities for the incorporation and full participation of women in all aspects of food production from planting to marketing and value added processing.

In a 1998 government study into strategies for poverty alleviation, 91% of extremely poor households were dependent on agriculture. Furthermore, many poor and extremely poor households were large in size, with 41.6% of extremely poor households housing 6-10 people. Larger households are normally associated with rural agricultural communities, where bigger families are encouraged to provide more hands for farm labor. The majority of women in the rural areas were found in a constant energy deficient state, caused by poor dietary intake, heavy workload, and a high disease infection rate. It is evident that women in the Gambia in particular have very difficult lives and the advancement of ecological agriculture is of paramount importance to improving their quality of life and restoring the natural resource base of their environment.

In addition to the dire social and economic conditions, the environmental quality of Gambia is in a long-term trend of ecological decline. Farm practices contributing to declining soil fertility include mono-cropping, planting up and down the slope, crop residue burning and leaving the fields fallow after harvest. Lack of soil cover and erosion control is also causing topsoil to be lost into watercourses during heavy rainfall events or by intense winds. Forests are being heavily denuded by the growing need for fuelwood, dry-season livestock forage harvesting, farmland development and the burning of agricultural fields. Free range sheep, goat and cattle rearing is also found throughout the Gambia and is devastating to the integrity of the countryside as it destroys crops and limits farmers cropping options, while also being destructive to permanent vegetation. Significant decreases in crop production (most farmers in the targeted communities are reporting half the productivity of 10 to 20 years ago) and increasing population pressure in the rural areas is leading to the early exhaustion of food stocks. Farmers are subsequently forced to search for income to supplement household food requirements for the few months leading up to the next harvest. This period is increasingly being known as the "hungry season."

A holistic and integrated approach is required to respond to these interrelated challenges of environmental degradation, diminishing natural resources, reduced agricultural productivity, rapid population growth, hunger and high poverty rates. New efforts are required to implement effective sustainable rural development models to respond to these problems.

3. Background for Phase 1

The Canadian International Development Agency (CIDA) provided funding for an Exploratory Phase Mission to the Gambia, which examined opportunities to create partnerships and strengthen the partners' current efforts in ecological farming systems and sustainable community development. In August 2003, the Executive Director and a Senior Project Manager from REAP-Canada met with NATC, VATG, farm leaders, and government officials in Gambia to discuss in detail how to advance ecological farming in the Gambia and to learn of the particular development needs of the local communities. REAP-Canada staff also had two days of meetings with Agronomy and vegetable research scientists at NARI in August 2003 to discuss opportunities for plant material improvement through participatory plant breeding and local adaptability trials in the NBD and CRD. In addition, since September 2003, two REAP-Canada youth interns supported by the CIDA Youth International Internship Program (YIIP) have been working in The Gambia to support programming, one with NATC and the other with Village Aid with four more to be stationed at the two organizations over the next two years. Through the exploratory phase and internship program, the basis for a solid partnership has been established. The partners and local communities have made strong commitments both to build project activities that promote sustainable agriculture and community development and to learn and develop from each other. Each organization brings to the table unique achievements and areas of specialization that will bring positive advances to the international development community.

Conclusions developed through partner, beneficiary and stakeholder dialogue during the Exploratory Phase indicate that a holistic and integrated development approach is required to respond to the challenges in the Gambia including soil infertility, environmental degradation, and lack of income generating opportunities. Introducing diversified ecological farming systems would not only increase the soil's fertility but also enhance crop production, suppress weed growth, inhibit pests and diseases, increase food security, generate more income, reduce use of chemical inputs and improve the health and nutrition of farmers and their families. The local partners are currently working together with REAP-Canada staff and the local communities to develop activities that will support the development of ecological farming systems using the AEV Development framework. Future activities to assist the communities were agreed upon by the project proponents and beneficiaries; these include enhancing their existing training modules, establishing learning farms and plant improvement programs using participatory approaches, as well as aiding in farm planning and diversification and supporting farmer-to-farmer training networks. REAP-Canada has developed the *Agro-Ecological Village Model* to support rural communities through the creation of self reliant, integrated and ecological food and energy systems. This model has been successfully implemented by REAP-Canada and its partners in the Philippines funded by CIDA and in China funded by the Shell Foundation. The general characteristics of Agro-Ecological Villages appropriate for agrarian communities in the Gambia are outlined and compared to conventional approaches in Table 1.

Table 1. An Agro-Ecological approach to rural development

	Ecological System	Conventional System
	<ul style="list-style-type: none"> • <i>Emphasizes self reliance & empowerment through maximizing on-farm resource utilization</i> • <i>Market development oriented towards import displacement</i> • <i>Minimizes human impact on local environment & biosphere</i> 	<ul style="list-style-type: none"> • <i>Emphasizes export markets to pay for imported goods</i> • <i>Approach leaves communities vulnerable to external forces</i> • <i>Degrades natural resource base locally and increases greenhouse gas emissions</i>
Food Supply	Internal and plant based, emphasizing farm fresh production of in- season vegetables, rice, corn, root crops, fruit, fish and eggs	Food imported into community including rice (through loans), canned and dry fish, meat, pop, noodles, crackers, etc, imported livestock feeds
Soil preparation and on-farm hauling	Draft animals like donkeys which reproduce	Tractors that require maintenance and replacement, and are fueled with diesel and gasoline
N Fertility	Intercropping, nitrogen fixing legumes, azolla, mudpress, soil mineralization, donkey and horse dung	Purchased urea fertilizer
Minerals	Minimal erosion, recycling of rice hull ash and mudpress, donkey and horse dung, good soil structure	Purchase Potassium and Phosphorus fertilizer
Seeds	Community seed banking of open pollinated seeds, new seeds assessed in trial farms, ongoing on-farm plant improvement	Purchased hybrid seeds, no local adaptation trials, seeds derived from corporations, transgenic seeds being developed
Weed Control	Use of local organic treatments such as neem tree solutions, mechanical weeding devices, crop rotation, good soil fertility management, mulch farming	Herbicides and tillage
Insect control	Biological control strategies, resistant cultivators, balanced fertility	Insecticides
Disease Control	Resistant cultivators, diverse cultural management strategies	Fungicides
Irrigation	Modest requirement and efficient usage, provided by alternative water supply options	Gasoline/diesel powered pumps
Crop drying	Uses solar or biomass energy	Fossil fuel powered crop dryers
Marketing	Emphasizes internal self reliance first, then import displacement in local markets and value added processing	Monoculture production emphasized and sold to distant markets in the country or exported
Household cooking	Rice hull cookers, solar powered cookers, efficient wood stoves, biogas, all biofuels derived from the farm	LPG fuel stove, open fire cooking, kerosene as fire-starter, fuelwood gathered off farm or purchased
Electrical power	Low requirement, renewable sources explored if feasible	High requirement and from fossil fuel based mega-projects
Housing	Mud bricks, farm derived wood, rammed earth	Cement block housing

Central to the AEV approach is the conviction that ecological land management and sound community organizing form the basis for sustainable community development. This model emphasizes participatory development processes using a four-step plan (institutional building process, capacity building and training, farm planning, field level implementation). Over time, a community's adoption of an Agro-Ecological approach will:

- Provide farming families with food security, increased income levels and improved nutrition
- Enable more active participation of both men and women on farms and in local economies
- Increasing income generating opportunities in rural areas
- Ensure the long-term productive capacity of the land for food production
- Improve surface and ground water quality and quantity
- Reduce health risks to food producers and consumers
- Decrease greenhouse gas emissions through reduced minimized crop residue burning
- Help protect and restore biodiversity

In addition to improving the lives of farming families in Lower Badibu and Lower Saloum, the concept of the Agro-Ecological Village could also become the basis of a development model that meets the dual objectives of poverty alleviation and environmentally sound development in other regions. From our experience, this strategy has proved to be the logical evolution for rural development programming in agrarian areas.

The proposed project programming supports CIDA's mandate and policies in many areas, including:

- Basic human needs
- Women in development
- Agriculture
- The environment
- Capacity building for southern organizations
- Benefits to Canada and engagement of the Canadian public

4. Project Rationale

Project Goals

1. To introduce the Agro-Ecological Village (AEV) development model as a new approach for sustainable community development.
2. To train farmers on Agro-Ecological farming methods as a means to reduce poverty, enhance food security, increase self-reliance and reduce environmental degradation in some of the most impoverished areas of the Gambia.
3. To improve the plant material base for ecological farming of community gardens and farms in the NBD and CRD through a participatory plant material improvement program.
4. To encourage the development of gender-sensitive agrarian communities through participatory assessment, farmer-to-farmer training and on-farm research.

Project Objectives

1. In each community, to strengthen the farmer’s organizations, complete an effective Participatory Rural Appraisal (PRA), begin a Participatory Monitoring and Evaluation (PM&E) program and utilize participatory processes and support gender development for all project activities.
2. To train farmer trainers in the NBD and CRD, establish a farmer-to-farmer training network in the NBD and develop ecological farming training modules to support the development of ecological farming systems in the Gambia.
3. To establish learning farms and gardens to introduce improved plant varieties of vegetables, field crops, grasses and tree species, and further develop ecological farming practices such as intercropping, sustainable livestock management and agro-forestry and appropriate technologies such as biofuel cookers and improved farm implements.
4. To complete ecological farm plans for individual households and assist communities in the development of the plans.

5. Project Beneficiaries

The project will directly reach approximately 150 families in the communities of Njawara and Kerr Ardo, located in lowland and upland ecosystems respectively. Several families usually live in one compound of up to 30 people; each family is housed in different units or rooms. As such targets and outputs will focus on the number family units involved. Projected activities in the two main villages will include farmer-to-farmer training and assistance for farm development and diversification. Other beneficiaries include approximately 500 farmers and their family members in three surrounding villages. They will have the opportunity to participate in sustainable agriculture trainings and represent their villages in committees formed to solve regional environmental issues such as the free range grazing problem. These include Torro Ba, Torro Tayam, and Panneh Ba. Please refer to Table 2 for village populations defined by recent Participatory Community Plans or interviews with villager elders.

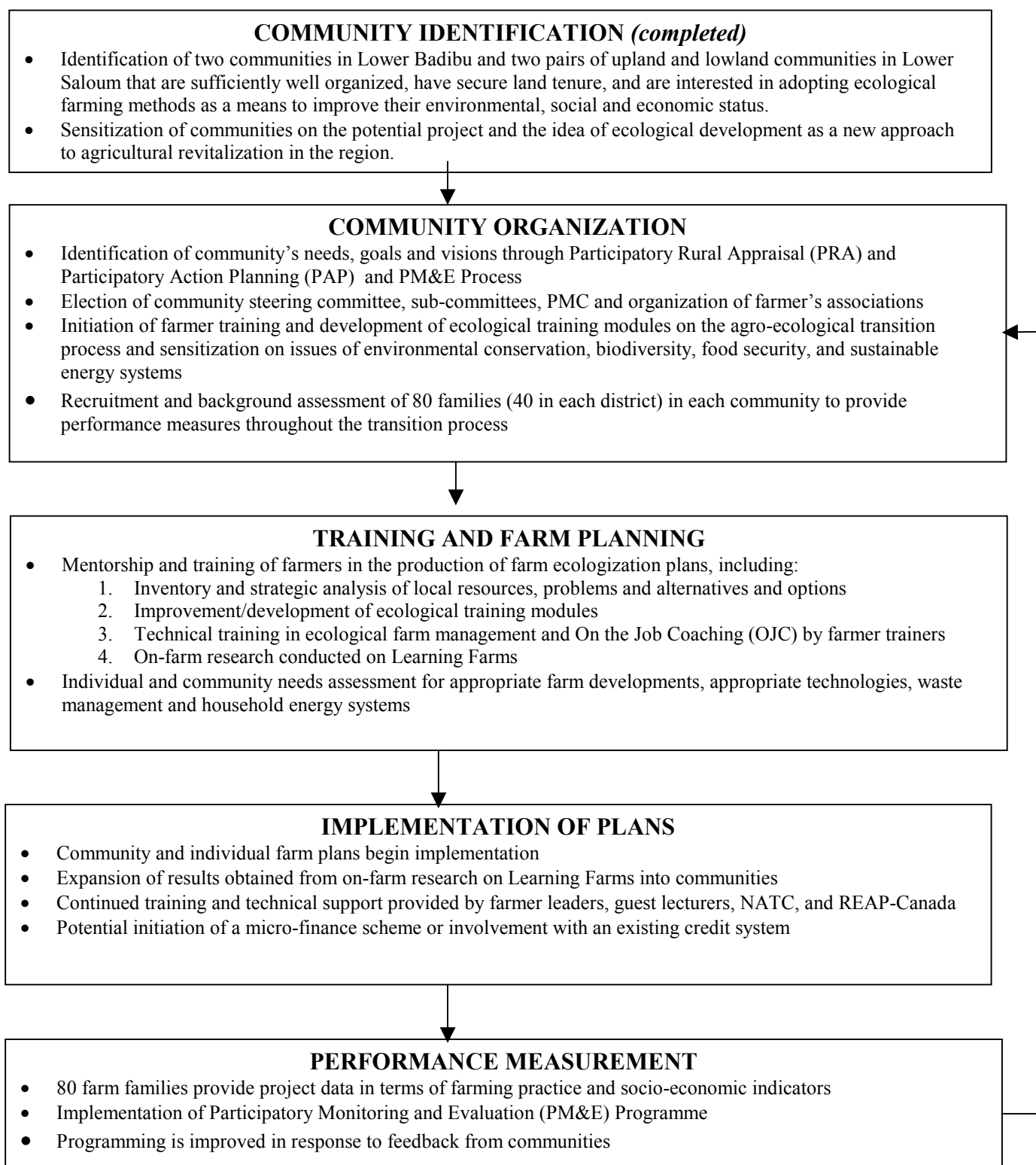
Table 2. Village Populations of selected communities in the North Bank Division.					
Village	<i>Njawara</i>	<i>Kerr Ardo</i>	<i>Torro Ba</i>	<i>Torro Tayam</i>	<i>Panneh Ba</i>
Population	852	1150	716	500	150

Additionally, the project will benefit the communities in the Lower Saloum District. Project Proponents are enthusiastically looking to increase activities in this area in the future with the establishment of an ESDP funded partnership with Village AiD. As such, some project activities will include basic agronomic developments in these communities similar to the interventions being made in Lower Badibu including the training of farmer trainers and the introduction of improved plant materials into community gardens and farms of leading farmers in the CRD.

6. Workplan for Project Activities

There are five basic steps in the implementation of the Agro-Ecological Village Development Model: community identification, community organization, farming planning process, implementation of plans, and performance measurement. For illustration and greater detail of these steps, please refer to Figure 1.

Figure 1. The 5 step process of Agro-Ecological Village development implementation



6.1 Community Identification

The following criteria were used to select the two beneficiary communities:

1. Demonstrated need for increased food security and improvement of farming systems
2. Internal organization and farmer leadership and proven dedication to improving economic situation, addressing gender issues, and the utilization of agriculture to address food security issues.
3. Agricultural similarity and complementary resources and knowledge that can be shared between other villages
4. Healthy relationship with other villages historically cooperating in regional activities.
5. Secure land tenure and a keen interest in improving the communal village area.

Village meetings have taken place with representatives from each beneficiary community to sensitise them about the development of this project. Participants included members of the Village Development Committee in Lower Badibu, as well as village heads, local farmers, and other villagers. The model was openly accepted by the participants and enthusiastic discussions regarding the implementation of the AEV Model occurred during and after the sessions.

Njawara and Kerr Ardo were chosen as pilot communities in the Lower Badibu District. Both villages are located only a few kilometers south of the Senegal border, situated within the same watershed, and subject to similar Sahelian climactic conditions. Background information for Njawara was obtained from the Participatory Community Plan (PCP) report, village meetings, and informal interviews with villagers and NATC employees who are long-term citizens of Njawara. Background information for Kerr Ardo was obtained from a village meeting and interviews conducted with villagers and NATC employees who have been involved with Kerr Ardo citizens through their training program. Select farmers from both Njawara and Kerr Ardo have participated in either the short-term adult or long-term youth training programs. Both communities are predominantly Wolof speaking.

Njawara, NATC's hometown, is located in the lowlands adjacent to a tributary of the River Gambia. Agricultural activities in Njawara consist of cash crop and subsistence farming, rice farming, and vegetable gardening. Kerr Ardo is located approximately two kilometers east of Njawara. Agricultural activities in Kerr Ardo consist of cash crop and subsistence farming and cattle rearing, horticulture is not possible due to limited groundwater availability.

Additionally, three adjacent villages located within the same watershed, Torro Tayam, Torro Ba, and Panneh Ba, have been sensitized about the GEAD project. These villages will have secondary involvement in the project by having village representatives involved in the discussion of regional environmental issues (such as livestock management and watershed issues) and being openly invited to the farmer-to farmer training sessions.

6.2 Community Organization

Drawing on the Project Proponents experience working with communities, the beneficiaries will undergo an organizational development process. The needs, constraints and opportunities of the community members will be analysed through a Participatory Rural Appraisal (PRA), and their development goals and strategies will be outlined. Specific activities, targets, and monitoring indicators will arise out of this initial PRA process.

The participatory rural appraisal (PRA) approach emphasizes local knowledge and enables local people to make their own appraisal, analysis, and plans. It also increases the capacity of the local organizations to perform their own ongoing appraisals in a flexible and dynamic manner. A record of discussions, and community needs/objectives will be kept and analysis and the development of recommendations for an action plan will be prepared in a formal report. The PRA will involve a team of people working for approximately four days in each community completing workshop discussions, analyses, and fieldwork. The PRA team will be led by the Socio-Economic department of NARI headed by Mr. Musa Suso working in conjunction with local partners, REAP, the community Village Development Committee (VDC) and government extension workers (MDFT's) working in these communities. PRA techniques will continue to be used by project staff to collect data from project beneficiaries and encourage group discussions on project and community issues.

Project Proponents, community organizers, farmer trainers and community members will form a Project Management Committee (PMC) to lead the development process and to facilitate farm management decisions. The PMC will involve key male and female farmers in the village and will oversee the development of the farmer to farmer training network, the implementation of farm plans, the development of learning farms and other project activities. In the Lower Badibu District, sub-committees will be formed to tackle regional environmental problems within the watershed. Consisting of male and female representatives from all five villages, these sub-committees will be involved in discussing issues such as livestock management and soil erosion.

Strengthening the capacity of Farmer's Organizations

Capacity building shall be an ongoing process in this project and a cross-cutting issue in all components. The main aspects of the capacity building process shall be:

- Increasing farmers' capacity through trainings using participatory approaches to analyse their local environment and apply ecological principles to their farming methods.
- Institutionalise approaches of mutual learning, support and information exchange within the community (local)
- Institutionalise approaches to network information and experiences outside the community (regional and national)

Community Groups

One strategy of the Agro-Ecological Village development model, which emphasizes the empowerment and effective use of community groups in rural development, shall form the basis of capacity building process. The project will facilitate the establishment of local Village Development Committees (*VDC's*) so as to enhance their active participation in local governance. Locally elected farmer leaders will link the project into local governance structures to encourage rural development. Farmer groups will play a key role in implementing the project and take some level of responsibility in managing the farmer trainers. The groups will help create a social infrastructure that ground activities into farming communities. The groups link farmers in different communities in obtaining information on farming techniques and the latest agricultural trends, sharing equipment or post-harvest facilities and provide support and learning. They will also facilitate cooperation with local government units, and support marketing efforts through the creation of farmer co-operatives. Community organizers shall develop the ability of local institutions to take a more active role in the community's development process. One community organizer will work in each community, and will be actively involved in the trainer's trainings, the farmers' training sessions and the development of local community infrastructure. Encouraging the efforts of farmers to work together to address local problems is critical to effective and low

cost rural development.

Farmer Technical Groups

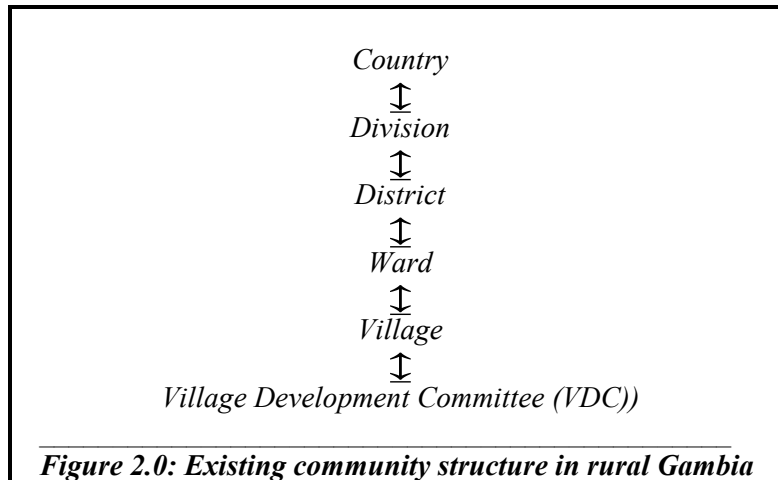
One aspect of the Agro-Ecological Village model for sustainable community development would see the eventual establishment of farmer technical groups specialized in certain agricultural techniques or approaches. The members of this group would participate on their own interest and of their own accord. These technical groups would provide an effective, participatory and consensus-based method in dealing with environmental issues including water conservation, soil erosion, plant improvement, soil fertility, and environmental remediation and re-vegetation. They may also include socio-economic issues such as marketing policies or economic strategies. These groups would select relevant topics and members would be local farmers who are interested in the subjects. Mixed groups related to gender specific activities (such as gardening, groundnut production) would be encouraged. The activities of the groups will include brainstorming, elaborating discussions, field-testing, researching new information or techniques and fostering teamwork and cooperation within and between the various farmers group and local partners. These groups are designed to enhance the confidence of local people relating to their own creative thinking ability and capacity for local knowledge generation.

Kitchen Table Discussions

Once the development of the project is underway, the farmers will be encouraged to have a series of informal “kitchen table” discussions once a week when farmers have more time available (Jan-May). The participants would do so of their own interest and accord. These discussions would mirror the approach of the Ecological Farmers Association of Ontario (EFAO), an organization of Canadian farmers. The discussions would be prepared by the local farmers, and geared towards a cross learning of ideas and a tangible or practical output. They would focus on subjects requested by the farmers and could include topics such as alternative energy (animals, plants) or medicinal/holistic treatment by farm products. Discussion groups involving women’s issues would also be actively encouraged.

Local Linkages

The project aims to create stronger linkages between the local partners implementing the project, research institutes such as NARI, the government extension workers (MDFT’s) and the beneficiaries or local communities. Project activities will integrate local farmers efforts with each other and with government officials and improve information transfer networks and communal decision-making and problem solving. The existing organizational structure of rural Gambian communities can be seen in Figure 2.0



6.3 Farmer-to-Farmer Training

The farmer-to-farmer training process allows local farmers to take the lead in community capacity building. The investment in empowering and training farmers generates a high capacity to continue the development process. Additionally, the investment in strengthening the farmers’ institutions, and developing bottom-up training programs to complement the traditional top-down infrastructure are key features that will help continue the development process in communities beyond the project’s lifespan.

Fundamental to this approach is to develop experienced farmer trainers, known as "first liners" to lead training sessions. These individuals will be progressive farmers having a sound understanding and skills in farming, understanding of social and ecological issues and effective organizational and facilitation skills. *Please refer to Table 3 for Guidelines for the effective facilitation farmer-to-farmer training sessions.* Other farmers still undergoing the process of becoming an experienced farmer trainer, will be trained as “second-liners” to re-echo these lessons in their local areas to disseminate the information. During the session, these second liners will play a support role, learn through actual experience and gain confidence in the training process. Young farmers who have high potential for development will also be encouraged to become trainers during the project, and will be exposed to various subjects and trainers. The farmer trainers will be developed with participatory methods, so as to actively engage all members of the community including the women and the shy farmers. Trainer's training sessions will be provided to upgrade trainers on a periodic basis. Through this participatory peer education approach, trainers are continuously being developed, and groups are kept small as farmers are exposed to a diversity of farmer trainers and issues. This training approach can be adopted for instructing individuals how to employ organic farming, diversify their production, develop their farm in a holistic manner, and every other aspect of the agro-ecological village development.

Table 3: Guidelines for the effective facilitation of farmer-to-farmer training sessions	
<i>Important facilitating skills:</i>	<i>Barriers to effective communication</i>
<ul style="list-style-type: none"> • Organize the topics • be prepared for the topic • organize the visual aids • have a good grasp of the ideas to quickly answer questions • know how to facilitate the flow of discussions 	<ul style="list-style-type: none"> • Message is not clear • Seminar/meeting is not well-organized • Language/ technical terms not understood

<ul style="list-style-type: none"> • know how to get the attention of the listeners • know how to make use of gestures to emphasize his/her point • have self-confidence and be comfortable speaking in a group • give the audience undivided attention through frequent eye contact • know how to control unnecessary mannerisms/bossy language • avoid unnecessary repetition of words/avoid redundancy • Incorporate distractions into the context of the training • Know how to manage time • be creative • have a sense of humor • be emphatic • be committed and focused • be open-minded to comments/criticisms • have a clear and audible voice • have legible penmanship • be sensitive to the needs of the participants • know how to gauge the level of listeners 	<ul style="list-style-type: none"> • Divided attention on the part of listeners (personal problems may get in the way ie: participants are hungry) • Audience is uninterested in the topic • The speaker is unable to get the attention of the listeners • Excessive noise • Distractions
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It is essential that women are enlisted as trainers in the farmer-to-farmer training program. The purpose of this is threefold, first to build the capacity of these individual women as trainers, secondly to have women engaged as active participants in the project and ultimate in the community, and finally because it is from women that other women will learn best. This is one of the most challenging aspects of the programming as the women in these communities may be poorly educated and painfully shy. However, we must recognize that the involvement of women in every aspect of the project is fundamental to the improvement of the quality of life for the farmers, for the cohesion of the villages, and for overall success.

During the initial phase of this project, villagers will identify approximately 20 key farmers (or “first liners”) in total, both male and female, in Lower Badibu to act as lead trainers to the other farmers. These first liners will be experienced farmers who have proved their dedication to the advancement of farming, are motivated and have a progressive and resourceful community development orientation. They will attend preparatory training at NATC, partly facilitated by VATG, where they will be trained on topics such as how to be a trainer of trainers, group management, participatory community planning, the Participatory Learning Action and Research (PLAR) educational approach, as well as the REFLECT method employed in VATG literacy circles and skills development. They will also be linked with micro-finance organizations and involved in the development of the training module and gender strategy for their respective communities. Efforts will be made to continually recruit potential farmer trainers (“second liners”) and to encourage both men and women to participate equitably in trainings, both as trainees and trainers. Through the development of this farmer-to-farmer network, village farmers will have the opportunity to gain confidence through participating in and facilitating farmer-to-farmer trainings. A strong emphasis will be placed on providing trainings in the form of on-site visits whereby trainees are exposed to sustainable farming practices on progressive local farms called “learning farms.” For additional technical support, short-term farmer training can be provided at NATC on an as-needed or requested basis. In this case, NATC and the first liners will work together to develop the framework of the respective training sessions identified.

VATG will also be involved in the farmer-to farmer trainings in Njawara to support participatory community development, mobilization and networking, promote local ownership of the project and ensure effective project sustainability after project completion.

Development of Training Modules

A “ladderized” training program is utilized in the Agro-Ecological Village approach. Ladderized trainings are a series of training sessions presented in an order that gradually increase the technical level of information available to the farmer. The program will include formal training manuals dealing with sustainable farming techniques and farm development, but will also involve applications and mentorship including cross-site visits, on the job coaching during the growing season and kitchen table roundtables in the winter. For each training topic, an interactive training module will be developed. The modules describe all of the important concepts that should be conveyed to the farmers, and will act as a guide for the trainers to be delivered in conjunction with the on-farm test trials.

Each community will continue to undergo custom training needs analysis to determine which training sessions are most relevant to the farmers. Ongoing monitoring of the applicability of the training programs will be evaluated through expectations and feedback from participants and trainers. Initially, a sensitization of the communities is important to deepen the level of understanding of the social and economic situation the farmers are facing, both locally and nationally. The participatory, problem-solving nature of the trainings is designed to energize the farmers and encourage them into action in their communities.

Initially identified as areas of interest by project staff and communities, the first training modules that will be adapted for local use in the Gambia during year one of the project may include those listed in Table 4.

Table 4: Agro-ecological Village Potential Farmer trainings, seminars and activities			
Training	Module Completed	Training Completed	Existing Module
Agro-ecological Village Project Orientation	-	Nov 2003	-
PRA (Participatory Rural Assessment)	-	March 27-April 12/04	-
Introduction- Principles of ecology and sustainable agriculture <ul style="list-style-type: none"> - Ecological Principals - Agriculture in the Gambia - Ecological Farming 			REAP
Soil Fertility and Organic Components of Soils <ul style="list-style-type: none"> - Introduction to Soil Fertility and tropical soils - Soil Properties <ul style="list-style-type: none"> ▪ Physical ▪ Chemical ▪ Biological - Organic components of soils <ul style="list-style-type: none"> ▪ Organic Matter ▪ Composting ▪ Manure management 			REAP NATC
Cropping Systems <ul style="list-style-type: none"> - Basic Principles - Benefits of cropping systems - Examples of Crop Rotations 			REAP

- DIFS (Diversified Integrated Farming Systems)			
Green manures and cover crops			REAP
Weed management control			REAP
Disease and Pest Control / Integrated Pest Management (IPM)			REAP NATC
Soil and Water Conservation			REAP
Livestock Management			REAP NATC
Holistic Farm Planning and Design (food footprint)			REAP
Agroforestry			NATC
Horticulture and Dry Season Vegetable production			NATC
Nursery Management			NATC
Gender			NATC
Food processing, preservation, storage and marketing			NATC
CBO Seminar			NATC
Training Of Trainers (TOT)			-
OJC (On the job coaching/mentoring)			-
Hungry season food security			-
Plant improvement (adaptability, farmer-led breeding)			-
Seed conservation, plant material propagation and multiplication			-
How to be a trainer of trainers			VATG
Group Management			VATG
Participatory Community Planning			VATG
Participatory Learning and Research (PLAR)			VATG
REFLECT Method			VATG

Training Format

The training schedule will be set up by the PMC, who will determine the most appropriate timeline based on the stage of development the local farmers are at. The trainings should not be conducted with more than two topics at a time, and should be done in a participatory manner involving both whole group discussion and small group activities with both lecturing by the trainers and speaking/analyzing done by the farmers themselves. Special efforts shall be taken during the trainings to involve the women in activities and discussions (it may be beneficial to break them into small groups of women only at the beginning if they are uncomfortable or quiet) to ensure they are actively participating. A 2 hour “situational” analysis will be held on the first morning of each session to discuss the social, economic, and environmental current events affecting the farmers. This process furthers the sensitization of the farmers and encourages them to actively evaluate their local and national conditions. At the end of the training session, it will be reviewed whether the expectations have been met, and a record of both the positive and negative feedback made to further improve the training process.

The trainings will last for 2 days, but can be extended from 1-3 days depending on the need and circumstances. They would be held all year round with the majority concentrated in the months when farmers are less busy. The training sessions will have from 10 to a maximum of 25 participants. The training will be free for participants and healthy, well-balanced meals will be provided during the sessions. The farmers will generally not be reimbursed for the trainings to ensure the sustainability of the community groups after completion, as well as to ensure the farmers see the free education as a benefit and attend for interests’ sake. The trainings will be held in an area close to the locations of the farmers so that they will not have to travel far, in a building with

adequate facilities (chalkboard etc.), light and fresh air. Trainings will also be held outdoors or “off-site” during the warm season where participants are less susceptible to distractions to enable more focused and extended discussions. There is also more opportunity for discussion than in a formal setting, and shy people are encouraged to ask more questions. Farmers are generally more comfortable in rural settings, and the off-site trainings can provide the opportunity for visits to nearby farms. The trainings will be primarily during the winter season and at other less busy times during the year.

6.4 Farm Planning

When the communities have undergone sufficient training, they will engage in an extensive farm diversification planning process. Phase 1 will involve the training of “first-liner” farmer trainers in ecological farm management. After the initial training of the first liners, they will train others in their communities to be “second liners” who can eventually conduct trainings on farm development on their own. In this way the process of training and development of new local trainers in each community can continue. The farmer trainers will provide support to other farming families to create detailed action plans for their individual farms. These plans will include land use maps, workplans and predicted expenditures for the proposed farm diversification and ecologization. Farmers will discuss sustainable farming strategies including how to conserve water and soil, improve local soil quality and minimize the use of synthetic pesticides and fertilizers.

To develop their farm plans, farmers will utilize seasonal calendars, transect maps, workplans, cropping systems and rotation information, green manures, 5 and 10 year land use goals, predicted expenditures and other planning techniques. Farmers will discuss strategies to conserve water and soil and minimize the use of fossil fuels and synthetic pesticides and fertilizers. Individual farm transformations may include intercropping, diversified vegetable and grain legume production, organic rice cultivation, improved crop rotations and sustainable agro-forestry activities. The farm planning process will provide the basis for farm transformation and plans will be revised as necessary through the conversion process. Farmers will be advised to concentrate most of their planning efforts on the first few years of transformation, although less detailed planning of longer term farm plans will be encouraged. Community members will also create management plans for communal areas. They will assess their own need for appropriate technologies such as irrigation, and ecological cooking energy, as well as farm implements like hand-held tools, micro-irrigation, and draft animals.

The ecological farm-planning guide will be used as the main tool for guiding the communities through their farm planning process. The existing ‘Introduction to farm planning’ training module will be modified on an ongoing basis to improve suitability for farmers and the local agronomic situation. These ongoing modifications to the farm-planning module will be made by the farmer trainers themselves. The training and on the job coaching of the farmer trainers to complete this activity with communities will be made by local technicians working in partnership with NATC and NARI.

Farmers will be advised to concentrate most of their planning efforts on the first year of transformation, although less detailed planning of longer term farm transformations will be encouraged. They will assess their own need for appropriate technologies such as bio-gas and solar cooking and heating systems, as well as farm implements like hand-held tools, micro-irrigation and draft animals. The farm planning process will provide the basis for farm transformation and plans will be revised as necessary through the conversion process. Monitoring and analysis by the training team will be performed, along with individual on the job coaching for implementation.

Food Footprint

One potential management strategy called the Ecological Food Footprint Analysis will be utilized to further develop local farm planning. The Food Footprint Analysis is a simple and effective tool that provides a relevant and clear representation of household food consumption. It is a simplified adaptation of the Ecological Footprint Analysis developed by Wackernagel and Reese and introduced in “*Our Ecological Footprint: Reducing Human Impact On the Earth.*” The Food Footprint quantifies the amount of land required to grow the main agricultural components of household food requirements. Land production rations (e.g. tonnes/ha) are defined for each crop and multiplied by annual consumption amounts (kg) to give the land requirements for each food component. The Food Footprint for each crop is then summed to give the total land area that is required to feed a household or an individual *sustainably*, meaning that the same plot of land must be available for production the following year for the same crop.

The Food Footprint is extremely effective in assessing household food security. In order to secure basic dietary requirements, households will first assess existing land usage, looking at the planted area and the associated agriculture returns. The Food Footprint can also be applied as a planning tool, encouraging farmers to reduce household Food Footprints while more efficiently managing farmland to produce higher and sustainable yields.

6.5 Farm Implementation

Farming families will put their farm plans into action under the guidance of farmer trainers, community organizers, village coordinators and REAP-Canada support staff. The communities will have the opportunity for continual training on sustainable farming. Sustainable farming techniques will be demonstrated on a field level by community members and project organizers through the development of “Learning Farms.” These will expose farmers to ecological practices that could be implemented on a larger scale throughout the community.

Learning farms will combine several approaches to introducing sustainable farming to communities:

- Adaptability trials (new varieties/crops, drought/water/salt resistant)
- Demonstration of (EFS) Ecological Farming Systems (contouring, composting, intercropping, multiple cropping, green manures, soil fertility management etc.)
- Soil and water conservation (windbreaks, checkdams, drip irrigation)
- Seed bank (living gene bank) and plant material multiplication (tree nursery)
- Breeding
- Appro-tech (farm equipment, on-farm energy management)
- Livestock (new varieties, sustainable fodder production)
- Weatherproofing farms (reducing vulnerability to vagaries of the weather)

These farms are coordinated by farmer trainers or other interested farmers that are willing to share their experiences and ideas with others. In this way, the farmer trainers can spend time working on maintaining and improving their own individual farms while strongly supporting community initiatives and the sharing of information and plant materials in the community. This also establishes a stronger connection between the test trials and the ecological trainings, and is ideal for farm visits and “out of class” field trips.

Learning farms can broaden development efforts by integrating several key ideas as techniques on one “regular” farm. They also avoid the concept of a terminal “Model Farm” with one model farmer, by placing the farmer and the farm at the center of learning in the community. Farmers feel the terminology “Learning Farm” is progressive as it does not create an image that a farm is “fully developed or perfect” or encourage arrogance in

farmers. Farmers want to put the emphasis on farmer trainers creating a small commercial farm that is sustainable without outside support so that the development process can be feasibly replicated by other farmers.

Activities at the learning farms will involve farmers developing tests and records of the new techniques and materials. Plant materials will be assessed by the farmers for various agronomic traits, performance and yield. Promising varieties will then be increased into larger field strips through the crop verification process. Trials testing new varieties of interest and confirming characteristics of varieties that demonstrated high adaptability to local conditions will also be undertaken. Other on farm testing of plants and livestock systems will also be developed based on priorities identified by the community through the PRA process. The overall goal is to encourage farmers to take a more active role in developing participatory on-farm research as a tool for accelerating their plant and farming systems improvement. Efforts will be made to further the local understanding of the links between the farmers and the environmental conditions through the farmer training program and field trials.

The learning approach encourages the exchange and progression of ideas and the constant observation and assessment by the farmer trainer and others in the community. This process is greatly stimulates brainstorming sessions which can occur when the community gets together at the farm or during cross site visits that occur when from farmer trainers and farmers come from other communities. Overall we believe this concept to be an important new orientation that is a logical evolution for the development of farmer-led ecological farming systems research and extension as it enables scarce resources for rural development to be used as effectively as possible.

As a summary, some of the initial ideas and potential demonstrations and projects to be included in the learning farms are as follows:

- New plant materials and plant material/seed propagation
- Drought resistant vegetables
- Water-conserving plants
- Drought tolerant tree species that improve ground water availability
- Drought resistant animal fodder such as sorghum sudan grass or millets
- Controlled grazing systems
- Improving soil fertility through green manures, improved crop rotations
- Reduced use of fertilizers by improving organic matter through minimal tillage, composting, growing crops with large root masses and crop residue utilization
- Multiple cropping systems
- Reduced use of pesticides, herbicides and fertilizers through weed, insect and disease control.
- Small scale soil and water conservation initiatives like windrows, mini-checkdams, permanent terracing, permanent pastures, cover cropping
- Salt-tolerant/ reducing plants into low-lying areas with high salt accumulation
- Management strategies for damaging pests
- Investigation of improved on-farm technologies such as threshing, weeding, hoeing, plowing and harvesting to reduce the work burden on women

To identify and establish local learning farms/gardens, the following steps will be followed:

- Assessment of best farms in region through farm visits and field trips

- Adaptability trials: small sites to test new/improved varieties/species that may be potentially successful. Emphasis on local farmer assessments (not scientific), both by leading farmers and under low-input management
- Scale up of those already deemed successful by NARI/ locals for distribution in local communities
- Prepare sites for planting (trees, seedbeds)
- Give local farmers that are already developing certain crops (like the fellows working on tomatoes, cassava) access to improved varieties and ask them to assess them

Intercropping

Monocropping provides an environment favourable to the growth of the extremely invasive striga weed, which attacks its host's roots stumping crop growth. Research undertaken by NARI shows promise for reduced striga populations through the practice of millet intercropping with groundnut, sesame and other crops, with an emphasis on those varieties that locals are interested in. Local trials will be conducted by the farmers and collectively monitored.

Vegetable and Grain Legume Diversification

Vegetable and grain legume diversification has the potential to significantly improve nutrition and diversify the landscape, with an emphasis on those varieties that locals are interested in. Alternative varieties of vegetable and grain legumes will be established including easy-to-grow crops and more difficult crops for farmers with more advanced farming skills. Seed conservation methods will also be demonstrated. As conventional vegetable production in the Gambia involves the intensive use of synthetic pesticides, biological pest control methods will be encouraged.

Improved cooking technologies

To alleviate the dependency on fuelwood, villagers will be exposed to alternative fuel stoves. These include evaluating the viability of the Mayon Turbo Stove and solar-powered cookers. Developed by REAP-Canada in the Philippines, the Mayon Turbo Stove allows for efficient combustion of rice hull and this can be supplemented with other local fuels such as corn cobs and peanut shells. Testing will be undertaken to determine if the stove can efficiently burn millet husk residues, which is a widely available crop residue.

Sustainable Soil Fertility Management

It appears that soil fertility conditions have seriously degraded in both communities due to intensive cropping of annual crops such as peanuts and millet. This is particularly the case for row crops, which can generate serious soil degradation problems. A number of new possible strategies will be introduced to work towards developing farming systems which maintain or build up soil fertility on the farms, these include:

- Reducing soil tillage: Where possible, reduce fall soil tillage. Minimum tillage systems should be tested and promoted to reduce soil erosion and the intensity of soil cultivation.
- Introducing drought tolerant grain legumes: Developing chickpeas, and higher water use efficiency field peas as new crops to expand crop rotations in the communities and enable a reduction in the acreage of annual row crops
- Introducing moderate to high yielding perennial forage crops on marginal lands to reduce cultivation of annual crops.
- Reduce the collection of field crop residues for livestock feeding and household energy use: Allow decomposition of residues in the field where possible to reduce soil erosion risks (by increasing residue cover) and for soil improvement.

- Composting: making compost from livestock manure and organic residues to help increase soil organic matter levels and increase soil biological activity. Turning manure into compost also helps facilitate application to more distant fields where manure is infrequently applied. These areas often have the most serious problems with declining soil organic matter levels.
- Introduce annual green manure crops periodically into the crop rotation, which help maintain soil organic matter levels and improve overall soil fertility.

Livestock Management

Especially in Lower Badibu District, the free-range system for livestock husbandry is one of the most significant impediments to the advancement of sustainable farming. A needs assessment and viability of a livestock management strategy will be discussed between the five selected villages in the Lower Badibu District. Understanding that this system has been practiced for generations and that farmers are generally concerned with the scarcity of fodder during the “hungry season,” considerable efforts will be made to identify the weaknesses of the current system and develop local solutions. Field trials will be conducted to assess the feasibility of using a semi-intensive livestock management plan where forage grasses and fodder trees will be cultivated in a rangeland environment. Live-fencing is proving effective against livestock infiltration in community gardens, and farmers will integrate this concept into the project to protect their communities.

Micro-financing

There is the potential for project sustainability through linking micro-finance with farmer-to-farmer training and the Agro-Ecological Village development. Limited funding is anticipated for micro-financing activities from the GAEV project due to existing credit unions and micro-finances structures local communities, project linkages to these local facilities would appear to be more appropriate and effective than establishing project based micro-financing. The most viable options for micro-finance will be surveyed and a plan developed with beneficiaries to link them with appropriate micro-financing to support the development of their farms.

Several schemes that could be adapted to the project at a later date include:

- Revolving funds that demand a significant community contribution to ensure the commitment for proper fund management from the beneficiaries.
- Communal farms in which the annual harvest is used to generate funds to top-up savings and provide loans.
- An incremental loan system to complement the increasing requirements for farm development as the project is implemented.
- In kind contributions and payback options for risky farmers with less developed financial management skills.

“Weatherproofing Farms” through Improving Water Conservation and Water Use Efficiency

Water management remains a critical issue in increasing farm production and in providing more stable crop yields in the communities. A number of strategies can be taken to improve plant soil water relations.

- Emphasize soil organic matter improvement, more water is held in soils with high soil organic matter content.
- Introduce more drought tolerant annual crops: Good possibilities for the communities are new annual crops and more water use efficient crops. These can be tested in community trial farms.
- Introduce grasses which are drought tolerant because of their high water efficiency and have deep root systems (2-3 metres deep) that can improve soil quality.
- Introduce drought resistant animal fodder such as sorghum sudan grass or millets

- Increase reliance on the use of biological N sources through expanded use of grain legumes, improved manure management systems and soil mineralization processes as chemical fertilizer tends to increase water stress problems for plants from the salts present in the fertilizer.
- Expand the use of trees in windbreaks to create a more favourable microenvironment for plant growth. Windbreaks reduce evaporation and can increase humidity levels. Fodder types of trees can be planted to also provide forage in dry periods for livestock. Species selected should improve ground water availability

6.6 Plant Material Improvement

Presently in the Gambia, NARI is responsible for plant material improvement programs. It faces several challenges in completing this task. The country's research and development budget is limited as it is a small nation. As such, it only has modest breeding programs for selected crops and relies heavily on plant introductions from outside the country. They also lack resources for exchange visits to other neighbouring countries to access important plant materials, limiting the quality and quantity of new improved varieties that can be accessed. NARI also lacks staff and resources to test improved strains at sites across the country. This is particularly true for areas on the north side of the Gambia River, as they are less accessible to researchers than the south side of the Gambia River. Many areas of the Gambia have extremely poor road infrastructure, resulting in long travel time and considerable efforts to reach rural areas. NARI's cooperation with NATC in this project provides an opportunity to further the development of participatory plant material improvement program in the north bank as a means to respond to the urgent need for improved materials in these difficult areas. This will be an excellent opportunity for NARI to identify beneficial indigenous nitrogen-fixing trees and shrubs, and investigate their multiplication at the local level.

VATG will assist in the development of plant materials in the CRD. As agreed with VATG management, NATC will liaise with NARI in the identification and collection of improved plant materials for distribution to farmers in CRD. NATC will provide technical support /on-the-job coaching for the beneficiary farmers in the area. VATG will meet the cost of required plant materials to be provided.

The plant materials the project is interested in developing include the following:

- Improved peanut
- Millet
- Rice (NERICA, upland and salt resistant)
- Sweet Potato
- Squash
- Cassava
- Eggplant
- Cowpeas
- Corn
- European Potato
- Vegetables (especially those that can tolerate the rainy season including Lomboy, Star apple, Juice Cashew, guava, plantain, banana, Citrus)

RICE improvement

NARI is a participant in the NERICA (NEw RICE for Africa) program which combines the use of African and Asian rice strains to create more drought tolerant strains of rice suitable for upland cultivation. This project provides an opportunity to upscale adaptability trials of improved NERICA strains and to upscale seed production.

Three hectares of improved rice strains will be upscaled in 2004 through this project. Adaptability trials will also be introduced in the AEV communities and on the individual farms of the farmer trainers to determine the suitability of these strains compared to present plant materials in use by communities in NBD and CRD.

Vegetable Improvement

In cooperation with NARI, new introductions of the principle vegetables grown in the Gambia will be accessed including common crops such as tomato, eggplant, pepper, cucumber, squash and sweet potato under ecological farming management. Efforts will be made to identify cultivars with pest resistance and drought tolerance as these are currently the major problems found in local vegetable production. The development of community seed banks and local seed distribution will be supported by the trials on the learning farms and community gardens, and the training of local farmers in seed conservation and plant material replication.

Agro-forestry

NATC has a strong interest and excellent experience in agro-forestry systems development. It produces 50,000 tree seedlings per year for sale and for students to use on their own farms. NARI is currently conducting a nationwide agro-forestry project. With the proposed development of Agro-Ecological Villages in NBD and CRD, agro-forestry trials can be included to assess promising species under different soils and management. NARI will be responsible for establishing parklands for multiple-purpose trees (MPTs) in the pilot sites. The parklands will primarily address the need or improvement of carrying capacity of the fragile legume/cereal production system in upland areas.

The project will enable an opportunity for NATC and VATG to expand their field experience in scaling-up the agro-forestry systems of local communities. The long-term goal is to develop agro-forestry systems like the Parkland Systems of agro-forestry initiated in Senegal, which involves appropriately spacing native trees to increase soil fertility and reduce wind and water erosion. As well, the trees can provide economic benefits such as fuelwood, fodder, building materials and food production.

Forage Improvement

It is evident that the free-range livestock system has been detrimental to Gambia's ability to advance in agriculture and there exists a great potential to switch to stored feed and managed pasture systems. The project partners will access improved germplasm of warm season grasses and legumes suitable for ecological forage production. Grasses to be tested will include improved selections of *Andropogon* sp., *panicum maximum* and *brachiaria* sp. and some have been identified to be efficient at Biological Nitrogen Fixation (BNF). REAP-Canada has over 12 years experience with warm-season grass production and breeding, and will be able to assist the partners and augment project development considerably in this area.

7. Project Management

7.1 Project Structure

The partner organizations, REAP-Canada, NATC, NARI, together with farmer trainers and representatives from the local VDC's will form the Project Management Committee (PMC), responsible for the overall direction and management of project responsibilities, research and field activities. At the outset of the project, a participatory action planning session will be held between the project partners to develop a detailed workplan for the activities/outputs for which they will be responsible. The workplans will identify milestones and expenditures associated with the completion of each activity. These workplans will be reviewed/monitored on a monthly basis

with corrective actions taken as required. NATC and NARI will meet bi-monthly to monitor the project's overall progress and conduct strategic planning. The REAP-Canada GEAD project manager will undertake recurrent visits to the project sites. Additionally, two CIDA-funded Canadian interns in the Gambia will provide project support and monitoring each year for the next two years. In addition to a project manager, the NATC project team will have two staff working at the field-level with farmer beneficiaries and one responsible for organizing farmer trainings. It is expected that the NATC team will have a strong (50%) representation of women.

7.2 Roles and Responsibilities of Project Proponents

Please refer to Appendix 1 for the Breakdown of the GAEV Project Partners Responsibilities

NATC has a strong record in project management and financial reporting to external donor agencies. It is familiar and capable of providing the necessary reporting (see Monitoring and Reporting below) as well as effective monitoring and facilitating of activities on the ground. Financial reporting with international donors has been handled proficiently, and funding for consecutive project implementation has been consistently approved allowing them to carry projects through full 3 to 5 year cycles. Ten staff members support Badarra Jobe, director at NATC, including a project manager, accountant, administrative assistant and a farm manager who supervises the activities of five farm workers. The Methodist Mission Agricultural Program provides extension support for NATC. NATC will facilitate the projects implementation at the farm level, while farmers will be empowered to be full participants in all aspects of the project. This will require NATC to appoint two persons to be the village-level animators who provide training to farmer trainers, facilitate project activities and remain aware of community concerns.

NARI, being a national government research and extension department, has extensive experience in project implementation, record keeping and financial reporting. NARI will include their experienced agronomists to work on plant material research and development, as well as personnel dedicated to the extension, training and community and capacity building efforts.

REAP-Canada will be helping provide the local partners with support in adapting the AEV model to the Gambia and providing research technical support around farmer training and farm diversification and ecologization. REAP will also support NATC and NARI in developing participatory plant material improvement in communities. As well, REAP-Canada will take the lead and responsibility on the annual reporting to CIDA, drawing on southern partners quarterly reporting, monthly updates, visits, and frequent communication that will take place between project partners. The management of this project will be facilitated through the high level of mutual trust and communication between the partners.

7.3 Role/Responsibilities of Project Beneficiaries

In each component of the project, beneficiaries will be engaged at the visioning and planning level to ensure the relevance of project activities and the likelihood of local acceptance. Local participation has been sought from the beginning through meetings during the exploratory phase and Focus Group Discussions conducted at village level in December 2003 outlining the communities' history, problems, interests, goals and objectives and identifying interest and viable approaches for a future project. Through a PRA process to be conducted during the first phase of this project, farm families will actively be involved in determining the major setbacks for development in the communities, identifying the causes and creating solutions and project action plans to drive these solutions, as well as indicators for success. The communities and local extension workers will also be responsible for

establishing a participatory monitoring and evaluation programs for the project. The beneficiary communities will provide input on specific areas of interest in which the project will develop including diversified farm plans, including choosing and assessing crop diversification alternatives and farm and energy-related appropriate technologies. Select farmers will also be involved in developing the learning farms to test sustainable agriculture methods and seeds. Farmer trainers will be drawn upon to mentor less-experienced farmers and “second-liner” trainers. Through participatory rural appraisal, farm families will be called upon extensively to provide project feedback and help direct future programming. Farmers will be both involved in receiving and providing training on ecological farming and upgrading their training skills to provide trainings.

The investment in strengthening the farmers’ institutions and bottom up training programs will continue development in communities beyond the project’s lifespan. Project activities can continue to be led by progressive local leaders with minimal need for human or financial inputs from outside the community. Empowering and training farmers generates a high capacity to continue local development and the increase in farm income will allow farmers more freedom to advance newly identified opportunities. The emphasis on sustainable farming systems and training and development will also ensure the long term maintenance and improvement of the agro-ecosystems from which the rural communities economies can continue to evolve.

7.4 Development of Project Proponents

NATC will be strengthened as it gains further skills in farmer training, organizational capacity building, and more on the ground experience in the process of bottom-up community development. As well, the project will enable NATC staff to gain experience in understanding ecological farming systems, the Agro-Ecological Village concept, and they will be able to continue to develop their capacity to improve farming systems research and training in the future. The project will create new linkages between NATC and NATC-graduates as the young farmers return to their farms and become the next generation of leaders in their communities.

NARI will improve the effectiveness of its outreach efforts in plant material improvement in rural communities through the development of participatory on-farm research and training. NARI will improve its ability to develop local breeding and plant material propagation systems and in an ecological and locally supported manner. It will also increase its current base in plant material base through increased access to other neighbouring countries and countries with similar climatic conditions.

REAP-Canada will gain further experience and understanding of ecological farming systems, plant materials improvement and the implementation of the AEV model in the Gambia, which it can apply to future research and development projects both in the Gambia, in Canada and internationally. Additionally, it will gain invaluable experience in learning how to overcome the social and technical barriers that will arise during the project implementation, which will increase its capacity in programming in West Africa and ability to aid rural communities in sustainable ecological and agricultural development.

7.5 Resource Requirements

Personnel

Project staff

Gambian Project Coordinator - Mr. Badarra Jobe, Director, NATC.

Shall be responsible of coordinating staff to implement field level activities, conducting field monitoring and evaluation, act as the link between project field officers, relevant NATC staff who may have a role in the project activities and REAP staff, and will network with other like-minded groups who can further the projects goals and objectives.

Gambian Project Manager - Mr. Sutay Nike, NATC

Shall be responsible of the overall management of the project, resource mobilisation, coordination of field level activities and facilitate the process of progress reporting. He will work with the Gambian project coordinator in the data consolidation in the Gambia for submission to REAP-Canada. He will be responsible to ensuring the smooth implementation of programmes/ activities in line with the plans and budget allocations as per budget line. As the manager of the project, he will be responsible for the on the job coaching of staff with a view to maintaining efficiency in their performance. The manager will maintain a close link with NARI for the timely implementation of planned activities.

Project Monitoring & Evaluation Officer –PM&E (Mariama / Kelly Tabureh)

Shall be responsible for the development of the PM&E framework and all monitoring and evaluation activities of the project. Responsible for the compilation of field workers monthly reports. The PM&E Officer will work with the project manager and the project coordinator in developing reports for submission the REAP Canada.

Gambian Community Organizers (2) – Mr. Adama Sala & Mrs. Mariama Ceesay

Based in their respective local community, will be responsible for facilitating organizational strengthening activities, project analysis, the necessary social activities to prepare for technical training and the training activities. Also responsible for coordinating activities with local project officer, including monitoring field implementation activities and trainings.

Project Accountant – Marley Jallow

Shall be responsible for the monitoring and consolidation of Southern Partners expenses, and the development of a financial plan for the anticipated flow of expenses during the year.

NARI Agroforestry Program Leader/Focal Point (coordinator)– Ansumana O. Jarju

Shall be the focal point representing the Director of NARI. He will be responsible for the coordination of all NARI activities and or responsibilities as contained in both the partnership agreement and the activity schedule. He will consult with all the relevant Program leaders at NARI and coordinate the implementation of all the required research activities at the project site. He will maintain a close link with the project management at NATC to keep tract of progress.

VATG Project leader/ Focal Point – Mr Dawda Kebbeh

Mr Kebbeh is the country Programme Manager for VATG and shall be the focal point for the present and future partnership with VATG. He will be responsible for the coordination of VATG's activities in the collaborative training and plant material improvement programs.

Canadian Project Manager – Claudia Ho Lem, REAP Canada

Responsible for overall written and financial reporting of the project to CIDA. Will oversee project management and implementation. Also responsible for facilitating the appropriate arrangements for the roles and responsibilities of the Canadian partner as described in this project.

Canadian Agronomist – Roger Samson, Executive Director, REAP Canada

Responsible for technical agronomical guidance and for co-facilitating the appropriate arrangements for the roles and responsibilities of the Canadian partner as described in this project.

Canadian Project Officer Labib El-Ali, REAP Canada

Provide support role to PMC in administering REAP's roles and responsibilities to the project. Shall be directly involved in coordinating with project partners, in regards to meeting financial guidelines, trainings, narrative reporting requirements and project monitoring and evaluation.

Training Staff

External Farmer trainers / advisors

Expert team from NARI enlisted to train the first and second liners in the farmer-to-farmer training program. In the event that there are no experts available on certain training topics within NATC / GEAD outside consultants will be hired to fill that gap.

Farmer trainers

Local farmers selected and trained to deliver project trainings to community on sustainable agricultural techniques including soil and water conservation, re-vegetation, and diversified farming. Farmer trainers will include both experienced farmer trainers (first liners) and farmer trainers in training (second liners).

7.6 Project Management and Implementation Structure

Project Steering Committee (PSC)

The PSC shall include the Canadian partners, NARI, VATG and NATC. The committee shall be responsible for the overall supervision and coordination of the project implementation, field operations, and finances. They are also responsible for the joint project review, assessment and planning, and direction setting and policymaking.

Project Management Committee (PMC)

The PMC will be responsible for local implementation of the project at the county/township level. The PMC will be headed by the local project implementing partners from NATC, NARI, REAP (including interns) and the local VDC's. The PMC will also include a local finance officer, community organizers and farmer trainers.

Project Implementing Team (PIT)

The Project Implementing Team (PIT) is composed primarily of local community organizers, village group leaders, farmer trainers and farmers, local government extension personnel, and other technical persons from NARI and elsewhere. The PIT shall facilitate project organizing and implementing, coordinating and conducting technical trainings and on-the-job training/coaching, be involved in the field implementation and on farm research and provide a link between the community and the PMC. They shall be involved in recording the technical trainings (topics, locations, participation, women) and other community activities such as the development of field-level implementation. They will also provide feedback and reports during the project assessment and planning sessions on the status of their work to the local project coordinator and PMC.

Project Technical Team (PTT)

The Project Technical Team (PTT) is composed of local farmers leaders, farmer trainers, local government extension personnel, other technical persons and farmers from the farmer technical groups. The PTT shall be

responsible for assisting and conducting technical trainings and on-the-job training/coaching, and be involved in the field implementation and technical aspects of on farm research. They will also provide feedback and reports during the project assessment and planning sessions on the status of their work to the PMT.

Farmers Associations (FA)

Two Local Community Based Organizations (CBO’s) known as Farmers Associations (FA’s) have been established, one in each community. They are responsible for community resource mobilization and managing the distribution of inputs/implements from the project to Farmer Trainers and other local farmers.

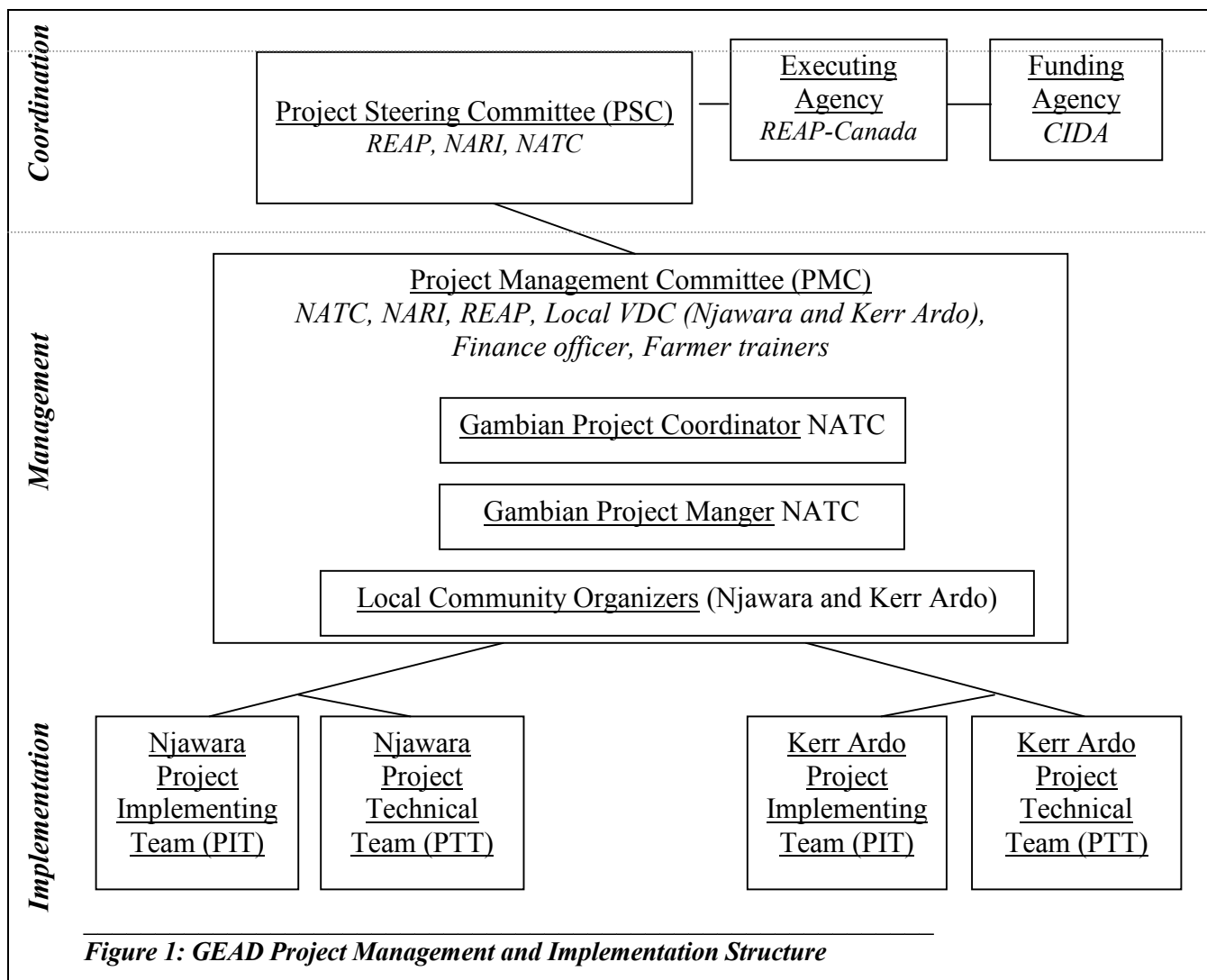


Figure 1: GEAD Project Management and Implementation Structure

Table 5: Official GAEV Project Management and Implementation Team Members

Team or Committee	GEAD Project Official Team Members

Project Steering Committee	Mr. Roger Samson Miss. Claudia Ho Lem Mr. Badarra Jobe Mr Sutay Njie Mr. Ansumana Jarju Mr. Dawda Kebbeh	
Project Management Team	Mr. Roger Samson Miss. Claudia Ho Lem Mr. Labib El-Ali Njawara VDC Kerr Ardo VDC Farmer Trainers	Mr. Badarra Jobe Mr Sutay Njie Mr. Ansumana Jarju Mrs. Kelly Tabureh Mr. Adama Sala Mrs. Mariama Ceesay Marley Jallow
Team or Committee	Njawara Official Team Members	Kerr Ardo Official Team Members
Community Organizers	Mrs. Mariama Sise Kebbeh	Mr. Adama Sala
Project Implementing Team (PIT)	Mrs Mariama Sise Kebbeh Njawara Village Group Leader Government Personnel NARI Technical Staff Farmer Trainers	Mr. Adama Sallah Kerr Ardo Village Group Leader Government Personnel NARI Technical Staff Farmer Trainers
PTT and Farmer Trainers	Ami Panney Rahey Dem Mary Jobe Ami Sanney Mam Tuti Sar Samba Jallow Jim Tourey Yero Jallow Mbye Dranneh Yahya Sowe	Pa Touray Yusufa Touray Ali Faye Saderr Jallow Bekai Keita Gabudeh Sowe Jai Sise Kala Drammeh Isatou Touray Sohna Sise

7.7 Inter-partner Reporting

NATC will take the lead in ensuring there is adequate reporting from all of the implementing partners in the Gambia. The project partners will exchange monthly updates outlining the status of the project programming and work plans, and quarterly reports outlining in detail the status of the project. This will include reviewing the status of the project activities, concerns, outputs and performance indicators. Project staff will contact one another immediately if challenges arise or irregularities occur. Please refer to Table 5.

Table 6: GEAD Required Reporting Periods 2004-2005		
Report Date Due to REAP-Canada	Content	Project Period Covered
June 30, 2004	Semi-annual Progress and Financial Report	Jan 15 - Jun 15, 2004

Nov 15, 2004	Quarterly Financial Report	Jun 15 – Oct 31, 2004
Jan 31, 2005	Year-end Final Project Activity and Financial Report	Oct 31, 2004 – Jan 15, 2005

7.8 Financial Management

REAP-Canada will be responsible for the overall financial report consolidation for submission to CIDA. NATC will be responsible for the financial reporting and consolidation of Gambian expenditures. All implementing partners will be responsible for the documentation of finances, bookkeeping and accounting of their budget allocation. The project partners will work together to develop quarterly financial forecasts. At the outset of each year, a financial plan will be presented at the joint planning meeting to enable all project partners to understand the anticipated flow of expenses for the year. Quarterly financial and semi-annual written reports will be prepared to track project progress.

8. Monitoring and Reporting

Following the completion of the PRA and the establishment of a community monitoring structure, program officers and extension support workers will be responsible for reporting issues encountered at community level to their respective organizations and the overall project administrators supported by NATC on a monthly basis. This will feed into the monthly updates that will take place between the southern partners and REAP-Canada, which will be used to track immediate progress and any issues that may arise to ensure effective and timely management. Southern partners will also report quarterly to REAP-Canada, indicating an analysis of the quarterly activities and outcomes, including individual financial reports. REAP-Canada will be responsible for the annual reporting to CIDA, based on the field visits, monthly updates, quarterly reports, and frequent communication that will take place between project partners.

Careful monitoring of performance indicators will be essential to the success of the Agro-Ecological Village development programming. For this portion of the project, performance will be measured through data collection from 20 families in the Lower Badibu communities. These families will be recruited during the community-organizing phase of the project, and will be relied upon throughout the course of farm development to provide baseline measures and indicate project performance through a Participatory Rural Appraisal process. Efforts will be made to ensure that these families are representative of the larger group of beneficiaries in terms of socio-economic status, household size, education level, farming experience and land ownership. Information contributed from these families will indicate the degree of project success while providing feedback through which programming can be improved. The socio-economic and agricultural indicators will be finalized by the community and the PMC.

An Agro-ecological survey will be performed on these families to assess the local farming practices in communities to evaluate their ecological impacts. The results of this assessment will be analyzed and formally reported, and incorporated into the development of the community. The Agro-ecological data will continue to be surveyed. The most relevant Agro-ecological indicators have been incorporated into the socio-economic survey to be monitored annually include:

- *Land use*
- *Crop, vegetable, fruit, livestock production*
- *Seed sourcing*

- *Composting, bio-residue utilization*
- *Farm records and planning*

Additionally, relevant Socio-economic indicators could be included in the survey, including:

- *Demographic characteristics*
- *Family Employment, Income and Expenditure*
- *Education*
- *Living Conditions*
- *Food and Nutrition, Food security*
- *Household responsibilities*
- *Priorities for future development*

Monitoring the progress of the project may also take the form of case study documentation of successful stories of farmers improving their farms and livelihoods.

Participatory Monitoring and Evaluation (PM&E) maintained by the community members or farmer trainers is also an integral part of Agro-Ecological Village development. A PM&E program can be continuously used to monitor important indicators, validate the action plan, assess the direction of the project, make management adjustments, elucidate procedures and ensure the ongoing capacity building of the community. In particular, it can also qualitatively measure environmental changes and perceptions more rapidly than scientific data or government surveys. The project team will investigate the appropriateness of this tool to agricultural development in the beneficiary communities. A PM&E program will also be implemented by the farmers to monitor the development on the learning farms by having them develop their own criteria for plant material adaptability and appropriateness to the local region.

9. Gender Equality and Gender Analysis

From the exploratory field mission it was evident that women in the Gambia in particular have very difficult lives and are in tremendous need of support programs. Women are in charge of all household duties as well as the labour intensive task of growing supplementary food which includes the cultivation of most of the fruits and vegetables consumed by the family over the entire year. Women have little access to cash as it is the man's responsibility to grow the family cash crops and collect the revenues. Women often have to get loans from their husbands to purchase seeds for the food crops they grow or ordinary household goods. During the dry/fallow season, men's work does not require them to spend nearly as much of the energy that women do during their day and are often found lounging beneath the baobab trees. Additionally, women are also often forced into socially difficult arrangements through the local custom of polygamy and male dominated traditions. This puts a strain on family relations and often increases household size dramatically. As a result of these limitations, women in the Gambia have very little decision making power and are often marginalized in their own homes and communities.

The advancement of ecological agriculture is of paramount importance to improving their quality of life and restoring the natural resource base of their environment. The transition of the targeted communities to Agro-Ecological Villages has great potential to improve the quality of life of women, men and their families. Efforts will be made to facilitate both male and female participation in the committee of elected officials and in all decisions regarding farm transformations. Through the programming of the project, both men and women will be highly engaged in the Participatory Rural Appraisal process, contributing data through which the project can

be evaluated and strengthened. A target of 25% female participation in all project activities has been set, including the participation in farmer-to-farmer training sessions and selected as farmer trainers. The project will endeavour to encourage the participation of both men and women to ensure they gain more control over their family and individual well-being.

10. Environmental Assessment

The environmental risk of this project is limited as its main emphasis is on the introduction of more ecological farming practices and farmer training. Instead, the project has the potential to benefit the local and global environment in several important ways:

- Decreased soil erosion due to wind and water through the implementation of sustainable agro-forestry techniques and other ecological farming practices
- Increased soil nutrient cycling and soil quality through the practice of intercropping
- Restoration of local plant and animal biodiversity

11. Risks and Assumptions

Two main external factors were identified which could challenge the projects success: the erratic climate and potential socio-political instability. Rainfall has not been consistent for the past 15 years, and although the 2003 harvest was relatively good, the harvest in the future could experience severe drought. This risk is minimized by project activities that will introduce early maturing and more drought resistant varieties and crops to the region. As well, improved infrastructure for food storage is currently under construction in some beneficiary communities that will prevent damage of seeds and grain stocks when threatened by flooding or heavy rains. Secondly, although the current political situation in Gambia is very stable, political and social tensions in neighbouring countries could arise with the deteriorating economy and increasing conflicts in those countries. Farmers, however, do not have a history or deep involvement in cross-border political conflict. Efforts to diversify crop production, increase food security and reduce dependence on chemical inputs would make farm families less affected by a declining Dalasi or a growing economic or political crisis in the nation. Historically, farming families have tended to survive difficult political and economic periods more successfully than the urban poor.

Project implementation could be also compromised by a lack of coordination at the organizational or beneficiary level. The project addresses these concerns by focussing on action-based linkages that will support collaborating agencies implementing specific interventions together, sharing experiences and building relationships on the ground with the beneficiary communities. Both NGO's have a strong record in being effective organizations. The establishment of farmer-led organizations and activities at the community level also creates a project that reduces dependency on NGO intervention and organization and challenges and empowers beneficiaries to become more responsible for their own development process. Regular planning and feed backing sessions amongst the various players in the project will create an opportunity for addressing organizational concerns such as the need to redefine roles and responsibilities. Careful analysis during community selection has been made to choose communities with secure land tenures, a good history of internal organization and effective and trusting relationships with the local partners.

12. Public Engagement

Efforts will be made to ensure the public becomes aware of the AEV development approach, both nationally in the Gambia and internationally in other countries including Canada. In the Gambia this includes outreach to the local outlying communities, as well as furthering ties between other developmental and governmental organizations to improve their understanding of holistic agricultural programming.

Over the past four years REAP-Canada has participated in considerable public outreach, both within Canada and internationally. Public presentations, seminars and articles by the organization have exposed a wide audience to their programming. REAP-Canada's office location on the Macdonald campus of McGill University provides an ideal location to increase awareness of the project to the university community and to introduce students to the field of sustainable development. REAP-Canada regularly attends conferences in Canada where the results of the project can be shared. REAP-Canada will continue to relate its programming experiences to academic and public institutions and agricultural communities around the world.

13. AEV Sustainability

The long-term impact this project intends to make is to improve the lives of farmers living in environmentally degraded environments through the widespread adoption of sustainable agriculture techniques and other capacity building activities at the community level. The project envisions the successful implementation of a low-cost community development model that can easily be replicated in other areas of West Africa to reach the millions of peasant farmers who desire to improve their quality of life. The Agro-ecological Village Model has been implemented because it is locally adaptable and is based on the transfer of sustainable agriculture techniques to whole communities. As the benefits of sustainable community development are realized, the people will have greater household self-reliance through increased income and opportunities.

Over the long term, the project will result in an improved quality of life and a reduction in environmental degradation to the rural farmers targeted as the immediate beneficiaries. It will also develop their social and community networks, improving relations between government offices, technicians and farmers, and between men and women. It will improve the agronomic practices currently being used in remote rural areas and empower rural peasants to take a more active role in their development process through the PRA, farmer-to-farmer training and on-farm trials. The investment in strengthening the farmers' institutions and bottom up training programs are key features of the AEV that will help continue the development process in communities beyond the project's lifespan. The investment in empowering and training farmers generates a high capacity to continue local development. Increased farm income will allow farmers to reinvest capital into newly identified opportunities. The emphasis on ecological farming systems, environmental rehabilitation, and training and capacity enhancement will also ensure the long term protection and regeneration of the agro-ecosystems from which the rural communities economies can continue to evolve.

The Agro-ecological Village development model is distinctive in its ability to bridge the communication and information gap between the masses of peasant farmers, research institutes and the local government. Through its participatory approach and holistic design, it innovatively integrates environmental, agricultural, economic, social and gender development through capacity building, training, education and information exchange. It also demonstrates tangible development measures including farm planning, trial farms and seed distribution. It is a simple and effective model, proven both in the Philippines and in western China, and in almost any rural agrarian community setting. Its participatory methodology allows for high levels of beneficiary ownership, creating long lasting and sustainable results in the community.