# MALAWI

# Agricultural Research and Extension Pr

**Improving the Food Security of Farm Families in Malawi**

# Malawi Agricultural Research and Extension Project

## Final Report

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# A Cooperative Project of:

Malawi Ministry of Agriculture

United States Agency for International Development

Consortium for International Development

Oregon State University

Colorado State University

Tuskegee University

Washington State University

## Forward

# Malawi Agricultural Research and Extension Project

Agriculture continues to be the mainstay of the Malawi economy. It accounts for more than 33% of the gross domestic product, contributes over 80% to the foreign exchange earnings, and provides employment for a majority of the Malawian populace. Consequently, the Malawi Government has attached high priority to the development of the agricultural sector and to management of Malawi's fertile soils which permit the growth of many crops.

In its effort to develop the agricultural sector, the country has relied on both domestic and foreign resources. Financial assistance from foreign sources has come from both multilateral agencies like the World Bank, and friendly governments like the United States of America. The United States Agency for International Development (USAID) funded the Malawi Agricultural Research and Extension (MARE) Project. The fundamental objective of the project was to enhance the institutional capacity of the Ministry of Agriculture to increase the productivity of traditional crops and to diversify the agricultural production of the smallholder.

The MARE Project has trained a number of research scientists and extension officers in various agricultural disciplines. As an example of the impact of this well-trained cadre of personnel, Malawi has been able to develop high yielding hybrid maize varieties ( Malawi Hybrids 17 and 18) that have similar qualities to local maize. These varieties are easy to store and pound, and have been well received by the Malawi populace. Their use will greatly assist in realizing the country's objective of food self sufficiency.

Linkage between agricultural research, extension, and farmers is vital for technology dissemination and agricultural development. The MARE Project has gone a long way toward strengthening this linkage, which has lead to development of technical messages that are specific to various geographical areas. Agroforestry and horticultural activities have also been improved.

Another result of the MARE Project has been the increase in participation of women farmers in programmes in the Ministry of Agriculture. The MARE Project has also improved desktop publishing capabilities for the Headquarters of Extension Aids Branch and the Visual Aids Units in the Agricultural Development Divisions.

In short, improvements resulting from the MARE Project, namely training, research, and extension, have been realized. And the fruits have already begun to be enjoyed by the Malawian farmers and the nation.

**F. M. Kangaude, M.P.**
**DEPUTY MINISTER OF AGRICULTURE**

# Background

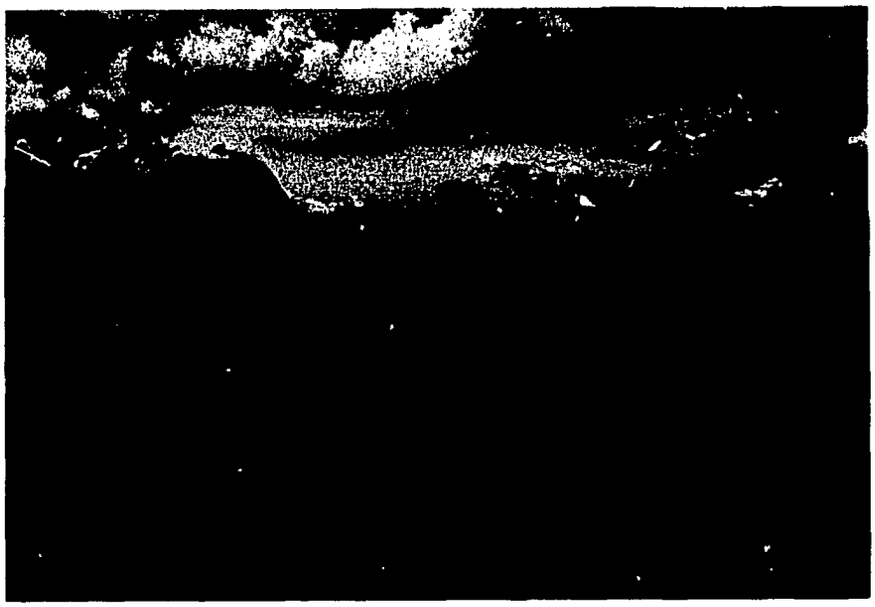
The Malawi Agricultural Research and Extension (MARE) Project was an institution-building project that assisted the Malawi Ministry of Agriculture in developing the nation's capacity to increase the productivity and well-being of farmers with small land holdings (smallholders). The Malawi Agricultural Research and Extension Project was a cooperative effort between the Malawian Government, the United States Agency for International Development (USAID) and the Consortium for International Development.

The project was funded by the Malawi Ministry of Agriculture and USAID with technical assistance provided by the Consortium for International Development, utilizing Oregon State University as the lead university. The MARE Project was a companion project to two complementary World Bank supported projects, representing cooperation among donor agencies.

The Government of Malawi is committed to make the most of its human, natural, and financial resources in order to support its more than seven million people. To promote this policy, the Government of Malawi designed the MARE Project to strengthen three areas to ensure food security among farm families. On the institutional level, the Department of Agricultural Research sought assistance in research management in order to efficiently integrate appropriate technology into prevailing farming systems. To improve the scientific expertise of Ministry professionals, the government sought training for Malawian researchers and extension staff both abroad and through on-site training in Malawi. The Department of Agricultural Extension and Training committed itself to improve communication abilities, to strengthen linkages between researchers and farmers, and to include the participation of women in all aspects of these endeavors.

## The Setting

Malaŵi is a long, narrow country which lies along the southern part of the East African Rift Valley. Malaŵi has distinct wet and dry seasons. During the wet season which extends from November to March, rainfall ranges according to location from 800 to 2500 mm. Crops are produced at elevations ranging from 40 to 1500 meters above sea level. Malaŵi has a wide range of soils and environments, resulting in the capability of growing a broad spectrum of tropical and sub-tropical crops. Smallholder farmers grow maize, rice, cassava, sweet potato, groundnuts, sorghum, coffee, fruits, nuts, and vegetables. They keep a variety of livestock including cattle, goats, sheep, and poultry. They have been limited by a lack of economically viable production strategies appropriate for small farms with limited resources, declining soil fertility, and a variety of pests and diseases.



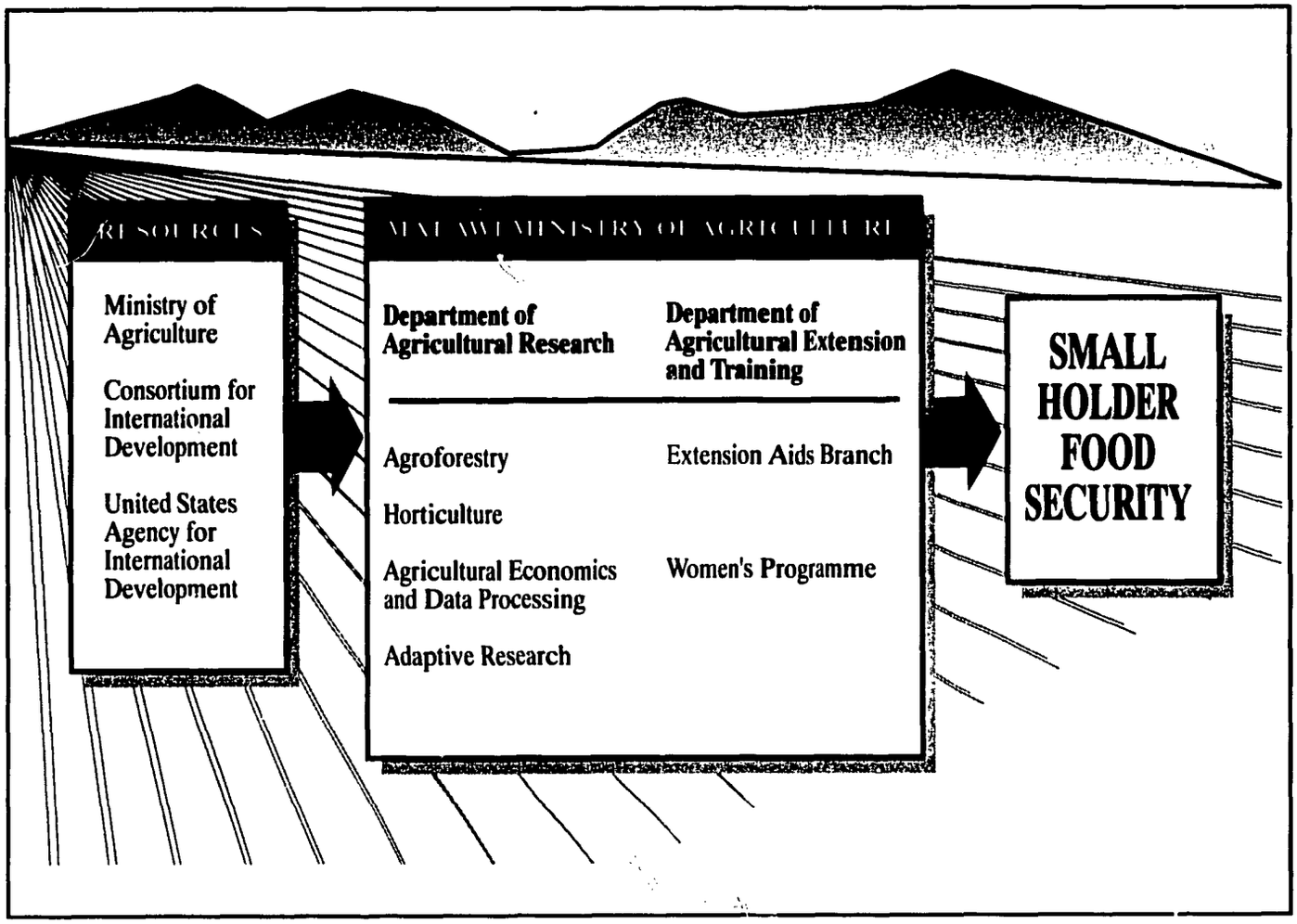
***Rural Malawian landscape.***

## The Project

The MARE Project is one of several major components of the National Rural Development Programme Phase V of the Malaŵi Ministry of Agriculture. It was designed by Malawian and USAID specialists to assist Malaŵi in achieving the goals of the Malaŵi Government's development policy. The six-year MARE Project (1986 - 1992) assisted in making sustainable institutional improvements in the Ministry of Agriculture through its support and strengthening of research and extension. The project personnel have been instrumental in developing technologies utilizing the existing structure of the Ministry of Agriculture's Department of Agricultural Research and Department of Agricultural Extension and Training. Ministry of Agriculture staff have had many opportunities for training, including short courses in Malaŵi and abroad. The increased number of staff with advanced degrees has improved the Ministry's research and extension capabilities for meeting the needs of limited resource farmers.

## The Components

The Consortium for International Development, a group of eleven western U.S. universities cooperating in the implementation of technical assistance projects, was selected to provide technical assistance in research and extension to the Malaŵi Agricultural Research and Extension Project. Oregon State University was designated as lead university for the purpose of managing the project. Colorado State University, Tuskegee University, and Washington State University played critical supporting roles in project implementation. Participating universities provided long- and short-term technical assistance, training, and advice on project implementation. The Consortium for International Development was responsible for managing USAID's financial contributions toward technical assistance which totalled approximately $8.2 million.


RESOURCES
Ministry of Agriculture
Consortium for International Development
United States Agency for International Development
MINISTRY OF AGRICULTURE
Department of Agricultural Research
Department of Agricultural Extension and Training
Agroforestry
Horticulture
Agricultural Economics and Data Processing
Adaptive Research
Extension Aids Branch
Women's Programme
SMALL HOLDER FOOD SECURITY

# Purpose

The purpose of the MARE Project was to assist the Ministry of Agriculture to improve its institutional capability to increase the productivity of traditional smallholder crops, and to identify the most viable crops for diversifying smallholder production. To accomplish this purpose, the project formulated the following objectives:

1. Assist the Department of Agricultural Research to review and update its organizational structure in order to focus research more sharply on the objectives and priorities of smallholders.

2. Advise the Department of Agricultural Research on the most efficient, cost effective and technically appropriate procedures for implementing a farming systems research and extension program.

3. Strengthen the applied research program in agroforestry and horticulture.

4. Strengthen the capability of the Agricultural Economics and Data Processing Unit to undertake analyses of technologies being researched, including analyses of the market potential of crops being tested.

5. Assist the Extension Aids Branch to strengthen its agricultural communication capacity, including the design, implementation, and evaluation of alternative mass communication methods.

6. Assist the Women's Programme Section to identify the agricultural production constraints of women farmers and develop strategies to address these constraints.

7. Develop and implement systematic procedures for on-the-job training of Malaŵian staff and provide educational opportunities abroad.

*Marketing of high value horticultural crops like tomatoes supplements farmer's income.*

# Approach

## Integrating Technical Assistance

The Malawi Agricultural Research and Extension Project has been recognized for its unique approach in managing institutional development for the benefit of smallholder farmers. Project design, contractor selection, and management of technical assistance personnel were the responsibility of the Malawi Ministry of Agriculture. The expatriate technical assistants were integrated directly into the Ministry. By working within the Ministry of Agriculture, as opposed to operating under a parallel, external administrative structure, Consortium for International Development personnel had more effective working partnerships with Malawian counterparts and staff.

***Mr. Dixon Banda inspecting bananas with the MARE Horticulturist, Dr. Bill Braunworth.***

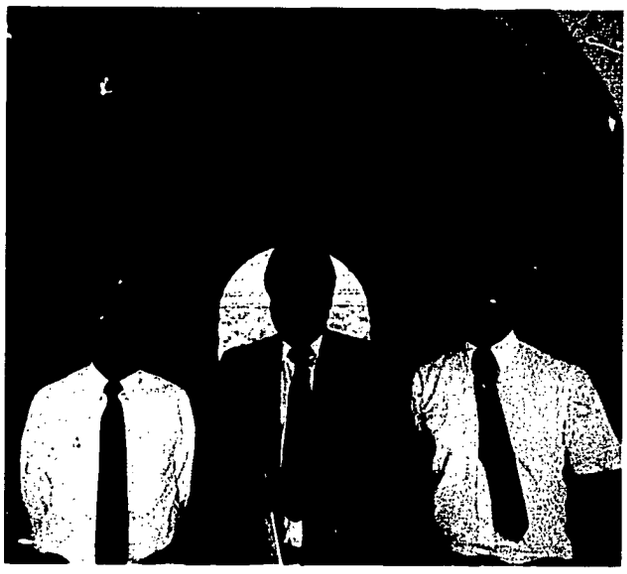
## Technical Assistance Management

### Recruitment and Assessment

Careful recruitment and assessment of MARE Project technical assistance personnel helped ensure the selection of highly qualified individuals. Malawian project managers were fully involved with decision making in this step of the process.

### Project Management

The MARE Project did not have an expatriate chief of party or team leader based in Malawi. Project coordination was the responsibility of a coordinator located at Oregon State University. The coordinator maintained regular communication with all project participants and made quarterly monitoring visits to Malawi. To maintain continuity, the same person remained in the project coordination role during the life of the project.



***Dr. John Byrne, President of Oregon State University, Dr. Godwin Mkamanga, Chief Agricultural Research Officer, and Dr. David Acker, MARE Project Coordinator (left to right).***

## Project Activities

### Institution-building

While serving in advisory or technical assistance roles, Consortium for International Development staff were involved with daily research and extension activities and decision making, working in cooperation with Ministry personnel. This association resulted in continuous, on-the-job training which served to strengthen the units' ability to manage their programs effectively. Long-term technical assistants were stationed with Malaŵian counterparts who had responsibility for the Ministry units. They developed unit plans together and reported to the same supervisor. Together they incorporated new approaches and directions for the units.

### Training

During the course of the project, more than 2,400 Malaŵian professionals were trained in Malaŵi, 57 additional people took part in short-term offshore training courses and 48 Malaŵians studied overseas and obtained advanced degrees.

### Linkages Between Research and Extension

Close coordination between research and extension helps to ensure that research is relevant to smallholder farmers. Two-way communication was promoted among researchers, extension workers and farmers in order to identify and respond to smallholder needs.

### Access to Global Technology Networks

Malaŵian scientists benefitted from ready access to world-wide library sources through local collections and were supported by document delivery services from Oregon State University. Also, frequent visits from short-term specialists from Consortium for International Development universities provided additional opportunities for technical advice and support.

*Mr. Mvula, Mr. Lumbe and Mrs. Mhango examine tomato plants in a trial at the Bvumbwe Agricultural Research Station.*

*Mr. C.T. Chizala, Tropical Fruits Team Leader, and technical assistants assess a farmer's banana crop and provide production advice.*

*Mrs. Catherine Chibwana, Head, Women's Programme Section*

# Accomplishments and Impact

## Agroforestry - Research Program Highlights

After six years of work, agroforestry research activities have had a significant impact on the Ministry of Agriculture's ability to develop and deliver relevant agroforestry technologies which promote environmentally sound and sustainable farming practices. The strategy of the research program began with preliminary field work with farmers to identify their needs, then focussed on testing and recommending a broad range of suitable agroforestry species. Recommendations for several key agroforestry technologies have been published in a new chapter in the Guide to Agricultural Production in Malawi for 1992 - 1993. Technologies continue to be evaluated on farms in various ecological zones of the country. Highlights of the agroforestry research are described below.

The MARE Project research showed that maize yields are significantly higher when grown under *Acacia albida* trees and has promoted the **systematic planting of *Acacia* trees** in agricultural fields. This is a practical, environmentally sound, and sustainable technology that reduces farmers' need for costly fertilizer. In addition, these trees can produce 100 kg of pods per hectare which provide high quality fodder to livestock during the dry season when forage is severely limited.

**Alley cropping** is the practice of growing a legume hedge between the rows of an annual crop such as maize. The plant material from the pruned hedge is used as a mulch and a source of enrichment for the soil's fertility, reducing the need for expensive inorganic fertilizers. This practice has resulted in a yield of maize two to three times the yield of maize grown without an alley crop or chemical fertilizer. Alley cropping recommendations have been developed which include selection of species for different ecological zones, nursery production techniques, cultural practices, and supplemental fertilizer application guidelines.

Small plots of *Leucaena* grown in pure stands or intercropped with alleys of napier grass, known as **fodder banks**, are recommended for high yields of nutrient-rich foliage and seed pods that are used for supplemental livestock feed. Spacing and pruning practices for optimum fodder and fuelwood yields have been determined through research. These practices are being adopted by increasing numbers of farmers in various livestock enterprises.

***Maize planted near** Acacia albida **tree.***

**Contour strips of vetiver or napier grass**, planted with suitable hedges of leguminous shrubs and fruit trees, showed promise for reducing soil erosion, deforestation, and surface water runoff on steep slopes. These strips also provide other products, such as mulching material, thatching grass, fuelwood, fodder, and fruit.

*Contour strips using local Hyparrhenia grass*

**Live fencing** involves planting suitable species around vegetable gardens, field crops, or tree seedlings, in order to protect them from untended livestock. Farmers presently use sisal but they are interested in other species with multiple uses. The Agroforestry Team has evaluated and recommended several species for live fencing in several ecological zones.

*Maize and Leucaena alley cropping*

## *FAMILY LEVEL IMPACT*

***The Kahunde family operates a small farm in the Dedza area of Ntcheu. The Kahunde family customarily bought and used fertilizer for their maize production. In 1987, when approached by agroforestry extension staff associated with the MARE Project, they planted Leucaena between the rows of maize using nursery seedlings provided by the project. This practice is called alley cropping, and is now being adopted in Malawi as one strategy to reduce the use of inorganic fertilizer. The pruned material from the Leucaena hedge acts as both a mulch and a source of soil fertility. This is important because fertilizer is a relatively large expense for Malawian smallholder farmers. During the first two seasons while the Leucaena was becoming established no yield differences were noted. During the following seasons the maize in the alley cropping regime produced yields that were generally higher than the maize fertilized with inorganic fertilizers. The Kahunde family was convinced of the benefits of alley cropping and plans on expanding the area planted with Leucaena. They say they have already saved money by buying less fertilizer and have maintained good maize yields.***

# Accomplishments and Impact

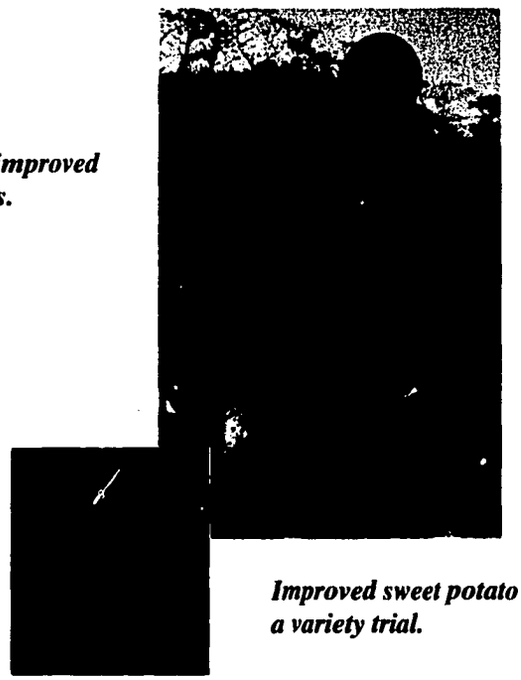
## Horticulture - Research Program Highlights

The Horticulture Research Programme developed a closer linkage with extension and the smallholder farmer through the use of surveys, on-farm technology verification trials, and training programs for extension staff and farmers. These closer ties helped the Ministry set research priorities that reflect the needs of smallholder farmers and make the best use of the relatively limited resources for research. Training materials such as a crop production handbook, videos, and slide sets have been developed. During the course of the project the horticulture staff improved their skills in design and management of experiments, and in using computers for data analysis.

**On-farm trials** and demonstration plots were incorporated in all horticultural commodity research programs and emphasized technologies that are both effective and available to the smallholder. Adaptive research trials and demonstrations of recommended varieties of cabbage, tomato, banana, peach, apple, citrus and mango have been expanded to include extension training centers and farmers' fields, and are an important teaching aid.

**Intercropping trials** of cassava with maize and **sweet potatoes** with maize resulted in cropping recommendations for the smallholder that promote food security in the face of drought. In the recent drought (1991/92) the importance of cassava and sweet potatoes was recognized nationally, and the researchers' recommendations played a critical role in national food security. Intercropping trials of maize and beans with **coffee** were also conducted to refine methods of intercropping according to the farmers' goals and their environment.

The MARE Project published a comprehensive **guide to production practices** for horticulture crops. Additionally, recommendations for most crops have been distributed as handouts and have been incorporated into the nationally distributed Guide to Agricultural Production.



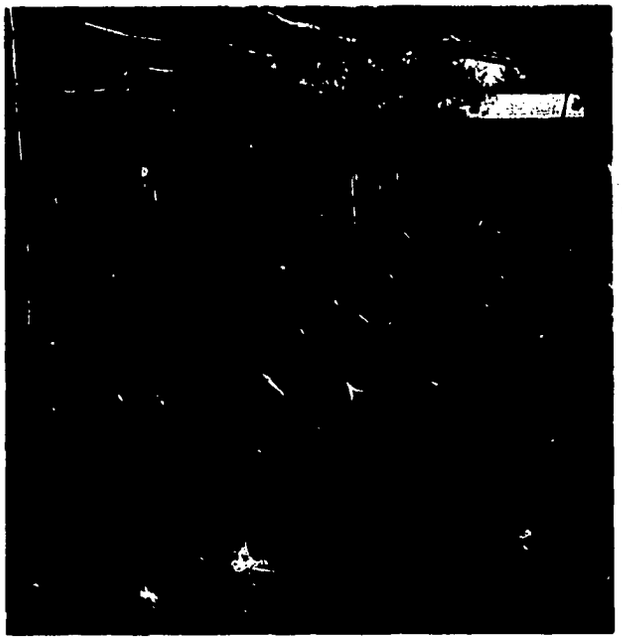
*Mr. Bakali inspects improved sweet potato varieties.*

*Improved sweet potato line in a variety trial.*

*Coffee berries prior to harvest in a maize and coffee intercropping trial.*

An additional benefit of the MARE Project was the improvement of **data management skills with the use of computers** at the professional and technical staff levels. This included improvements in data collection, management, statistical analysis, reporting, and presentation of research results, which contribute to improved quality of research in the Horticulture Research Programme.

**Plant materials conservation** programs were implemented for evaluation and release of varieties of bananas that are resistant to Black Leaf Streak and Panama Disease, two serious disease problems in Malawi. Disease-free orchards of citrus have been established to provide a source of plant material for further propagation and distribution to farmers. An international collection of cassava varieties is being propagated by a tissue culture facility. A vegetable seed production project is providing farmers with seed of several commonly used, highly nutritious indigenous vegetables. A large-scale food security program distributes improved varieties of cassava and sweet potato seed to farmers. These activities are noteworthy given recent drought conditions and the importance of these crops for consistant yield despite the drought.



***Cashew nursery.***

## *FAMILY LEVEL IMPACT*

***Farmer transporting bananas from field to market.***

***Mr. and Mrs. Thupwela are leaders in the Thekerani community. They have been growing bananas for sale in Blantyre for many years. They have used traditional cultivars and practices for spacing, planting and management of bananas. The Horticulture Research Programme at Bvumbwe Agricultural Research Station developed cultural production recommendations for improved cultivars of bananas. Research staff introduced these varieties and the associated methods of cultivation to the Thupwelas. The introduction included training them to recognize and prepare the correct banana suckers to be used for planting. Proper planting resulted in earlier fruiting and reducing the infection of nematodes in the root system. The mulching methods used now preserve soil moisture and improve soil fertility. The Thupwelas are producing higher yields of better quality fruit and have increased family income. This is an important demonstration because they are setting an example that is being emulated by their neighbors.***

# Accomplishments and Impact

## Agricultural Economics - Research Program Highlights

The agricultural economics capability of the Ministry of Agriculture resides in the Agricultural Economics and Data Processing Unit (AGREDAT). This unit has improved the Ministry's capacity to study marketability and profitability of specific crops and the economic viability of production recommendations. AGREDAT accomplished this by conducting socioeconomic studies which identified limitations to increased production and profitability. Project staff have analyzed market potential and promoted the development of various agricultural commodities, including groundnuts, poultry, cotton, cassava, sunflowers and soyabeans. The feasibility of adopting new technologies, and the associated constraints on farmers, were also studied. Workshops on economic analysis were conducted for crop and livestock researchers.

The MARE Project has helped establish **training and structural reorganization** in AGREDAT so that Malawian economists are now able to more effectively perform economic planning and analysis for agricultural research scientists. Economists now work collaboratively with commodity scientists on research stations and farms, as well as with extension units and agricultural development policy makers.

The development of the structure, mechanism, and subject material for a **formal training capacity** within AGREDAT made a significant contribution to the recent increase in the extent and diversity of economic analysis of research trials. An economics methodology and data collection manual suitable for the Malawian context was prepared and is now used routinely in research programs.

Ongoing **evaluations of research programs** have produced the following results: selection of an alternative cotton insecticide for distribution to farmers, expanded research into cotton fertilizers, the redesign of on-farm dairy trials, the acceptance of soybeans and investment in soyabean extrusion facilities, and an adjustment to the national producer price system for sunflowers that resulted in large production and income increases for smallholders.

***Promotion of diversification of crops such as sunflower was an important objective of the project.***

***Improved research management involved the flow of information among key decision makers.***

Through the efforts of the Ministry of Agriculture to improve research management they developed methodologies for establishment of research priorities. This has resulted in improved coordination between researchers and extensionists. A **five-year staffing and financial plan** created during this project is being used to guide management decisions. Improved **project management** procedures have directly resulted in the renewal of a large World Bank-supported research project.

***Improved cotton production resulted from integrated pest management research.***

***Woman with pest and disease-free cassava planting materials***

## *FAMILY LEVEL IMPACT*

***Farmers in Salima started growing cassava as a complementary crop to maize to improve their food security, but the cassava mealy bug and cassava mosaic virus reduced their harvest. The AGREDAT and the Root and Tuber Commodity research staffs identified simple innovations to help farmers increase production and reduce losses of cassava. Salima farmers adopted the new crop technologies when they saw, demonstrated in their own fields, the increased yields resulting from using healthy cassava stock for planting. The farmers now have fewer problems with cassava mealy bug and virus, and are pleased with the increased production and consistent yield of cassava under drought conditions.***

# Accomplishments and Impact

## Adaptive Research Unit-Research Program Highlights

*Agricultural researchers interviewed farmers to learn about their production constraints.*

The Adaptive Research Programme was originally designed to promote better linkages among agricultural researchers, extension personnel, and farmers. It was organized to ensure the flow of information to all participants in the technology development, dissemination and utilization process. Specifically, surveys were carried out to determine the needs and concerns of the farmers. The Adaptive Research Programme ensured that trials by research scientists would be more relevant to farmers. This was accomplished through farmer participation in trials and in assisting scientists in selection of treatments, location, and other factors affecting applicability and adoptability of research results.

The Adaptive Research Programme coordinated on-farm trials that refined new technologies and conducted social science studies to determine the appropriateness of new technologies for the smallholder farmer. The project provided training to Malaŵi staff in on-farm experimental design, computer analysis of trials, and administrative tools such as budgeting and human resource planning. However, as the project evolved, the adaptive research function became more highly integrated within each of the commodity research teams, which lessened the need for a stand-alone Adaptive Research Programme.

*Careful field work and collaboration between extension and adaptive research staff resulted in the promotion of relevant technologies.*

## *FAMILY LEVEL IMPACT*

***Mr. Sandu, a groundnut farmer from the Lilongwe Agricultural Development Division, applied a fungicide for several years as required by the extension service for all seed producers. He and his neighbors questioned the recommendation, but always spent the money for the mandatory treatment. Research, originally completed by the Agricultural Economics and Data Processing Unit, showed, in both on-station and on-farm trials, that this treatment was not cost effective for production of groundnut seed. The impact of this adaptive research effort by the MARE Project staff led to the abandonment of this unprofitable treatment. Now Mr. Sandu and his neighbors are no longer required to use this fungicide and they instead use the money for other family needs.***

***Other smallholder neighbors such as the Lande family showed an eagerness to investigate various groundnut production problems. With support from the MARE Project these farmers form a key, self-sustaining component in the technology development process: farmer experimenters.***

***Farmers measure yield of groundnuts produced in on-farm trials.***

# Accomplishments and Impact

## Women's Programme - Extension Program Highlights

The MARE Project assisted the Ministry of Agriculture in helping women farmers overcome technical production, institutional, and social constraints and to ensure that issues and needs of women farmers are included in research programs. The project provided funds to assist women's groups in starting agricultural income generating projects. Farm home extension agents were trained in agricultural production technologies, and male agricultural extension agents were trained to work with women's groups. The project also assisted in planning and development of extension material appropriate for women's groups.

*A women's club gathers for a training session conducted in their village.*

Through the MARE Project the Ministry of Agriculture developed the structure and policy of the Department of Agricultural Extension and Training for **delivery of services to women**. This has included training, access to credit, and support for the establishment of income generating activities.

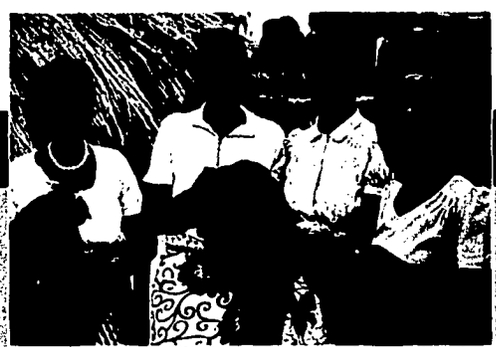
The development of a database of gender specific statistics led to an increased awareness of women's roles in agricultural production and to a more appropriate allocation of resources. This information is used by the Ministry for planning and policy making.

*Groups of women farmers cultivate and market crops to earn additional income.*

**Development of training programs for women** led to an increased awareness at all levels of government of the importance of women in agricultural production. The opportunities provided by this training have expanded women's access to technology in the agricultural sector.

As a result of this emphasis on women's concerns, **income generating activity groups** have formed and become the initiators of cooperation in communities with visible accomplishments such as increased family incomes. These projects have included the use of credit for activities such as dairy, poultry and groundnut production.

## FAMILY LEVEL IMPACT



***Women farmers raise poultry for meat and eggs as an income generating activity.***

***Malawian women of the Chikundi Women's Club at Chitipi decided to start a poultry (broiler) operation to generate additional family income. Special funds provided by the MARE Project were made available as loans. Previously, they had experienced difficulty in obtaining sufficient credit, even though women's repayment rate for credit was well over 90%. The personal loans the women received under the MARE Project were used to purchase day-old chicks, maize seed and materials for a chicken house. Husbands were enlisted to help build the chicken house. The women received training in animal husbandry from extension staff, including information about raising chickens and disease prevention. Each woman took turns guarding the chicken house at night. During the first season of production 296 of the 300 chicks originally purchased were sold at the market. With the sale of the broilers there was enough profit for all the women to pay off their loans and share additional money for family needs. The cooperative group decided to buy 400 day-old chicks for the second production cycle.***

# Accomplishments and Impact

## Extension Aids Branch - Extension Program Highlights

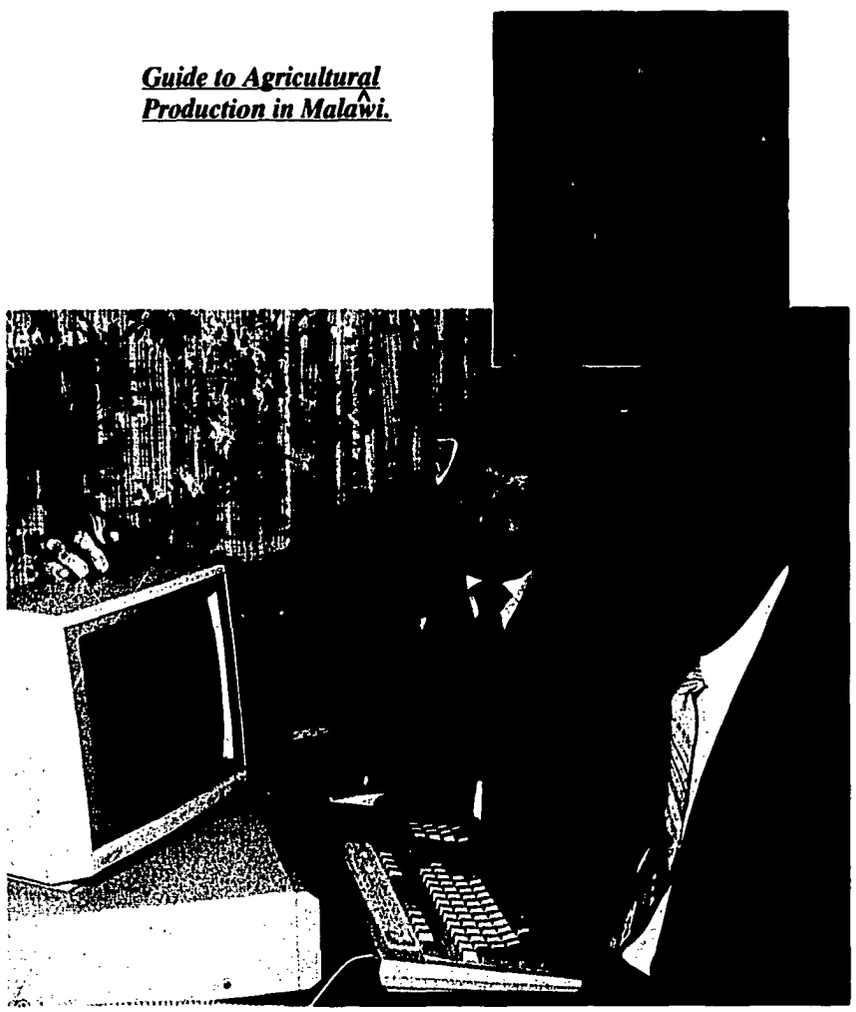
The MARE Project helped strengthen the Ministry's capacity to manage effective communication among technology developers and farm families. The MARE Project helped evaluate the effectiveness of existing extension communication approaches, and these efforts resulted in establishing a mechanism for receiving input from farmers before and after technical messages were delivered. A pilot project in northern Malawi tested communication strategies and produced recommendations for other districts about cost-effective methods of two-way communication with smallholder farmers. The various delivery channels tested were block meetings, clubs, and use of farmer's gardens as demonstration sites. Recommendations now flow to farmers, and feedback that provides clear messages of farmers' needs and problems comes back to the staff.

The project implemented a **nationwide policy** for the development and field testing of specific agricultural communication concepts that emphasize farmer and village-level extension involvement.

**New computer-based printing technology** improved quality, permitted visual enhancements, and reduced production time for the annual Guide to Agricultural Production in Malawi. The increased speed was especially important in communicating information to farmers in a timely manner.

**Video technology** was introduced, along with the necessary training and equipment. It has replaced 16mm film making, reducing time between field production and viewing, and minimizing the need for foreign currency for film processing.

***Guide to Agricultural Production in Malawi.***



***Mr. Dan Hilleman teaches desktop publishing to Extension Aids Branch staff.***

**Training opportunities,** including both in-country workshops and long-term training abroad, have improved the quality of the Extension Aids Branch materials. New technology, including computers, was introduced in a way appropriate to Malawian resources.

The Agricultural Development Divisions have reoriented the Visual Aids Units to produce improved, localized messages instead of relying on centralized messages that do not capture important local details. The MARE Project gave the Extension Aids Branch a clear role in communication leadership, which helped the Agricultural Development Divisions revitalize their effectiveness in working with farm families.

*Mr. Stanley Chimphonda provides leadership to the Extension Aids Branch.*

*Extension staff members use bicycle transport to reach their clients in villages.*

## *FAMILY LEVEL IMPACT*

*Extension staff teach hands-on skills to women farmers in their village.*

***In the past, farmers in Rumphi benefitted little from investments in agricultural research due largely to inadequate extension services. Under the MARE Project, front line extension staff were trained in improved communication approaches, equipped with a backpack full of presentation aids, and armed with carefully developed, research-based messages on improved crop production. As a result, these farm families have been able to learn about and adopt recommendations for crop production which have improved their food security.***

# The Future

## Continued Institutional Development and Support

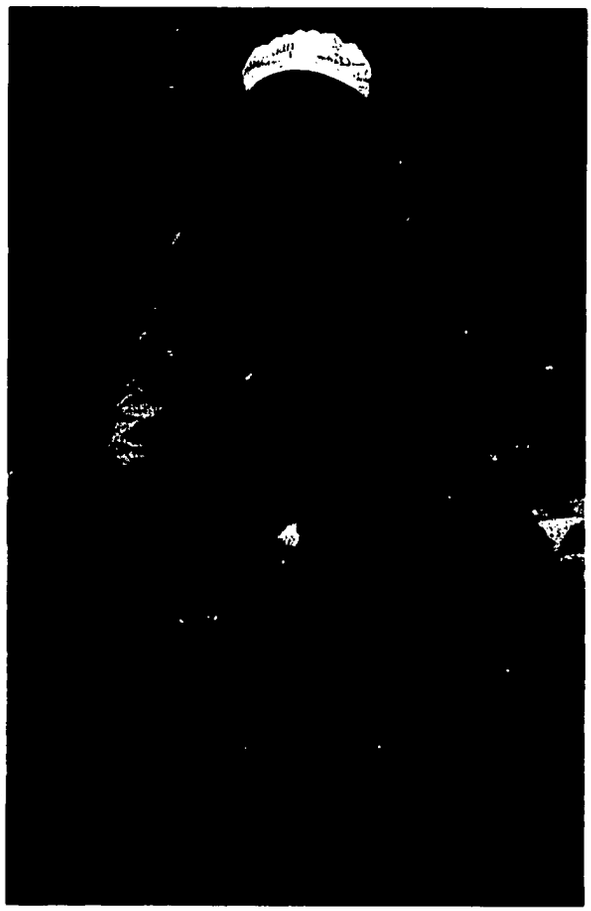
The Ministry of Agriculture, with its substantially increased number of highly trained officers, is well positioned to continue the process of institutional development. This process ensures a continuing ability to respond to the needs of the smallholder farmer.

The need for long-term linkages between the Ministry of Agriculture and the cooperating Consortium for International Development universities has repeatedly been expressed as a priority by the Ministry of Agriculture. Research and extension departments that identify technical problems could benefit from access to specialized technical services. Scientists who are developing research proposals would have easier access to literature available in collections outside Malaŵi. In general, research and extension collaboration initiated under the project could continue to benefit Malaŵian and American scientists and extension managers if these international linkages are maintained.

It is important to note that the positive impact on institutional development is affected by the trained scientific and managerial personnel who are leaving to take other positions inside and outside the country. As the Ministry of Agriculture develops an environment conducive to meeting the needs and utilizing the talents of its newly trained agricultural extension and research staff, the impact of the MARE Project will continue to grow.

## Impact

Significant impact on the ability of the Ministry of Agriculture to serve the needs of smallholder farmers is apparent through its use of improved systems for training, management, extension communication, and agricultural research.



*Successful cabbage farmer.*

As a result of complete integration of Consortium for International Development technical personnel, the benefits of technical assistance were fully institutionalized in the Ministry. Scientists and extension managers better understand the needs of Malaŵi's farm families and are developing appropriate technology to reduce the constraints on production. Methods for increased productivity, crop diversification, and environmental sustainability have been adapted to Malaŵi's agricultural research and extension programs. These programs resulted in improved production of crop and animal products, improved incomes, food security, and careful management of the environment.

***Maize planted under** Acacia albida **in Mzuzu Agricultural Development Division.***

Farm families have directly benefitted from the MARE Project through the availability and adoption of new agricultural enterprises and technologies. Farm women and men are using cost effective, environmentally sound methods of ensuring improved food security for their families.

***Malawian farm families look to a more prosperous future.***

# MARE Project Contributors

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| Name | Position | Total Person Months |
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| R.L. Tinsley | Adaptive Research Agronomist | 45 |
| R.D. William | Horticulturist | 24 |
| W.T. Bunderson | Agroforester | 52 |
| D.N. Hilleman | Agricultural Communications | 34 |
| T.E. Gillard-Byers | Adaptive Research Economist | 30 |
| C.J. Culler | Women's Programme Advisor | 38 |
| W.S. Braunworth, Jr. | Horticulturist | 42 |

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| J. Meiman | Early Evaluation | NRDP |
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| P. Day | Applied Extension Communication | EAB |
| L. McNamara | Desktop Publishing | EAB |
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| F. Shook | Video Production | EAB |
| W. Shane | Applied Extension Communication | EAB |
| W. Braunworth | Horticulture | DAR |
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| E. McBreen | Women in Agriculture Association | WP |

NRDP - National Rural Development Programme
WP - Women's Programme
MARE - Malawi Agricultural Research and Extension Project
EAB - Extension Aids Branch
DAR - Department of Agricultural Research
DAET - Department of Agricultural Extension and Training

# Malawi Agricultural Research and Extension (MARE) Project

***Project Data***

| | | |
|---|---|---|
| Term | 1986 - 1992 | |
| Funding Agencies | Ministry of Agriculture, Malawi | $ 4 Million (approx.) |
| | USAID | $ 15 Million |
| Host Institution | Ministry of Agriculture, Malawi | |
| Cooperating Agencies | Consortium for International Development<br>Oregon State University (Lead)<br>Colorado State University<br>Tuskegee University<br>Washington State University | |

Summary

The purpose of the MARE Project was to assist the Ministry of Agriculture to improve its institutional capability to increase the productivity of smallholder traditional crops, and to identify the most viable crops for diversifying smallholder production. This was accomplished by providing support to both the applied research and adaptive research programs of the Ministry of Agriculture. The Extension system was strengthened by improving linkages with research, increasing the involvement of women farmers through the Women's Programme and improving information dissemination through the Extension Aids Branch. An institutionalized staff training program in the Ministry of Agriculture was established.

***Project Components***

| | |
|---|---|
| Long-term Technical Assistance | 28 Person Years |
| Short-term Technical Assistance | 50 Person Months |
| Long-term Training | 48 Advanced Degrees for Ministry of Agriculture Staff |
| Short-term Offshore Participant Training | 57 Ministry of Agriculture Staff |
| Short-term Training in Malawi | Over 2,400 Ministry of Agriculture Staff |
| Highlights of Achievements | Through research and extension efforts, more rural women are receiving loans and earning income, more male and female farmers are planting valuable nitrogen-fixing trees and high value horticultural crops on their farms, more Malawians are receiving in-country and overseas agricultural training, and more farmers are receiving relevant timely information about crop production and diversification. |

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