



**New Partnership for
Africa's Development (NEPAD)
Comprehensive Africa Agriculture
Development Programme (CAADP)**



**Food and Agriculture Organization
of the United Nations
Investment Centre Division**

GOVERNMENT OF THE REPUBLIC OF MALAWI

SUPPORT TO NEPAD–CAADP IMPLEMENTATION

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Volume V of V

BANKABLE INVESTMENT PROJECT PROFILE

Agricultural Technology Development and Dissemination

January 2005

MALAWI: Support to NEPAD–CAADP Implementation

Volume I: National Medium–Term Investment Programme (NMTIP)

Bankable Investment Project Profiles (BIPPs)

Volume II: Commercialization of High–Value Crops

Volume III: Integrated Water Management and Rural Agricultural Credit

Volume IV: Livestock and Fishery Development

Volume V: Agricultural Technology Development and Dissemination

NEPAD–CAADP BANKABLE INVESTMENT PROJECT PROFILE

Country: Malawi

Sector of Activities: Agriculture

Proposed Project Name: Agricultural Technology Development and Dissemination

Project Area: Country-wide

Duration of Project: 5 years

Estimated Cost: Foreign Exchange n/a
Local Cost..... n/a
Total US\$8.02 million

Suggested Financing:

<i>Source</i>	<i>US\$ million</i>	<i>% of total</i>
<i>Government</i>	0.80	10
<i>Private Sector</i>	0.64	8
<i>Beneficiaries (Farmers)</i>	0.16	2
<i>Development Partners</i>	6.42	80
<i>Total</i>	8.02	100

MALAWI
NEPAD–CAADP Bankable Investment Project Profile
“Agricultural Technology Development and Dissemination”

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Abbreviations

ADB	African Development Bank
ARET	Agricultural Research and Extension Trust
BCA	Bunda College of Agriculture
DARTS	Department of Agricultural Research and Technological Services
GDP	Gross Domestic Product
MASIP	Malawi Agricultural Sector Investment Programme
MIRTDC	Malawi Industrial Research and Technology Development Centre
MoAIFS	Ministry of Agriculture, Irrigation and Food Security
NARS	National Agricultural Research System
NMTIP	National Medium–Term Investment Programme
NORAD	Norwegian Development Agency
SUCOMA	Sugar Corporation of Malawi
TRF	Tea Research Foundation of Central Africa

I. PROJECT BACKGROUND

A. Project Origin

I.1. The proposed project has previously been presented by the *Ministry of Agriculture, Irrigation and Food Security (MoAIFS)*. The *National Agriculture Development Programme*, *Malawi Poverty Reduction Strategy*, the *Review of Agricultural Policies and Strategies* and the *NEPAD–CAADP National Medium–Term Investment Programme (NMTIP)* expressly state the importance of agricultural technology generation in agricultural development. The agricultural industry in Malawi faces enormous challenges. The *Agricultural Sector Priority Constraints, Policies and Strategies Framework for Malawi* document has highlighted the eleven most critical challenges, one of which is inadequate technology development and dissemination. Indeed, a prerequisite for agricultural development is a constant infusion into farming systems of new improved technologies that are designed to overcome the major technical constraints to agricultural development.

B. General Information

I.2. The economy of Malawi is highly dependent on agriculture. The sector generates 36 percent of GDP, contributes 90 percent of foreign exchange earnings, accounts for 85 percent of paid employment and is the main source of livelihood for 85 percent of the population that is based in the rural areas. The problem, however, is that the economy is dependent on the production of primary agricultural commodities. There is very little emphasis on value–adding activities. As such, farmers in Malawi do not realise sufficient income to meet their daily needs. If farmers are to benefit more from their agricultural activities, they must go beyond mere production of primary agricultural products. In addition, as the world economy becomes more globalised, international marketing standards are also changing and becoming more challenging. Malawi must therefore keep pace with these changes. Technologies must therefore be developed that will assist in the production of products that meet international standards.

I.3. Technology generation in Malawi is undertaken by various institutions, both public and private. The major public agricultural research institutions are the *Department of Agricultural Research and Technical Services (DARTS)* in the MoAIFS, and *Bunda College of Agriculture (BCA)* of the University of Malawi. The *Agricultural Research and Extension Trust (ARET)*, *Tea Research Foundation of Central Africa (TRF)*, *Sugar Corporation of Malawi (SUCOMA)* and seed companies comprise the private institutions involved in technology generation. Together these institutions constitute the *National Agricultural Research System (NARS)*.

I.4. The various institutions in the NARS differ in their scope and mandate for research. For example, the research undertaken by BCA is an integral part of its training program and focuses on basic and applied research conducted by undergraduate and postgraduate students. ARET, TRF and SUCOMA are commodity–based research organizations focusing on tobacco, tea and coffee, and sugarcane respectively. Private seed companies are mostly engaged in breeding hybrid maize. DARTS is by far the largest public agricultural research institution in Malawi. As one of the seven technical departments in the MoAIFS, DARTS has the national mandate for technology generation for all crops and livestock, except for those commodities that are the responsibility of other institutions. The Department has a network of fifteen research stations, experimental stations and sub–stations strategically located across the country.

I.5. DARTS undertakes research in the following areas: cereals, horticulture, legumes, oilseed crops, fibre crops, livestock, pastures, soils, agricultural engineering, and plant protection. Its research

programs are designed to overcome key technical constraints to agricultural development, namely: poor soil fertility; drudgery in farm operations; poor crop varieties and livestock breeds; poor crop and livestock management practices; diseases and pests; erosion of genetic biodiversity; and post-harvest losses of agricultural produce.

II. PROJECT FOCUS

II.1. The proposed thematic areas for the project and the responsible research institutions are indicated below.

Research Area/ Agricultural Product	Research Theme	Responsible Institutions
Cotton	<ul style="list-style-type: none"> Improving existing varieties Introducing new high yielding, pests and disease resistant varieties 	<ul style="list-style-type: none"> Makoka Research Station (Zomba) Chitala Research Station
Legumes (pigeon peas and soya beans)	<ul style="list-style-type: none"> Improving existing varieties Introducing new high yielding, pest and disease resistant varieties 	<ul style="list-style-type: none"> Chitedze Research Station
Cassava	<ul style="list-style-type: none"> Improving existing varieties Introducing new high yielding, pests and disease resistant varieties 	<ul style="list-style-type: none"> Chitedze Research Station Bvumbwe Research Station
Fruits (citrus fruits — oranges, lemons and tangerines — and bananas)	<ul style="list-style-type: none"> Improving existing varieties Introducing new high yielding, pest and disease resistant varieties 	<ul style="list-style-type: none"> Bvumbwe Research Station
Livestock (poultry, dairy and beef animals, draught animals)	<ul style="list-style-type: none"> Improving existing breeds 	<ul style="list-style-type: none"> Bunda College of Agriculture
Fish (aquaculture, Chambo fish)	<ul style="list-style-type: none"> Improving existing species Introducing new high yielding and fast maturing species, e.g. <i>O. niloticus</i>. 	<ul style="list-style-type: none"> National Aquaculture Centre (Zomba)
Post-harvest technologies for agricultural products	<ul style="list-style-type: none"> Storage technologies to increase shelf life Agricultural processing technologies Value adding technologies 	<ul style="list-style-type: none"> Malawi Industrial Research and Technology Development Centre (MIRTDIC) Bunda College of Agriculture
Irrigation technologies	<ul style="list-style-type: none"> Identification of irrigation methods suitable for small scale farmers Economic feasibility of such technologies 	<ul style="list-style-type: none"> Malawi Industrial Research and Technology Development Centre Bunda College of Agriculture

III. PROJECT RATIONALE

III.1. Inadequate technology is one of the major constraints to agricultural development in Malawi. Improved agricultural technologies are tools that empower farmers to raise their productivity and thus attain higher incomes and increased food security. Without the application of improved agricultural technologies, agricultural productivity cannot grow.

III.2. Investment in agricultural technology development has been shown to yield high returns. For example, the Malawi *Public Expenditure Review* (1997) undertaken jointly by the World Bank and Malawi Government cites over 100 percent return to investment in technology development in the country. Examples of technologies that have yielded high returns are new cassava and sweet potato

varieties whose adoption is very high. A constant infusion of high-impact agricultural technologies into farming systems is a prerequisite for accelerated agricultural development. However, this can only be attained if the national agricultural research system is a dynamic and responsive system that focuses on farmers’ priorities but also takes national priorities and policies into consideration. This project has been proposed so as to ensure that there is adequate capacity in Malawi to develop various agricultural technologies that can benefit agricultural producers, the private agribusiness sector, and the research institutions themselves.

IV. PROJECT OBJECTIVES

IV.1. The *overall objective* of the project is to promote the development of new agricultural technologies and the dissemination of the same and existing ones to the farming community and the private sector.

IV.2. The *specific objectives* are to:

- build the capacity of research institutions so as to enable them to undertake appropriate research, and develop new and improved technologies for the agricultural sector;
- document all the existing agricultural technologies;
- disseminate the successfully tested technologies to the stakeholders; and
- review and update Malawi’s *Agricultural Research Master Plan*.

IV.3. The current agricultural research programmes are based on an agricultural research master plan which was last revised in 1995. Presently, the programmes are developed and agreed on through consensus using several fora such as the *Annual Commodity Group Meetings*, the Technical Sub-Committee of the Agricultural Research Council and the *Departmental Annual Conference*. Through these fora, inputs from stakeholders are sought both at operational and policy levels. An updated master plan would guarantee that agricultural research programmes reflect national agricultural priorities.

V. PROJECT DESCRIPTION

V.1. The project will run for five years and will involve four components:

- Support to Research Institutions;
- Research results dissemination;
- Identification, documentation and dissemination of agricultural value adding technologies for agricultural primary products; and
- Review and updating the *Agricultural Research Master Plan*.

Component 1: Support to Research Institutions

V.2. This component is aimed at enhancing the capacity of agricultural research institutions to engage in research activities in the following areas:

- Development of new agricultural technologies (crops, livestock and fish);
- Dissemination of the new and improved technologies; and
- Building capacity for research staff (training).

V.3. A considerable number of new agricultural technologies have been developed in Malawi. However, most have been in crop production (especially in a few crops such as maize, tobacco and a few legumes). Very little has been done in livestock, fish and value-addition. The research institutions need to have adequate funds and human resources to continue and expand their research to include these neglected areas.

V.4. Funding for agricultural research is obtained from two sources: the revenue budget and grants from donors and private companies. Revenue funding is by far the greater of the two sources and accounts for over 80 percent of the funding made available to research. However, revenue funding for agricultural research is only 0.05 percent of agricultural GDP as opposed to 2.5 percent which is recommended internationally. Furthermore, the research: extension funding ratio is 1:10 which clearly shows that government attaches much greater importance to extension than research. The grant component for agricultural research is also low, comprising less than a quarter of the department’s total annual budget. As a result, research activities are severely limited.

V.5. The project will therefore have a competitive grant fund from which researchers will be able to benefit on merit. A good quality research proposal will be required for a researcher to access these funds. The funds will be used for the procurement of research equipment and genuine research activities. Researchers will apply for the funds to be released by submitting detailed proposals for research of their interest. A panel of project experts will examine the proposals for approval or otherwise.

V.6. Support to the research institutions will also be in form of capacity building for the members of staff. At present, the *Department of Agricultural Research and Technical Services* has a 50 percent vacancy. There is shortage of critical mass in areas such as horticulture, livestock, post-harvest handling, biotechnology, soil fertility, plant genetic resources conservation, and economics. The high vacancy rate is a result of a combination of factors including retirement, death, and resignations coupled with lack of recruitment of new scientists. The new scientists available need training to develop their research skills. Training at Masters degree level and PhD level is a prerequisite. The project will therefore have a special fund, which will be used for this purpose.

Component 2: Dissemination of the New and Improved Technologies

V.7. The adoption rate of new technologies in Malawi is low (25–30 percent for hybrid maize and much lower for other technologies). Consequently, the impact of agricultural research has been less than expected. Poor research–extension–farmer linkage is a major factor contributing to the low adoption rate of improved agricultural technologies. As a result, many improved technologies with high-impact potential do not reach the farmer. On the other hand, research sometimes focuses on problems that are not directly relevant to farmers, resulting in the development of inappropriate technologies. A strong research–extension–farmer linkage would ensure that research is demand-driven and that the resulting technologies have a high adoption rate and impact. The value of research is undermined if the results are not disseminated to the targeted users.

V.8. The government, through the agricultural extension services, is traditionally responsible for the dissemination of information amongst farmers. Extension services are, however, very weak. The

project would endeavour to increase the capacity of the extension staff to execute their duties by providing them with appropriate training. The linkage between research and extension will also be strengthened through frequent consultations between research institutions and extension staff.

V.9. The project will also support research dissemination workshops where researchers, farmers and representatives of producer organizations, agricultural extension staff and NGO’s that are involved in agricultural extension services will meet to discuss research results and technologies that have been developed and improved.

Component 3: Identification and Documentation of Value-adding Technologies for Agricultural Products

V.10. Very little value-addition on agricultural products is undertaken in Malawi. It appears that most farmers and even the private sector have not been exposed to the various value-adding techniques that are available locally, in the region and internationally. This component of the project is meant to collect information on the various value-adding techniques that are available, document them and make the information available to farmers as well as the private sector. The products and technologies targeted in this project component include, but will not be limited to:

- Oil extraction techniques from soya bean, groundnuts, sunflower, cottonseed, castor oil and many other oil-bearing seeds;
- Processing of animal feed, including from crop seed cakes (cotton, soya, groundnuts);
- Processing of cassava into starch, glue, animal feed, flour (for human consumption);
- Processing of soya beans into soya chips, milk and nutritious flour for children’s porridge;
- Food recipes for human consumption. Provide short-term training to field staff on specific food and nutrition technologies such as food processing, dietary dissemination and recipe development;
- Leather tanning from goat and cattle hides;
- Fish processing techniques to increase shelf life and ease transportation;
- Production of livestock feed (e.g. chicken feed).

V.11. The project would take cognisance of the fact that there are some large scale private companies that are involved in processing of some of these commodities, hence, the project will target small-scale processing enterprises.

Component 4: Review and update Malawi’s Agricultural Research Master Plan

V.12. The current agricultural research programmes are based on an agricultural research master plan which was last revised in 1995. At present, research programmes are developed and agreed upon through consensus using several fora such as the annual commodity group meetings, the Technical Sub-Committee of the Agricultural Research Council and the Departmental Annual Conference. Through these fora, input from stakeholders is sought both at operational and policy level. An updated master plan would ensure that the agricultural research programs reflect current national agricultural

priorities. The project will therefore have a component which will aim at reviewing and updating the research master plan.

VI. INDICATIVE COSTS

Item	Cost (US\$ million)
Agricultural Research (a)	2.500
Research and Technology Dissemination (seminars, field days, leaflets, radio, newspaper and television messages)	0.350
Capacity Building (training for researchers and agricultural extension workers) (b)	4.500
Identification and Documentation of Value-adding Technologies (c)	0.250
Review of the Research Master Plan (workshops for revision of the Master plan and consultations with all relevant stakeholders)	0.045
Technical Assistance (d)	0.250
Project Management (e)	0.350
Total Project Cost	8.020
Notes: a) Assumption is the figure that there will be 25 research activities every year, each estimated to cost about US\$25,000. b) The amount is to finance training more scientists for the research stations. At least two scientists will be trained to PhD level from each research station. The funds would also be available for refresher training for extension workers. c) To be used for investigating value-adding technologies for various commodities available within the country and abroad which can easily be adapted for use by interested Malawians. This information will be compiled and published. d) The funds will be used to pay for accommodation, salaries and other benefits for the technical expert to be recruited for the project for a period of three years. e) For day to day running of the project, including procurement of project vehicles and office equipment.	

VII. PROPOSED SOURCES OF FINANCING

VII.1. The financial support for project implementation is expected to come from government sources and from Malawi’s development partners. Government contribution will be in kind, i.e. in terms of staff, supplying offices/buildings for research and extension staff. Through the government’s yearly budgetary provision, direct financial support would be availed to the project.

VII.2. The bulk of the funding for actual project implementation will come from co-operating partners, especially NORAD and ADB.

VIII. PROJECT BENEFITS

VIII.1. The project will benefit the entire agricultural sector. More specifically, benefits will accrue to:

- **Commercial Farmers:** Well-tested and improved technologies (e.g. improved seed of various crops) will be made available to them.
- **Private Sector:** Value-adding technologies will be available for transformation of primary commodities into high value products. This is likely to result in the development of several small to medium scale manufacturing enterprises.

- **Research Institutions:** Research institutions will be better staffed and equipped, and therefore have the capacity to develop appropriate technologies for the farming and agribusiness sectors.
- **Government Extension Services:** The capacity of the extension services will be enhanced through training of extension staff in areas such as appropriate smallholder irrigation technology.

VIII.2. If the project is successfully implemented, the food security and incomes of smallholder farmers will undoubtedly improve.

IX. IMPLEMENTATION ARRANGEMENTS

IX.1. The project would be implemented by the MoAIFS through the DARTS. The research funds will be controlled by this Department and the project will target all research institutions that are involved in technology generation.

IX.2. A management team under the DARTS will be established to co-ordinate all the activities of the project. Apart from this unit, there will be a research committee comprising reputable scientists and senior officers from the MoAIFS and the committee will be responsible for the evaluation and approval of all research proposals.

X. TECHNICAL ASSISTANCE REQUIREMENTS

X.1. Technical assistance will be required to set up the project and provide expertise in post-harvest research and technologies. The experts will be either Malawian nationals or international experts of proven experience in the required areas.

X.2. The experts will be responsible for:

- Setting up the project and developing its management system; and
- Guiding and evaluating post-harvest research projects (value adding technologies)

XI. ISSUES AND PROPOSED ACTIONS

XI.1. **Administration of research funds:** The project will have a considerable amount of funds for research activities and will therefore require systematic financial management procedures to ensure transparency and accountability.

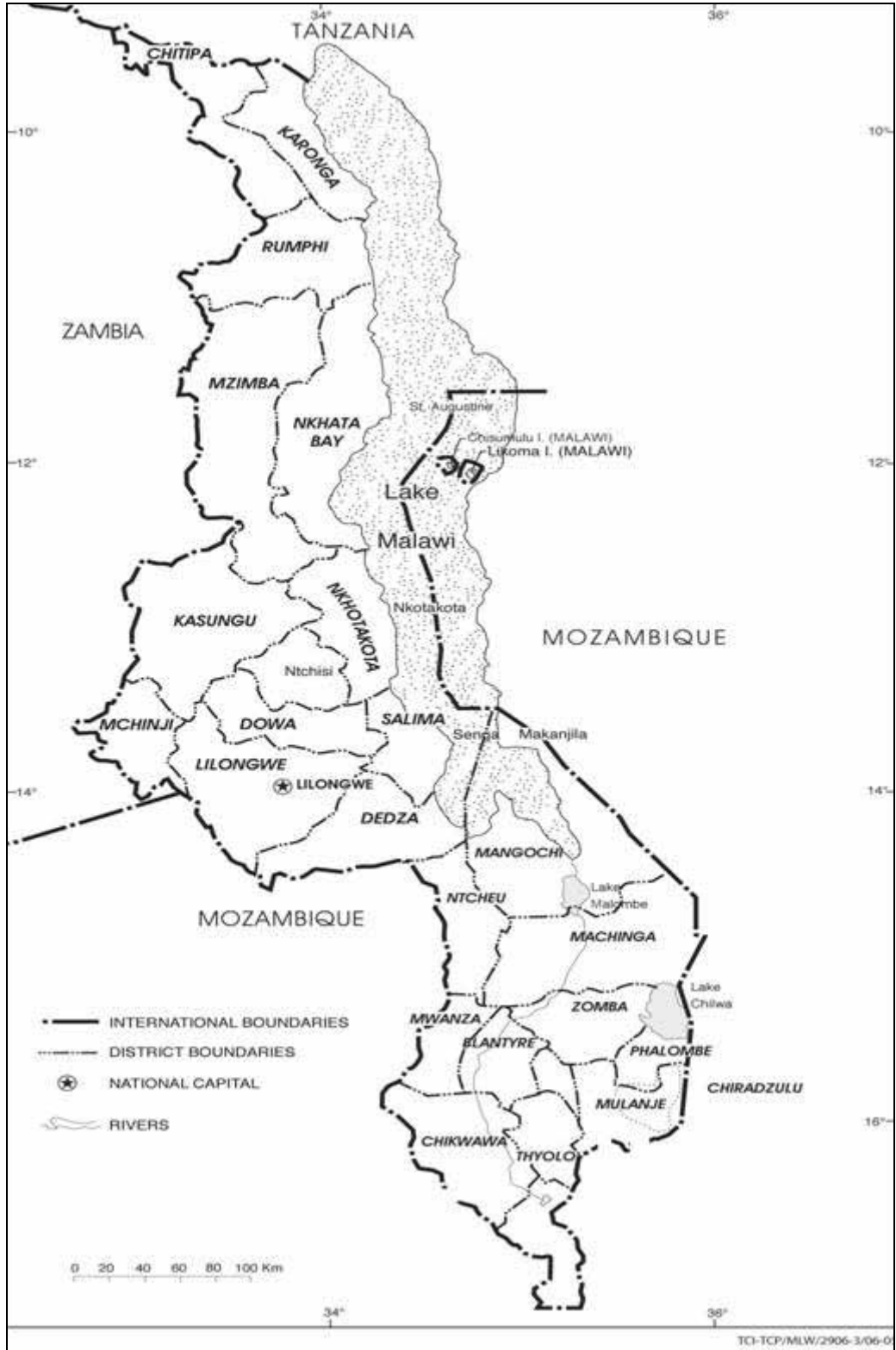
XI.2. **Applicability of research results:** Numerous research activities have not had any impact on agricultural development because the research findings have not been packaged in a form that can be easily understood by both extension staff and farmers. Concerted efforts will therefore be made to ensure that research results are made available to the extension services in a form that can be easily understood by extension officers and farmers. Appropriate materials, some in vernacular languages, will also be developed for smallholder farmers. Follow-ups by both the research and extension services will be undertaken to determine if the new technologies are being adopted by farmers, and to assist wherever possible.

XII. POSSIBLE RISKS

XII.1. *Delays in sourcing funding:* The bulk of the finances are expected to be sourced from co-operating partners. However, the country may experience delays in sourcing such funds. The solution lies in the government vigorously marketing the project proposal to potential funding agencies and meeting its financial obligations to the research and extension services.

XII.2. *Implementation strategy:* This is a fairly complex project which will involve a considerable number of research activities encompassing many agricultural products, as well as technology dissemination, capacity building and the search for value-adding technologies. If the management team does not have adequate skills to manage such a project, resources could be wasted.

Appendix 1: Map of Malawi



Appendix 2: References

1. **FAO.** 2003. *Malawi Agricultural Recovery Plan of Action* (July 2003 – December 2004).
4. **Government of Malawi.** 2001. *Poverty Reduction Strategy Paper for Malawi.* Ministry of Economic Planning and Development.
3. **Government of Malawi.** 2001a. *Agricultural Sector Priority Constraints, Policies and Strategies Framework for Malawi.*
4. **Government of Malawi.** 2003. *Malawi Economic Growth Strategy.*