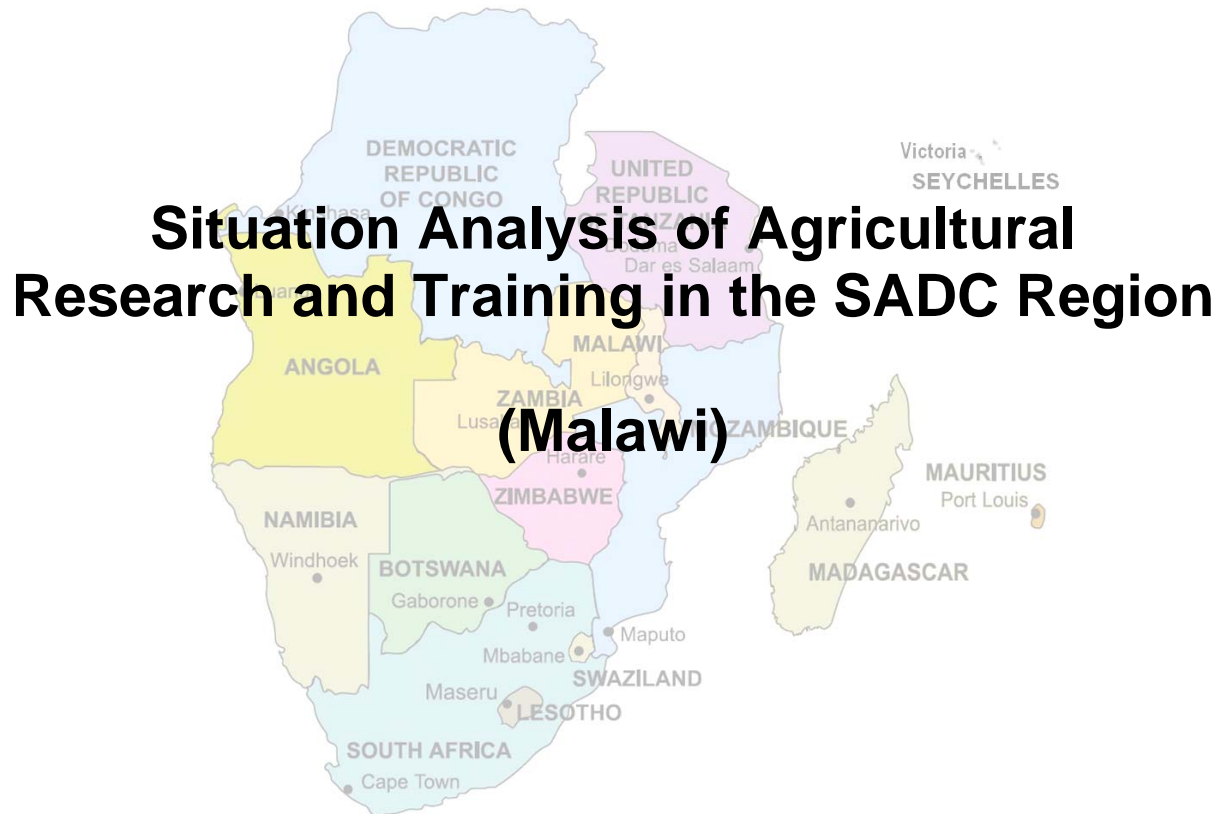




IMPLEMENTATION AND COORDINATION OF AGRICULTURAL RESEARCH AND TRAINING (ICART) IN THE SADC REGION



***FANR Directorate
SADC Secretariat
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“The authors accept sole responsibility for this report drawn up on behalf of the Regional Authorising Officer of SADC Secretariat. The report does not necessarily reflect the views of the SADC Secretariat, nor of the European Commission”



Consultancy Report on Situation Analysis of Research and Training in Agriculture and Natural Resources in Malawi

Submitted to

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Research and Training in the SADC Region (ICART)
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Abbreviations and Acronyms

ADD	: Agricultural Development Divisions
ADMARC	: Agricultural Development and Marketing Corporation
ADP	: Agricultural Development Programme
AGRIMAL	: Agriculture Implements of Malawi
AMG	: ARDEP Management Group
APB	: ARDEP Board
ARC	: Agriculture Research Council
ARDEP	: Agricultural Research and Development Programme
ARET	: Agriculture Research and Extension Trust
ATC	: Agricultural Trading Company
ATCC	: Agricultural Technology Release Clearance Committee
CARO	: Chief of Agricultural Research Officer
CGIAR	: Consultative Group on International Agricultural Research
CGS	: Competitive Grant Scheme
CIAT	: International Centre for Tropical Agriculture
CSIR	: Council for Scientific and Industrial Research
CSO	: Civil Society Organization
CYMMIT	: Center for Maize and Wheat Improvement
DAES	: Department of Agricultural Extension Services
DAHI	: Department of Animal health and Industry
DARTS	: Department of Agricultural Research and Technical Services
DCP	: Department of Crop Production
DLRC	: Department of Land Resources Conservation
DoF	: Department of Fisheries
DWASCO	: Dwangwa Sugar Corporation
FARA	: Forum for Agriculture Research in Africa
FRIM	: Forestry Research Institute of Malawi
FUM	: Farmers Union of Malawi
GDP	: Gross Domestic Product
ICART	: Implementation and Coordination of Agricultural Research Training
ICRAF	: International Centre for Research in Agroforestry

ICRISAT	: International Crops Research Institute for the Semi-Arid Tropics
IHS	: Integrated Household Survey
IITA	: International Institute of Tropical Agriculture
M&E	: Monitoring and evaluation
MEPC	: Malawi Export and Promotion Council
MGDS	: Malawi Growth Development strategy
MIRTDC	: Malawi Industrial Research and Technology Development Centre
MRIUP	: Malawi research Into Use Programme
MVAC	: Malawi Vulnerability Assessment Committee
NARS	: National Agricultural Research Systems
NASFAM	: National Smallholders Farmers of Malawi
NGO	: Non Governmental Organizations
NLDMP	: National Livestock Development Master Plan
NRCM	: National Research Council of Malawi
OPC	: Office of the President and Cabinet
POSAM	: Pesticides Association of Malawi
RUFORUM	: Regional Universities Forum for Capacity Building on Agriculture
SADC	: Southern African Development Community
SADC-FANR	: SADC's Directorate Food, Agriculture and Natural Resources
SANBio	: Southern African Network for Biosciences
SARRNET	: Southern Africa Research on Roots and Tubers Network
SCA	: Smallholder Coffee Authority
SCARDA	: Strengthening Capacity for Agricultural Research in Africa
SUCOMA	: Sugar Corporation of Malawi
SWAP	: Sector Wide Approach
TCC	: Tobacco Control Commission
TNA	: Tree Nut Authority
TRF	: Tea Research Foundation
TRIM	: Tobacco Research Institute of Malawi
USAID	: United States Agency for International Development
WFC	: World Fish Center

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Executive Summary

The programme Implementation and Coordination of Agricultural Research Training in the SADC Region (ICART) is a regional agricultural research and training programme operating under the auspices of the Food, Agriculture and Natural Resources Directorate (FANR) of the SADC Secretariat, responsible for the coordination of the agricultural training programs.

ICART aims at contributing to achieve to economic growth and poverty alleviation by organizing within the SADC region innovative agricultural research and training activities to promote sustainable use of natural resources which is in line with the Malawi Growth and Development Strategy (MGDS). ICART however, is designed to enable national agricultural research programmes, and National Agricultural Research Systems (NARS) where they exist (involving public sector research and training institutions in agriculture, private sector research and technology generation companies, and professional agricultural organizations) to generate through empirical means innovative solutions to: a) Strengthen both in-country and regional cooperation in order to increase agricultural production, productivity and quality and b). Improve incomes of small-scale farmers and profits within the value chain involving processors, traders and other beneficiaries, while maintaining the natural resources base.

In order to achieve its overall objectives ICART has embarked on a four - phase situation analysis primarily to identify, appraise and assess constraints, and recommend support strategies for existing NARS, and for research network servicing agricultural production and rural development in the SADC region. Phase 1 of the Situational analysis consisted of desk study of information available at the SADC Secretariat and through internet. Phase 2 consisted of four consultants effecting country visits to establish a rapid appraisal of the institutional set up within ADC Member states and establish a preliminary comparison of the 14 member states, based on their short visit. The current study constitutes phase 3 using national consultants essentially to supplement the phase 2 and produce a country report.

The situation analysis of research and training in agriculture and natural resources in Malawi was conducted between November 2007 and February 2008. Desk studies were done by looking at relevant documents related to the work. In addition various organizations were visited in trying to elicit answers to the questions posed through the set of themes in the terms of references.

The study revealed the following:

1. MDGS is the prime policy in which the NARS institutional policy framework is supposed to be feeding into. But this was not the case as other policies were formed before it. In addition many policies from different ministries were found to have agriculture and natural resources component on them. However, although the institutional framework for formulation, implementation, coordination, monitoring and evaluation of these policies was at sectoral ministry or departmental level and the linkage between them is generally weak as institutions act independently.
2. several ministries policies including: Agriculture and Food Security, Education, Science and Technology, Energy and Mining, Lands and Natural Resources, Tourism, Wildlife and Culture, Economic Planning and Development, Irrigation and Water Development and Ministry of Trade and Private Sector Development were relevant to agriculture research and training.
3. It was discovered that several registered institutions deliver high level training and in-service training in both agriculture and natural resources. The level ranged from a certificate to a PhD both in agriculture and natural resources. The Ministry of Agriculture and Food Security however is the most prominent in technology generation, dissemination and extension service delivery complemented by the Universities of Malawi and Mzuzu.

4. The other institutions which carry out research on specific crops are Agricultural Research and Extension Trust (ARET) and Tea Research Foundation (TRF) on tobacco and tea respectively.
5. There are a number of CGIARs centers operating in the country which include: International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), International Centre for Tropical Agriculture (CIAT), International Centre for Research in Agroforestry (ICRAF) [World Agroforestry Centre], International Institute of Tropical Agriculture (IITA)/Southern Africa Research on Roots and Tubers Network (SARRNET), Center for Maize and Wheat Improvement (CYMMIT) and World Fish Center (WFC). Most of these collaborate with the NARS.
6. Monitoring and Evaluation (M&E) exists in the DARS and this is used during planning, implementation and reporting of research priorities. The M&E team is composed of members of the Agriculture Research Council (ARC) from different institutions i.e. government, NASFAM, private sector, TRF, NRCM.
7. Identification of roles and research needs of private sector organizations was done by DARS but NGOs should be encouraged to participate in research and training because they are the ones who are in direct contact with the farmers and their objectives should be set in line with the national research needs.
8. The traditional methods in research are still used i.e. starting from the conceptual framework, laboratory and the field. However, apart from the mentioned methods participatory approaches in research and development together with the use of model villages are also quite often in use.

9. Sources for demand for research are generated from the stakeholders involved in the value chain.
10. The RUFORUM model, the linkage between the CGIARs and DARS and the model used by ARET and TRF were found to be those examples which could be spread across the region for adoption as a best practice.
11. DARS was found to be linked to a lot of public, private, parastatal and international institutions in its activities.
12. The CGIARs activities were found to spread across the SADC region in the harmonization of research activities. The RUFORUM, SANBio activities were found to have a regional flavour.
13. DARS also maintains good contacts with other research institution outside the country. Individual commodity groups continue to benefit from such contacts in terms of obtaining genetic materials, information and training programmes from IARCs that come under the umbrella of Consultative Group on International Agriculture Research (CGIAR).

The study recommends the following:

- The collaboration of DARS and DAES should be more specific
- On a national level there is need to have a harmonization in the policies and there should be formal linkages among the NARS.
- ARC should be given strong legal mandate which does not exist at present.
- There is need for harmonization of research and policies in the region e.g. seed release and chemical testing.
- There is also need conduct to conduct collaborative research in climate change.

- The NGOs should conduct research towards development of their technologies.
- More funds should be provided towards research and training by both the government and NGOs.
- There is need for more analysis of the methodology and to consult the ADP process.

1.0 Introduction and Background

1.1 Introduction to the study

The programme Implementation and Coordination of Agricultural Research Training in the SADC Region (ICART) is a regional agricultural research and training programme operating under the auspices of the Food, Agriculture and Natural Resources Directorate (FANR) of the SADC Secretariat, responsible for the coordination of the agricultural training programs.

ICART's overall objective is to contribute to regional economic growth and poverty reduction/alleviation by organizing within the SADC region framework innovative agricultural research and training activities to promote sustainable use of natural resources. This will lead to increased agricultural production through application of improved technologies, and the implementation of policies that will enable resource-poor smallholder farmers to achieve improvements in their livelihoods. Research findings and the training of researchers and professionals will contribute to the creation of an enabling environment for all stakeholders in agricultural production, thus improving both food security and economic status of the countries concerned.

In the context of ICART, agriculture is understood to include crop production, animal husbandry and the gathering of biological products, together with the sustainable exploitation of natural resources used in agriculture and the latter's impact on the environment. Agriculture also encompasses agricultural

economics and policy making, rural livelihoods and the social issues of farming that affect farmers, herders and gatherers.

The program is designed to enable national agricultural research programmes, and National Agricultural Research Systems (NARS) where they exist (involving public sector research and training institutions in agriculture, private sector research and technology generation companies, and professional agricultural organizations) to generate through empirical means innovative solutions to:

- a) Strengthen both in-country and regional cooperation in order to increase agricultural production, productivity and quality.
- b) Improve incomes of small-scale farmers and profits within the value chain involving processors, traders and other beneficiaries, while maintaining the natural resources base.

1.2 Terms of Reference of the study

Theme 1

- Assessing with relevant Ministries the policies for research and training in agriculture
- Identify relevant private sector organizations and their research needs
- Establish the list of registered institutions/organizations delivering high level training and in-service professional training in agriculture
- Assess with the Ministries the formal existence of NARS and the monitoring mechanisms, the contribution of research stakeholders

- Document working methodologies
- Identify actual and potential demand for cooperative relationships between research and training institutions and the farmers' organizations and private sector
- Appraise in-country research alliances

Theme 3 (Networking for Agriculture training, research and development)

- Appraise across the SADC region research alliances
- Appraise cooperation with foreign/international research institutions
- Identify the needs for research networks serving SADC priorities.

2.0 Methodology of the study

The information for the study was collected through both primary and secondary sources. In the primary source questions attempted to solicit data/information across the terms of references of the study. Secondary data sources were, wherever possible, collected from the consulted organizations in order to supplement information/data collected through direct discussions with the contacted individuals.

The selection of the institutions consulted was undertaken purposefully based on their significance in the agricultural research and training. Amongst the institutions consulted are those from the public, semi-public, NGO, civil society and private sectors.

Preliminary findings from the stakeholder consultations and literature review were presented at a national validation workshop (9th - 10th February 2008, Kambiri Holiday Resort, Salima District) to solicit stakeholder comments and contributions. This report incorporates comments and contributions from the national validation workshop (for more details refer to the workshop proceedings - prepared as a separate report).

3.0 Background Information on Agriculture in Malawi

3.1 Economic and Social Context

Malawi is basically an agricultural country located in South-East Africa surrounded by Tanzania, Mozambique and Zambia. It is a long and narrow country that extends from 9° 45' to 17° 51' south of the equator that translates into approximately 900 Km in length from north to south and varying in width from 33.5° to 35.25° (80 to 180 Km). The total area is 12.3 million hectares of which 2.9 million hectares is under water (DARS, 2000).

Malawi's total population in 2005 was estimated at 12.3 million of which about 60 percent is under the age of 20. The 2004/2005 Integrated Household Survey (IHS) reveals that 52.4 percent of the population live in poverty. The incidence of poverty is higher in the rural areas (66.9 per cent) than in the urban (54.9 percent) areas. Socio-economic trends in Malawi remain unfavorable compared to other countries within the Southern African Region.

Malawi's health indicators are based on maternal mortality rate, child mortality rate, child and maternal malnutrition, life expectancy, and access to health facilities. While implementing a number of policies, the country has made some achievements in health sector, although, some of the health indicators are still the worst in the world. For instance, for every 100,000 live births, 1120 mothers die due to limited access to quality reproductive and

health services. Infant mortality rate and child mortality rate are estimated at 76 and 133, per 1000 live births respectively due to limited access to health services. Malnutrition remains both a cause and consequence of poverty. It is one of the most important health and welfare problems faced by many Malawians especially among the urban poor and the rural population. The life expectancy at birth, which was at 47 in 1987, has now fallen to about 37 mainly due to the HIV and AIDS pandemic. As a result of low life expectancy and high fertility rates, Malawi has a young and dependent population. This is another scenario that highlights the gravity of poverty situation in the country. In response to this current health situation, the Malawi government, through the MGDS 2006-2011, has developed strategies in the area of health and population that will help to achieve improved health for the population and increased number of people with good/high living standards.

HIV and AIDS pandemic have severely affected Malawi, like many other Sub-Saharan African countries. The first case was reported in 1985 and to-date despite so many years of national response, the impact remains devastating and the country's efforts are inadequate given the pace of the spread of HIV and AIDS. The national adult prevalence in reproductive age group of 15-49 has slightly declined from 14.4 percent in 2003 to 14.0 percent in 2005 (MGDS, 2006). The devastating impact of HIV and AIDS on agriculture is causing untold misery to most households especially in the rural areas where over 80 percent of the total population lives and also where agriculture is synonymous to

livelihood security. The problem of HIV and AIDS has two effects in the sector. The first problem is that labor shortage in agriculture due to farmers attending sick relatives and sick people failing to give labor due to tiredness.

Education is the key for attaining prosperity. It is a catalyst for socio-economic development, industrial growth and an instrument for empowering the poor, the weak and the voiceless. Education enhances group solidarity, national consciousness and tolerance of diversity. On the other hand, there are factors compromising education quality and relevance, which include: cultural attitudes on education for girls, inadequate infrastructure including for people with special needs, and lack of school inspection or effective supervision and monitoring. In spite of high enrolment rates at both primary and secondary school levels, literacy rates, in general for all women have remained low, when compared to their male counterparts. The government is implementing a number of reforms in order to improve the current situation especially to increase both access and retention at all levels; improve equity, management and supervision; and the training of more teachers for both primary and secondary school levels.

The performance of Malawi's economy in the past years has not only been unstable, but also dismal between the period of 2001 and 2004. The Malawi Growth Development Strategy (MGDS) (2006) indicates that during this period Gross Domestic Product (GDP) averaged 1.5 percent per annum; Savings and

investment ratios have remained low over the period largely on account of low disposable incomes; and National savings as a share of GDP has remained below 3.2 percent while the gross investment has been below 11.2 percent. This disparity shows national savings has not driven investments. The MGDS further indicates that the government is committed to pursue sound economic policies geared at increasing and sustaining economic growth, reducing inflation rate, maintaining flexible exchange rate and improving foreign reserve position. Moreover, enhancing the country's export capabilities will result into increased employment and improved trade balance. It is, therefore, estimated that on average the economy is expected to grow by more than 6.0 percent annually during the period of 2006-2011. This is expected to emanate from growth from agriculture, manufacturing, mining as well as service sectors. Consequently, per capita income is expected to increase from average of US\$160 to an average of US\$450 by the end of 2011 (MDGS, 2006).

As was the case with many developing countries at independence, Malawi had no significant private sector. Subsequently, the government assumed responsibility in spearheading development efforts. With no proven mineral resources, and absence of a vibrant manufacturing sector, the agricultural sector assumed the role of the engine for growth. It is not surprising to note, therefore, that the dominant economic activity in Malawi is agriculture. Over the years, the structure of the economy has not changed much and agriculture

remains the backbone of the economy contributing between 33 % and 40 % of the GDP.

3.2 Importance of Agriculture in Malawi

The agriculture sector accounts for about 93 per cent of the total export earnings, provides more than 80 per cent of the total employment and contributes about 35 per cent of the country GDP. Furthermore, the sector contributes 63.7 percent of total income from the rural poor. Agriculture activities currently occupy about 56 per cent of the land area covering 5.3 million hectares of the country's 9.4 million hectares and supply at least 65 percent of the manufacturing sector's raw material requirements (DAES, 2000). The agricultural sector of Malawi is dualistic, consisting of small-scale farmers and the estate sub-sector. The sub-sectors have been historically distinguished on the basis of legal and constitutional rules regulating land tenure, type of crops and marketing arrangements.

The smallholder sub-sector is based on customary land tenure system and is primarily subsistence. The estate sub-sector comprises 14,700 estates occupying 850,000 hectares of leased land. Over 70 per cent of the cultivated area in Malawi is under the customary land tenure system and is utilized by 1.2 million smallholder farming families with land holding ranging from 0.5 to 2.5 hectares (DARS, 1995). Smallholder farmers produce numerous crops such as

tobacco, maize, sweet potatoes, groundnuts, pulses, Irish potatoes, cassava, sorghum, rice, sunflower, wheat, vegetables, fruits, coffee, macadamia, cashew and spices. They also keep livestock such as cattle, sheep, poultry, goats, rabbits and pigs. Maize, as the staple food, is the most important crop to the Malawian population and occupies about 68 percent of the total land for crops. The estate sector primarily produces cash crops such as burley and flue cured tobacco, sugar, coffee, tea and tree nuts (macadamia and cashew). The three main cash crops tobacco, sugar and tea account for about 80 percent of the total exports. Tobacco alone contributes as much as 70 percent of Malawi's foreign exchange.

The livestock industry, on the other hand, contributes about 8 per cent of total GDP and about 36 percent value of the total agricultural products. Livestock provides food, income, manure, animal traction and social security. Taking all these into consideration, livestock has the potential to contribute more than 11 per cent to the GDP. Livestock provides potential food security among vulnerable groups such as female-headed, elderly and orphan headed households. There are about 1.2 million people who own one or more of the various types of livestock. About 15 percent of all livestock farmers are commercial and the rest are subsistence.

3.3 Agro-ecological Zones and Farming Systems

Malawi enjoys a variety of ecological zones broadly grouped into: Lower Shire valley; lakeshore and low-lying rain shadow areas; medium altitude areas; and high altitude plateau and hilly areas. Unique features in terms of rainfall, temperature, altitude and agricultural operations as described below characterize each of these zones:

The Lower Shire Valley zone lies between 30 to 500 metres above sea level embracing two southern most districts of Chikwawa and Nsanje. The area receives less than 600mm annually and is generally not suitable for rain-fed farming for most crops grown in Malawi. The narrow range of crops grown includes sorghum and millet with some exception of one small portion of a hilly area. However, the area is very fertile and suitable for irrigated farming especially for vegetables and maize. It has an estimated population of about 0.2 million households. Dry land agriculture embraces cotton production, livestock rearing while as irrigated agriculture consists of sugar cane, rice and banana production

The lakeshore and low altitude rain shadow zone lies between 400 to 1000 metres above sea level. Rainfall ranges from 600 to 800 mm annually. The areas are characterized by very fertile alluvial soils and high average temperatures. The districts in this zone include: Balaka, Karonga, Mangochi, Mwanza, Nkhata-Bay, Nkhota-Kota, Phalombe and Salima. Part of Rumphi

(Nkhamanga Plain) also falls within this zone. Nkhata-Bay and Nkhota-kota are exception in this case as they receive much more rainfall than the rest in spite of its geographical locality in the zone. The agricultural population in the zone is about 0.8 million households.

The medium attitude zone covers Blantyre, Chiradzulu, Dowa, Kasungu, Lilongwe, Machinga, Mchinji, Mzimba and Zomba. It also covers parts of Chitipa and Dedza districts. The zone enjoys high average rainfall ranging from 800 - 1,200mm annually with an attitude of 1,000 to 1,500 metres above sea level. A part of this agro-ecological zone (referred to as Kasungu - Lilongwe Plain) is Malawi's breadbasket. The farming population is estimated at around 1.5 million households.

The high plateau and hilly areas lie in an attitude of over 1,500 above sea level and receive over 1,200mm of rainfall annually with low average temperatures. The population covered in the zone is approximately 0.8 million households. The zone covers such districts as Mulanje, Neno, Ntcheu, Thyolo and parts of parts of Chitipa (Misuku Hills), Viphya plateau, Mwanza and Rumphu (Nyika Plateau). Neno, Ntcheu and parts of Mwanza fall within the Kirk Range Highlands. Some types of crops for these areas are different from most of the other ecological zones and include Irish potatoes, wheat, coffee and tea.

In all these zones, farmers still grow maize as the main staple food crop although in some of these zones the growing conditions may not be the best. Other food crops grown mainly in the lower shire valley include sorghum and millet. Cassava and rice are dominant food crops grown in the lakeshore districts and some of the low-lying areas.

3.4 Agricultural Activities and Livelihood Systems

Rural livelihoods in Malawi, for all wealth groups depend to a significant degree on production and direct consumption of crops and livestock. Many households, including the poor, also derive incomes from growing and selling of cash, and food crops. Poor rural households in Malawi obtain 30-40 per cent of their income from 'off own farm' activities (Kydd, Dorward, Morrison & Cadisch, 2004). The majority of the Malawians in the three regions still derive their livelihood from agriculture (NSO, 1998). For instance, of the 6.8 million people aged 10 years and above, (4.5 million, 66%) are economically active in the agricultural sector`. The majority of the economically active population (78%) are subsistence farmers and the rest (13%) are employees.

Malawi Vulnerability Assessment Committee (MVAC) has grouped the country according to dominant livelihood systems. The baseline analysis in 2003 identified an aggregate of eighteen (18) livelihood zones across the country based on main sources of food and cash. The 18th zone covers areas which include major urban centres, national parks, nature reserves and other uninhabited areas such as mountains.

The types and production levels of food and other crops grown distinguish these zones. The southern part of Malawi, with an exception of the Lower Shire Valley, has a relatively lower per capita crop production than the other parts of centre and north. However, the south enjoys a more diverse crop regime than the centre and north which largely relies on maize as the main staple crop mainly in Kasungu / Lilongwe Plain and Western Rumphu & Mzimba. Cassava is a unique crop for Nkhata-Bay and Central Karonga zones. Being a crop less prone to water stress and also low input (including labour), it makes the people have relatively more food secure than their counterparts in other zones (SADC, 2007).

With respect to income sources, people in all zones are dependent on crop sales mainly tobacco, cotton and even food crops. Other sources of income are mainly sales of labour and other traded items mainly, inter alia, firewood, charcoal, carvings and mats. Tobacco is the major cash crops for the centre and north whilst cotton is for the Shire valley zone. The other unique zones are Thyolo / Mulanje Tea Estates and Southern Lakeshore whose cash generation stems from tea growing and fishing respectively. Those not able to grow tea and fish are able to sale their labour in the tea and fishing industries.

In addition to crop and fish farming, all the zones engage in livestock production which allows the 'middle and better off' households to generate

incomes. Some of the zones, e.g. Thyolo / Mulanje Tea Estates and Lower Shire Valley, benefit from their proximity to neighbouring countries (mainly Mozambique) which are sources of cheaper food. The most generic problem faced by all the zones is the low technology adoption that leads to low agricultural productivity (SADC, 2007).

4.0 The National Agricultural Research System

4.1 The Concept of NARS

The concept of a National Agricultural Research and Development System emerged in a number of developing and intermediate countries in the early 90's in order to adapt the prevailing paradigms and institutional set ups in agricultural research, to the emerging needs for a more efficient dissemination and adoption of research findings.

4.2 General Definition

A NARS has defined as an organized system mobilizing the contribution of stakeholders in agriculture. Typically, a NARS system would consist of:

- Research institutions (public, private and professional)
- Universities and professional training institutions
- Extension organizations
- Private companies and their organizations
- Non-Governmental Organization (NGO) and Civil Society Organization (CSO)

The basic principles of NARS are:

- A NARS operates for the development and use of research by the stakeholders.
- A NARS is governed by participatory bodies.
- A NARS is funded by governments and stakeholders.
- A NARS is planning research and development programs, evaluating the outputs of those programs.
- A NARS is supervising the development of international cooperation.
- A NARS should consider elements of Technology use, adoption, transfer and its impacts.

4.3 Recent Development of the NARS Concept in SADC

In September 2007, through the SCARDA project, stakeholders in Southern Africa further developed the NARS concept for the region; in order to support the promotion of the innovation systems which would mobilize all relevant stakeholders in the design, implementation and evaluation of research and development in agriculture. The participating institutions forming NARS should include policy, supply side, demand side, intermediary side and capacity building institutions that are linked to agricultural research output generation, delivery and utilization. The following definitions are used when referring to NARS:

- a) **Policy institutions:** Institutions that provide guidance on training and research. The policies give strategic direction to national priority areas in development efforts to which the NARS must contribute meaningfully.

- b) **Demand-side institutions:** Ultimate beneficiaries who utilize research and training outputs. These institutions also determine priority research and nature of impact expected.
- c) **Supply-side institutions:** Research institutions that generate research outputs.
- d) **Intermediary institutions:** Institutions that facilitate or enhance translations of research output (knowledge and technology). Depending on the situation, they can play the roles of demand side, supply side or advocates of both.
- e) **Capacity building institutions:** Institutions that build capacity for the whole NARS or for a category of institutions or stakeholders.

Therefore based on the definition and principles of NARS, Malawi has all the ingredients of an idle NARS although in a fragmented manner as explained below.

4.4 Institutional Framework of the NARS

Relevant ministries and departments for Agricultural Research and training:

- Ministry of Agriculture and Food Security
- Ministry of Education, Science and Technology
- Ministry of Energy and Mining
- Ministry of Lands and Natural Resources
- Ministry of Tourism, Wildlife and Culture
- Ministry of Economic Planning and Development
- Ministry of Irrigation and Water Development
- Ministry of Trade and Private Sector Development.

5.0 Policies for Research and Training in Agriculture

5.1 Relevant Policy Documents

From the policy documents gathered, it was noted that the MGDS was the prime policy of which the rest of the policies were supposed to be feeding into. However, there is a problem in that the old policies do not fit into the MGDS which is a current strategy highlighting actions of the future. Therefore, there is a need to review old policies so that they fit into the MGDS. Table 1 shows many policies currently in use and about 58% are overdue requiring a review to suit the current emerging users. These policies were developed during the period between 1987 and 2002 according to the prevailing conditions. What is critical is not only that the policies are overdue, but that most of the overarching policies have been formulated well after the sectoral policies were put in place. For example, the MGDS was developed in 2006 while the Crop Production and the Cooperative Development policies were developed in 1987 and 1997 respectively. The result is that the new thrust for development is not reflected in the policies being used.

Table 1: Years in which various policies were formulated and their overall goals

Policy/or other related Documents	Year	Overall Objective
1. Malawi Growth and Development Strategy	2006	To reduce poverty through sustained economic growth and infrastructure development
2. Food Security and Nutrition Policy	2005	To significantly improve the food and nutrition security of the population of Malawi
3. National Strategy for Sustainable Development	2004	Manage the environment responsibly, prevent degradation, provide a healthy life for all, protect the rights of future generations and conserve and enhance biological diversity
4. HIV/AIDS in the Agricultural Sector- Policy and Strategy 2003-8	2003	To mainstream HIV/AIDS and gender issues into all agricultural programmes and projects.
5. National Seed Policy	2003	To increase agricultural production and diversification
6. The Cooperative Development Policy	1997	To improve income levels and create employment opportunities.
7. National Research Policy	1995	To develop crops and livestock technologies that will promote increased crops and livestock production and to develop systematic and comprehensive information management system that will provide information on technologies that can be utilized by all farmers to solve technical problems
8. Crop Production Policy	1987	To promote increased and sustainable production of both food and cash crops to meet the country's requirements for food, foreign exchange and raising rural incomes while maintaining the productive potential of the land
9. National Environmental Policy	1994	To promote of sustainable social and economic development through the sound management of the environment in the country.

Policy/or other related Documents	Year	Overall Objective
10. Malawi National Land Policy	2002	To ensure tenure security and equitable access to land, to facilitate the attainment of social harmony and broad based social and economic development through optimum and ecologically balanced use of land and land based resources.
11. Trade Policy	1998	To transform the economy from a predominantly importing and consuming to a producing and exporting country thereby contributing significantly towards sustainable economic growth, job creation, empowerment of the locals, generation of competitive exports and harnessing of local resources.
12. Science and Technology Policy	2002	To attain sustainable socio-economic development through the development and application of science and technology in order to improve the standard and quality of life of Malawians.
13. Energy Policy		To meet national energy needs with increased efficiency and environmental sustainability

The MGDS highlights agriculture as the most important sector of the economy as it employs about 80 per cent of the workforce, and contributes over 80 per cent of foreign exchange earnings. Also it contributes significantly to national and household food security. However, Malawi continues to suffer from chronic food insecurity at both household and national levels with many of the problems being structural and economic in nature. In addition, past food security policies have been ineffective, resulting in stagnating aggregate food production and productivity, and poor functioning markets. The overall goal is, therefore, to increase agriculture's contribution to economic growth, by not only increasing production for food security, but also for agro-processing and manufacturing for both domestic and export markets. Emphasis will be on enhancing agricultural productivity, promoting food security and agro-processing of key crops. However capacity building/development is the key.

5.2 Research Policies in Agriculture and Natural Resources

The Malawi government recognizes the importance of research, science and technology in national socio-economic development. In this context, it has established national institutional structures that support the development of science and technology such as the National Research Council of Malawi (NRCM), Malawi Industrial Research and Technology Development Centre (MIRTDC) and a fully-fledged Department responsible for science and technology. Technology is generated through continuous research and development hence it calls for investment in research, technology development. However, despite these efforts,

Malawi is extremely weak not only in scientific and technological development but also in its utilization. This weakness affects many aspects of the socio-economic development. Integration of science and technology in the national development planning process continues to face a number of constraints. Some of these key constraints are; poor coordination of research, science and technology generation, weak institutional capacity, and inadequate funding to the relevant institutions (MGDS, 2006), lack of consistency in harmony in implementation of research policy.

Malawi's growth in agricultural output is increasingly becoming dependent on the development of scientific and technical capacity to develop new mechanical, chemical, and biological technologies. As such, growth in agricultural output, based on increases in cultivable land, is no longer possible. Farm inputs, including implements, fertilizers and pesticides have increasingly become expensive; hence, relatively inaccessible to the majority of the agriculturally-dependent resource poor smallholders. However, although research is seen as a priority but the issues of training are not clear and the MGDS highlights the promotion of appropriate agronomic practices through extension and training, as well as provision of training up to PhD level to the existing and to new staff. The policies that follow are highlighting issues to do with research and training:

5.3 Agriculture Policy

The overall government policy is to improve the well-being of Malawians through poverty alleviation, especially among rural people, by promoting broad-based and rapid agricultural development. This is stated in the Statement of Development Policies 1987-1996 and in the Agricultural and Livestock Strategy and Action Plan (1994).

The overall aim of rural poverty alleviation encompasses, among other objectives of Malawi's agriculture and livestock development which include:

- Improving food self-sufficiency and the nutritional status of the population
- Encouraging self-reliance through increased broad based small scale agro-industries and business
- Expanding and diversifying crops' and livestock products' exports
- Raising farm incomes and promoting economic growth while conserving natural resources

The policy objectives aim at minimizing:

- The deterioration of natural resources
- The serious disproportionate distribution of crops and livestock incomes
- The overdependence on volatile external trade flows

Consequently the agriculture policy is divided into the following areas:

5.4 Crop Research Policy

Research policy strongly emphasizes food self sufficiency rather than food security even though the latter is consistent with liberalized economic system. The emphasis on food self sufficiency in the policy statement is a characteristic of a subsistence economy, apparently assumes that Malawi is predominantly a producer of primary raw materials. The low priority accorded to mechanization and processing technologies in research is a clear evidence of the flawed sustainable development strategy. The failure to incorporate the value-added component in policy statements and action plans reduces the scope for improving the welfare of the people through increased revenue from exports of high value commodities and the creation of alternative employment opportunities (MANRRMP, 1999). Therefore, there is a need to review the crop research policy to cater for value addition to the crops Malawi produces in order to increase the people's income.

5.5 Livestock Research Policy

The National Livestock Development Master Plan (NLDMP) recognizes the poor problem analysis DARS, DAHI, DAES, NGOs at a farmer level and that past research has not paid attention to the needs of livestock owners (NLMD, 1988). It gives high priorities to improving disease control and improved husbandry at the farm level and increasing the feed supply to increase animal production. However, breeding is given low priority for all stock. Research for animal production by the estate sector is needed and better collaboration among and the University Colleges is imperative. Overall, there is little research in live stock primarily due to inadequate human and financial resources (MANRRMP, 1999). Malawi need to

adequately fund capacity building in livestock if the sector has to contribute to the country's GDP.

5.6 Fisheries Research Policy

The role and function of the research unit of the Department of Fisheries is to undertake relevant and problem-solving management oriented research programmes. The policy mandates whenever necessary to collaborate with local or external organisations generate usable information and technologies required for the management, conservation and sustainable utilisation of fisheries resources in the various water bodies of Malawi.

The Department of Fisheries (DoF) has a Fisheries College at Mpwepwe that stresses the importance of training as a method to develop and maintain skills in the public and private sectors of the fishing industry. This is what the SADC region policy goals of Human Resource Development (Training in Fisheries) Policy (NFAP, 1999).

Fisheries research focuses on two main areas of aquaculture and capture fisheries. The research objectives of aquaculture are to increase commercial fish farming among smallholders to improve household income and food security. This emphasizes on the improvement of productivity through selection and breeding for fast growth and high feed conversion and the management of fish ponds, dams and water reservoirs. The major objective of capture fisheries research is to increase

sustainable levels of fish landings through the improvement of fishery technology, management of large water bodies and harvesting techniques. In this respect, research focuses on: 1. development of appropriate fishing equipment and harvesting methods for deep water fishing; 2. taxonomy; 3. monitoring both deep and shallow water fishes; 4. development of community-based fish management practices; 5. environmental monitoring; 6. aquatic ecology on vulnerable habitats; 7. processing; 8. storage; and 9. inventory of fish species (MANRRMP, 1999).

5.7 Forestry Research Policy

Forestry resources are declining at a rapid rate due to a number of factors including: 1. increased demand for firewood for home consumption and agricultural uses; 2. timber for home and industrial uses; 3. lack of improved technology to enhance efficiency of utilization; and 4. land for agriculture use. The supply of forest resources is also constrained by low productivity resulting from poor genetic performance of current species, poor management and lack of incentive to invest in forestry production. The overall objective of forestry research is to optimize tree productivity on farm, woodlots, plantations and woodlands in order to enhance the contribution of trees and forests to the economy of Malawi. Specifically, forestry research aims at: 1. providing technical and social forestry solutions to problems communities encounter in daily lives; 2. establishing methods and generating knowledge for advancing forestry science; 3. providing leadership in forestry sector development, and 4. contributing towards a scientific culture. These objectives will be achieved by undertaking well designed

and relevant research, whenever necessary jointly with other national and international institutions in areas such as: - 1. plantations; 2. trees on the farm; 3. indigenous woodlands; and 4. seed development (MANRRMP, 1999).

5.8 Funding Research in Malawi

Funding for research in Malawi has been unstable and inadequate. This has detrimental effects on the morale of scientists and quality of research. In most cases, funds from donors have been forthcoming but with little or no counterpart funding making the funding mechanism unsustainable. However, the government now appears to recognise the crucial role research plays in promoting productivity of agriculture and natural resources for the country's socioeconomic growth, although this is not currently being translated into a budget priority. Since poverty alleviation is being regarded as high priority on its development agenda, it is hoped that the budget for agricultural and natural resources research will be increased as a worthwhile investment in relation to other demands on government funds (MANRRMP, 1999). Since 1999 the budget for agricultural and natural resources research has not been increased. Perhaps this is an area where ICART can play a role by lobbying with SADC governments to allocate more funds for research and training.

5.9 Weak Institutional Framework for Policy formulation, implementation Coordination, Monitoring and Evaluation

The institutional framework for formulation, implementation, coordination, monitoring and evaluation of the policies is presently at sectoral ministry or departmental level. The linkages between ministries or departments are generally weak as each institution acts independently of the other. This is evidenced by the multiplicity of policies and strategies, which are often repetitious, overlapping and uncoordinated in their implementation across the sectors or departments (PAA, 2007). The policies analysed are coordinated by different institutions as outlined in the Table 2 below.

Table 2: Agencies with key responsibilities over policies

Policy or related Document	Responsible Ministry/Department
Malawi Growth and Development Strategy	Ministry of Economic Planning and Development
National Strategy for Sustainable Development	
Food and Nutrition Security Policy	Ministry of Agriculture and Food Security
HIV/AIDS in the Agricultural Sector- Policy and Strategy 2003-8	
National Seed Policy	
National Research Policy	
Crop Production Policy	
Pesticides Act	
Fertiliser Act	
Micro and Small Enterprise Policy	Ministry of Trade and Private Sector Development
The Cooperative Development Policy / Farmer organization Development Policy	Ministry of Gender, Child Welfare and Community Services
National Gender Policy	Ministry of Local Government and Rural Development

From the Table 2 above, it is clear that for efficient and effective implementation coordination of activities five different agencies must dialogue and combines efforts in a coordinated manner to achieve the outcomes of the set objectives.

This lack of coordination has led to duplication/overlaps of strategies with no clear understanding of who is responsible for a particular policy issue. This makes monitoring of progress very difficult. The weak and unclear implementation approaches makes it difficult to appreciate clear outcomes of the set objectives.

6.0 Registered Institutions / Organizations Delivering High Level Training and In-service Training in Agriculture Natural Resources

Malawi has a number of institutions which deliver high level and in-service training ranging from certificate to PhD (Table 3). However, it should be mentioned these institutions are inadequately funded as a result human capacity is still a problem both in research and extension.

Table 3: Institutions / organizations delivering high level training and in-service training in agriculture and natural resources in Malawi

Name of institution	Type of institution	Highest level offered
University of Malawi	Public	PhD
Mzuzu University	Public	BSc.
Natural Resources College	Semi - Public	Diploma
Malawi College of Forestry and Wildlife	Public	Diploma
Agriculture and Research Extension Trust (ARET)	Semi - Public	Certificate
Mikolongwe College of Veterinary	Semi - Public	Diploma
Mpwepwe College of Fisheries	Public	Diploma

6.1 Public Sector Institutions in Research and Training

The Ministry of Agriculture and Food Security is most prominent in technology dissemination and extension service delivery to the smallholder farmers. Five of its other technical departments namely Agricultural Extension Services, Crop Production, Land Resource Conservation, Fisheries and Animal Health and Livestock Development execute this mandate.

- a) **The Department of Crop Production (DCP)** is responsible for promoting appropriate crop production technologies in order to improve crop productivity and subsequently food security and raising incomes of farmers. Within this mandate the Department oversees aspects of crop diversification, disease and pest control (pre and post harvest), and farm mechanization. The department is instrumental in improving the availability of the improved seed supplies by promoting seed multiplication programmes.

- b) **The Department of Land Resources Conservation (DLRC)** is focused on promoting efficient and diversified services dealing with environmental conservation to ensure that land based resources are utilized in a sustainable manner. Thus, key working areas cover land resources planning, information provision and land use monitoring and evaluation. Its main strategic actions include promoting development of conservation structures, conservation farming and agro-forestry.

- c) **The Department of Fisheries (DoF)** is focused at maximizing the sustainable economic yield of stocks in natural and man-made waters. Its secondary objectives are geared towards improving the efficiency of exploitation, processing and marketing and to promote investment in rural fish farming units. The strategies emphasize research to identify under-utilized fish resources especially in the offshore waters of Lake Malawi, as

well as the promotion of aquaculture development particularly in the Central and Northern regions of Malawi. Of late research activities have increased; Salima and Monkey Bay Stations have also started executing research activities.

- d) **The Department of Animal Health and Livestock Development (DAHLD)** spearheads work aimed at promoting sustainable livestock development in Malawi. It addresses aspects of animal production, pests and disease control, and inspectorate services. The Department has for a long time been running livestock centres across the country where breeding work has taken place. However, operations of the centres have suffered from limited funds availability in the absence of donor funding support. The Department has initiated innovative means of spreading its operations to the end users by promoting farmer-led technical services. Such a system has resulted to study breeding, drug administration, artificial insemination, pregnancy diagnosis and heat detection services being transferred to community-managed.

- e) **The Department of Agricultural Extension Services (DAES)** is the main conduit for the dissemination of all technologies going to the smallholder farmers, regardless of its source of origin. In its mandate it ensures that agricultural extension services are provided in partnership with other service providers. The current extension policy places emphasis on aspects

of demand-driven and pluralistic nature of service provision. In order to be effective, the Department has a number of specialized units which deal with: extension methodologies and systems, communication, gender and HIV/AIDS mainstreaming in agriculture, food and nutrition and agribusiness development. The innovative approaches to service delivery have been well embraced by the Department as evident from such approaches as farmer to farmer extension, model village for total transformation, decentralization of extension service delivery to the district level (with comprehensive extension structures being put in place), mainstreaming gender and HIV/AIDS into the work place. One of the critical issues addressed by the decentralization move is fostering coordination of service providers at the district level whilst at the same time ensuring that farmers have a say in the services needed and their sources. The department closely works with other departments which generate the technologies and provide technical and advisory services.

- f) **The Department of Irrigation Services (DIS)**, within the Ministry of Irrigation and Water Development but previously part of Ministry of Agriculture, plays a key role in disseminating irrigation technologies to the smallholder farmers. Its mandate is to develop land and water resources for irrigation. The department is promoting a number of irrigation technologies such as gravity-fed river diversion, treadle pumps and watering cans (as manual water lifting devices), motorized pumps, and canalization.

Recently, it has played a key role in developing farmer associations/cooperatives as a step towards promoting sustainable irrigation management by the communities.

- g) The Agricultural Research and Extension Trust (ARET)** plays a crucial role in dissemination of technologies on tobacco. It is now the sole body championing this work for both large and small scale farmers. It would be stated that through dealing with both technology generation and dissemination, ARET is in better position to ensure that what gets developed is seen through the farmers. Nonetheless, by covering both estates and smallholders, the organization is seriously challenged on its capacity.
- h) Bunda College (BC)** plays a major role in generation, dissemination of technologies. In its three faculties: agriculture, environment and developmental studies, a lot of research and training has been undergoing since the establishment of the institution.

6.2 Parastatal or Semi-public Institutions in Research and Training

A number of parastatal or semi-public institutions are involved in research, training and dissemination of technologies on specific commodities. For instance, the Dwangwa Cane Growers Trust disseminates sugarcane production of technologies to smallholder farmer sugarcane production. Likewise, the

Smallholder Tea and coffee Authorities carry out similar activities for tea and coffee to smallholder growers respectively.

Universities and training organizations

The University of Malawi through its constituent colleges conduct research and training. These are Bunda College, Chancellor College and the Polytechnic. Mzuzu University is also actively involved in training and research.

6.3 Private Sector Research Institutions

There a number of seed companies undertaking research and technology generation in Malawi for commercial purposes. These work with the National Agricultural Research Systems in most of their activities although some of their technologies are imported. These companies are mainly working on maize varieties although some have extended to other crops. Seed Company (Malawi) Limited, is one private company undertaking research in seeds and marketing. Its mandate in collaboration DARS scientists does agronomic trials before a variety is released by the Agricultural Technology Release Clearance Committee (ATCC).

6.4 International Research Institutions

Most of the CGIAR centers currently operate in Malawi; these include International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), International Centre for Tropical Agriculture (CIAT), International Centre for Research in Agroforestry

(ICRAF) [World Agroforestry Centre], International Institute of Tropical Agriculture (IITA)/Southern Africa Research on Roots and Tubers Network (SARRNET), Center for Maize and Wheat Improvement (CYMMIT) and World Fish Center (WFC). Each of these CGIAR institutions plays a key role in promoting technology development by closely collaborating with the national agricultural research system. Their main mandates are described below:

6.4.1 ICRISAT

The International Crops Research Institute for the Semi-Arid Tropics is one of the international agricultural research centres based in Malawi. With its focus on the semi-arid tropics, in Africa ICRISAT has staff based in Kenya, Mali, Mozambique, Niger and Zimbabwe, in addition to Malawi. The overall aim of ICRISAT is to alleviate hunger and poverty through agricultural development, focusing research on crops, farming systems and income opportunities for poor farmers in semi-dry areas.

ICRISAT has been at Chitedze Research Station since 1982 primarily conducting research on groundnuts and pigeon peas in collaboration with SADC NARS. More recently, ICRISAT activities in Malawi have shifted focus from primarily working with the development of crop varieties with higher yields and improved resistance to diseases and pests, towards a more market-oriented approach to agricultural development. At the same time, new partnerships have been established with farmers' organisations, especially with NASFAM, but also extending their collaborative links to other NGOs.

Key components in ICRISAT's present approach are the identification of high-value market opportunities, focusing on varieties that appeal to final consumers, establishing more direct market linkages from small-scale farmers, through farmers' organisations to high-quality/ high-value buyers. The present model of improving the livelihoods of smallholder farmers has also been supported by USAID.

6.4.2 ICRAF (World Agroforestry Centre)

Its vision is an '*agroforestry transformation*' in the developing world resulting in a massive increase in the use of working trees on working landscapes by smallholder rural households that helps ensure security in food, nutrition, income, health, shelter and energy and a regenerated environment. ICRAF use science to generate knowledge on the complex role of trees in livelihoods and the environment, and foster use of this knowledge to improve decisions and practices impacting on the poor (<http://www.icraf.cgiar.org/Ourcentre.asp>). In Malawi, it has pursued the mandate of agroforestry technologies development. In its work, seeks to promote soil fertility improvement, livestock fodder supply, woodlot establishment and domestication of indigenous fruits.

6.4.3 IITA/SARRNET

International Institute of Tropical Agriculture (IITA) - was established in 1967. With headquarters in Nigeria, it was the first African link with the international network of agricultural research centres supported by CGIAR. Its specific mandate has been to improve food production in the humid tropics. Research has focused on food crops such as: cassava, plantain and banana, yam, maize, soybean, and cowpea. At the international level, IITA has designed a general project with particular relevance for Malawi called: Promoting food security and income generation through sustainable production and commercialization of starchy and grain staples in eastern and southern Africa. Under this project, IITA Malawi has worked with a number of special (sub) projects. These include initiatives and projects aimed at:

- expanding the use of cassava starch
- promoting commercially viable small- and medium-scale enterprises using cassava as a raw material
- disseminating genetic material targeting both production systems and market opportunities
- root crops and banana/plantain improvement

Among IITA partners, funding sources and collaborators necessary to carry out these initiatives are DARS (at Chitedze), USAID, and SARRNET.

SARRNET - the Southern African Root Crops Research Network - is a network/project launched in 1993, with IITA as the institution responsible for coordination of the network and executing the project. SARRNET activities focus on cassava and sweet potato as principal crops, with CIP. Nairobi as a professional back-stopper on sweet potato. The project activities are oriented towards applied and participatory research and development initiatives; including demand-led processing and utilisation (<http://www.iita.org/sarrnet/sarrnet/asanet.htm>). The focus on cassava and sweet potato is motivated by the fact that both crops have over the years been regarded as low value and low status crops with little potential in the field of agricultural development. SARRNET is promoting these crops through research and dissemination of technologies to stakeholders. At present, SARRNET is coordinated from the IITA offices at Chitedze Research Station. Eleven SADC countries are part of the SARRNET network in addition to Malawi.

6.4.4 CIAT

The International Centre for Tropical Agriculture (CIAT) whose mandate is to conduct research on bean to help rural communities in the region build sustainable livelihoods. It does this by fostering strong, mutually beneficial relationships among national research institutions, non-government organisations, the private sector and, most importantly, farmers themselves. Major areas of concentration include technology generation for soil fertility improvement as well as undertaking social research geared towards empowerment of farmer groups and local

institutions to develop agro-enterprises that would transform rural peoples' livelihoods. Seed marketing has also received support from the organization (www.ciat.cgiar.org/africa/ciat_africa.htm).

7.0 Coordination of the NARS

A NARS is an organized system mobilizing the contribution of stakeholders in agriculture. The major player for coordination is the Ministry of Agriculture and Food Security through the Department of Agriculture Research Services.

Research institutional (public, private and professional), universities and professional training institutions, extension organizations, private companies and their organizations, Non-Governmental Organization (NGO) and Civil Society Organisations (CSO)

A NARS should do the following:

- A NARS operates for the development and use of research by the stakeholders.
- A NARS is governed by participatory bodies.
- A NARS is funded by governments and stakeholders.
- A NARS is planning research and development programs, evaluating the outputs of those programs.
- A NARS is supervising the development of international cooperation.

7.1 Formal Existence and the Monitoring Mechanisms and the Contribution of Research to Stakeholders of NARS

Monitoring and evaluation (M&E) as a management tools which provide effective means of reviewing the progress of research programme to ensure that the activities are carried out according to stated goals and objectives. M&E also provides feedback for potential deviations of research programmes from planned action before the activities go out of hand. In this way, priorities may be reviewed and future research directed to meet desired objectives. However, the stakeholders play a big role in the M&E e.g. the annual research conferences in which research results dissemination is done.

In the ministry of Agriculture and Food Security a systematic procedure for M&E exists in the DARS and this is used during the planning, implementation and reporting of research priorities. The monitoring and evaluation is composed of members of the Agriculture Research Council (ARC). The ARC was established to set guidelines within which policy DARS has to operate.

Functions of the ARC:

1. Ensure the agricultural research strategy is consistent with national agricultural development goals;
2. Outline an agricultural research policy that is compatible with and supportive of national goals;
3. Approve annual research programmes and projects for implementation by DARS;
4. Consider and recommend contract research proposals, including the level of funding;
5. Recommend an appropriate level of expenditure in agricultural research, with the target of eventually investing at least one percent of the annual value of the gross domestic product (GDP), and
6. Prepare the Agricultural Research Master Plan which allocates priorities according to national goals.

The composition of the ARC

The original ARC attempted to fulfill its mandate and to carry out its functions. However, it failed to be effective probably because, among other things, its chairperson was looked upon as an outsider and also because there is no permanent secretariat to run day- to - day affairs.

The ARC is composed of the following:

Chairperson : Elected amongst the members

Alternate : Elected by members

Secretary : Director of Agricultural Research

Member : Principal Secretary for the Treasury

Member : Representative of NGOs (CONGOMA)

Member : Principal Secretary for Forestry / Natural Resources

Member : Representative of the University of Malawi

Member : Representative of Agricultural Research and Extension Trust (ARET)

Member : Representative from Pesticides Association of Malawi (POSAM)

Member : Representative from Tea Research Foundation (TRF)

Member : Representative of smallholder Farmers

Member : Director of Animal Health and Livestock Development

Member : Director of Planning

Member : Director of Fisheries

Member : Director of Agriculture and Extension Services

Member : 2 eminent scientists

7.2 Institutional Chart

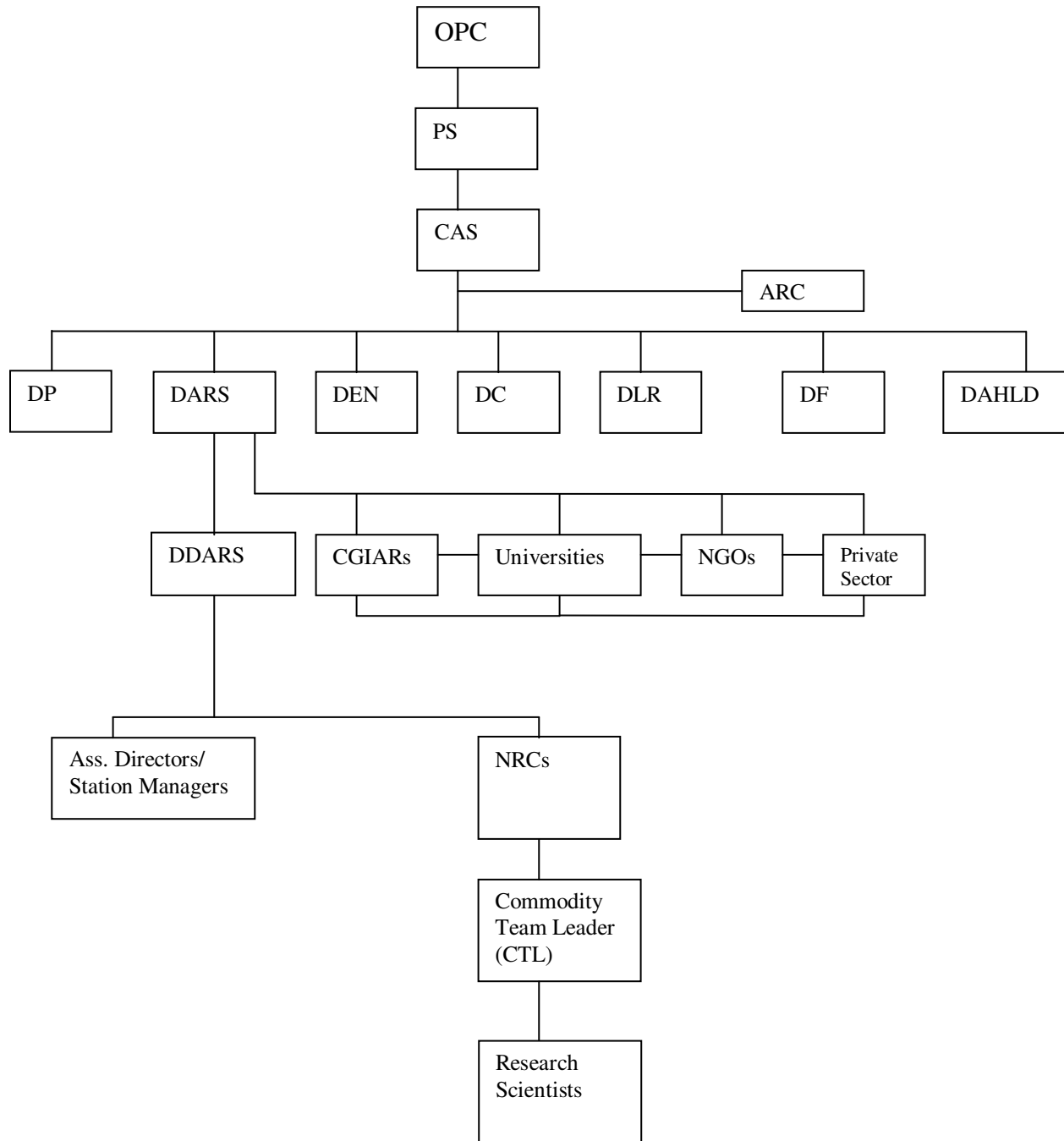


Figure 1: Ministry of Agriculture and Food Security organogram linked to the Office of the President and Cabinet (OPC).

Key

DP = Department of Planning, DEN = Department of Extension, DC = Department of Crops, DLR = Department of Land Resources, DOF = Department of Fisheries, DAHLD = Department of Animal Health and Livestock Development, OPC = Office of the President and Cabinet.

All the ministries which play part in the NARS met at the Office of the President Cabinet (OPC). The weak linkages among the ministries lead to duplication of policies and wasteful use of the meager resources.

7.3 Roles and Research Needs of Private Sector Organizations

There are many private sector organisations in Malawi. But, unfortunately they play a very minor role in research needs identification and yet they are the beneficiaries. It is therefore, necessary that:

- There should be an encouragement to NGOs to participate in research and training. E.g. NASFAM training farmers and not its own staff.
- These organizations are in direct contact with the farmers; hence they know the needs of these people.
- The objectives of the private sector organization should be aligned to the research national needs.
- Most of these take research as expensive and not in their budgets, though the need might be there from the stakeholders.

7.4 Working Methodologies of Research/ NARS

Malawi still follows traditional working methodologies of research. An individual scientist conceptualizes a problem from literature, or through interaction with farmers. Subsequently, the scientist either starts with laboratory or field work

depending on the nature of the problem and manually experiments have to run for three seasons before the results are recommended to the ATCC for approval before releasing them to the farmers.

However participatory approaches in some cases have been used to develop research agenda.

8.0 Potential Demand for Cooperative Relationships between Research and Training Institutions, Farmers' Organizations and Private Sector

Currently most research institutions organize field days, demonstrations plots where stakeholders are invited to participate in order to get feedback about the appropriateness of the generated technologies.

Through these institutions farmers organizations such as NASFAM, FUM, and private sector as well as the farmers demand the type of the research they want to solve their problems. Unlike the Ministry of Agriculture and Food Security where research and extension are two different departments, ARET and TRF the two sections are under one directorate with two heads of sections responsible for research and extension respectively. The advantage of the ARET and TRF system is that there is constant contact among researchers, extensionists, growers and the bureaucracy is reduced. While as in the Ministry the linkage between research and

extension department is through the Controller of Agricultural Services (CAS) which, in most cases, is weak.

9.0 Best Practices for Cooperative Relationships between Stakeholders for Developing Training in Agriculture for the SADC Region.

Consultative Group on International Agricultural Research (CGIARs) have a regional focus and generate a pool of probable technologies which can be tapped from. Another regional group which SADC emulate is the RUFORUM which supports both collaborative research and capacity building (Training). Twelve universities in different countries have for a cooperation relationship to train young men and women in agricultural and natural resources at MSc. and PhD levels. Graduates produced through this programme are ready in responding to national and regional problems. In the development of programmes, first there is the involvement of stakeholders. The use of model villages as an entry point for technologies, are used in the ARDEP projects. ARET and TRF are two examples of successful private sectors which support research and training institutions.

10.0 Networking for Agricultural Research, Training and Development

10.1 Appraisal of In- country Research Alliances

Agriculture research in Malawi is conducted by several institutions which are weakly linked as a result there is a lot of duplication and waste of scarce resources. The National Research Council of Malawi currently in the Ministry of Education, Science and Technology is mandated by the Presidential decree to coordinate all research in Malawi. However, due to a number of constraints including inadequate financial and human resources, weak linkages with other institutions it is not effective in terms of coordination. What is happening currently is that institutions interact informally mostly on personal level.

The following institutions actively conduct research in the country:

1. University of Malawi

Three institutions under the general administration of the University of Malawi conduct research directly connected to crops, livestock and rural development. These are Bunda College of Agriculture, Chancellor College, the polytechnic and Center for Social Research. The university has been the major beneficiary of DARS's contract Research Programme under NARP. Several research contracts were awarded to university scientists. These were on indigenous fruits and vegetables, milk production in goats and sheep, mealy bug on cassava, estimation of farm enterprise budgets. The involvement of the

university as a direct research support organization to DARS makes very effective use of Malawi's human resources.

Bunda College of Agriculture

About 90% of the scientists employed in the DARS, have been trained at Bunda College. The college has the mandate of doing some research work on the common bean i.e. diseases and insect control, intercropping patterns and culinary aspects. Through research programmes with DARS, scientists at Bunda College tap upon financial, physical and human resources of DARS. Apart from research on common beans, scientists at Bunda College collaborate with DARS on general food legumes; vegetables, livestock/pastures research and the nutritional evaluation of livestock feeds. All research on pigs/swine is carried out by Bunda.

Bunda College has an Agriculture Policy Research Unit (APRU) which was established in 1994 under Centre for Agricultural Research and Development (CARD). The United States Agency for International Development (USAID) provided the initial financial support through the Agricultural Sector Assistance Program (ASAP) in consultation with the University of Malawi. APRU was established to enhance the performance of the agricultural sector through conducting policy oriented and collaborative research. The type of research conducted ranges from short, medium and long term. Other complementary functions are training, outreach and documentation.

A number of research reports have been published as products of these various studies, such as briefing papers, policy briefs, working papers and other miscellaneous publications and are deposited at its documentation Unit.

The Unit has also been involved in the development of Malawi Agriculture Sector Investment Programme (MASIP) which is aimed at co-ordinating and prioritizing the efforts and investment funding of all stakeholders, public and private sector, in the agricultural sector (http://www.bunda.unima.mw/research_unit.htm).

Chancellor College and the Polytechnic

The departments of Biology and Chemistry at Chancellor College have been working together with DARS scientists on cassava mealy bug, soil pests and cassava detoxification projects. The center for Social Research has been utilized in carrying out social research related to agricultural and rural development. The Polytechnic is involved in development of farm equipment.

2. The Agriculture Research and Extension Trust (ARET)

Tobacco is the biggest foreign exchange earner for Malawi. Research on the crop was originally done by DARS at Chitedze and Mwimba Research stations. The government decided to create a statutory institute to focus on tobacco research requirement which later became a private institute known as Tobacco Research Institute of Malawi (TRIM). TRIM also co-operated with DARS on Agro-forestry research activities and the use of DARS facilities for soil analysis. Early 1995, TRIM

and a sister body, the Estate Extension Service Trust, merged to form one organization called the Agriculture Research and Extension Trust (ARET). The trust will continue to conduct research on all types of tobacco and to provide extension services to the estate sector. It is envisaged that ARET will co-operate with DARS in its efforts to promote crop diversification on the estates. The principal Secretary for Agriculture and Food Security is a Board member of ARET.

3. Tea Research Foundation of Central Africa (TRF)

The Tea Research Foundation of Central Africa (TRF) is one of the oldest research institutions in Malawi as well as southern Africa and Tanzania. The organization conducts all research on tea for Malawi. Though privately owned and funded, the results of research work on tea are made available to smallholder farmers growing tea. Interaction with TRF has been through the award of research contracts and representation on the Board of TRF and also the representation of TRF on several committees of DARS. For example, TRF was awarded a contract by DARS to establish a coffee research facility to determine a sound basis for improvements in both estate smallholder farming sectors. The coffee contract research has so far been the largest single project awarded by DARS. DARS also awarded a contract to the TRF on irrigation research project for tea plantations. The scientists working on coffee at TRF form part of the national coffee research team. DARS staff are occasionally seconded to TRF to work together with TRF staff. TRF has maintained itself as a relatively small organization, but well-established and advanced in its research activities.

4. Department of Animal Health and Livestock Development

The department provides veterinary services to the smallholder farmer, carries out research on animal diseases and also engaged in livestock production and marketing. Since DARS also carries research on livestock, co-ordination with this department is necessary for better planning of activities pertaining to livestock to avoid duplication in livestock research. DARS and the Department of Animal Health and Livestock Department are frequently represented on each other's committees that relate to livestock research and development in general.

5. Forestry Research Institute of Malawi (FRIM)

The Forestry Research Institute of Malawi (FRIM) is under the Ministry of Lands and Natural Resources and it concentrates its research on forestry. DARTS' Agroforestry Commodity Team Leader collaborates with FRIM on various activities.

6. Sugar Research

Research on sugar is conducted by Sugar Corporation of Malawi (SUCOMA) and Dwangwa Sugar Corporation (DWASCO) under the Illovo group of companies. Interaction with DARTS is mostly during introduction of new varieties where DARTS' quarantine facilities are used. A quarantine facility at Bvumbwe Research Station has been funded by SUCOMA.

7. The Department of Agricultural Extension Services (DAES)

DARS' researchers collaborate with DAES in conducting on-farm testing and adoptions trials of technologies developed at research stations. In this way, DARS' scientists are able to identify, on the spot, hitherto unknown technical and socio-economic problems faced by farmers. This helps the scientists to define farmers' problems more precisely and to refocus their research programmes accordingly. Furthermore, this approach accords DARS' scientists with the opportunity to directly interact with farmers thereby strengthening the farmer-extension-researcher linkages. DAES is also an active member of many committees in DARS.

8. The Food and Nutrition Unit

The food and nutrition unit was established within the Ministry of Agriculture and Food Security to serve as a supporting and complementary service to all agricultural services. DARS collaborate with the unit in areas of processing, utilization and storage of food, fish and livestock products.

9. The Department of Irrigation

This department is within the Ministry of Irrigation and Water Development. DARS interacts with this department in the development of irrigation-based technologies.

10. The Planning Division

This division falls under the umbrella of the Ministry of Economic Planning and Development. The planning division in the Ministry of Agriculture and Food Security is responsible for collecting data on Malawi's agricultural sector for planning purposes. The DARS interacts with this division in tapping on these data for planning purposes. In addition, DARS utilizes this division in the formulation of projects for funding.

11. Parastatal Organizations

Parastatals play an important role in the development of the nation. There are about 35 commercial, quasi-commercial and subverted parastatals involved in crops and livestock. DARS interacts, for example, with the Agricultural Development and Marketing Corporation (ADMARC) on crops such as cashew nuts, macadamia nuts, vegetables and fruits; the Malawi Export and Promotion Council (MEPC) on various exportable crops and also works closely with MEPC on the current crop diversification programme; the Tobacco Control Commission (TCC) on tobacco inspection at the Auction Floors; the Smallholder Coffee Authority (SCA) on coffee; the Tree Nut Authority (TNA) on macadamia and cashew.

Some coffee research is currently being conducted on Smallholder Coffee Authority demonstration farms with SCA support. DARS also collaborates with the Malawi Bureau of Standards in testing of oils, pesticides and other agricultural

products to ensure the expectation of high quality produce and the importation of materials of acceptable quality.

12. The private sector

The private sector in Malawi is getting more attention because of its role in the country's economy. Most private institutions are deeply involved in manufacturing or processing of agricultural products; field production and handling of specific crops; and the provision of chemicals used on crops and livestock. The DARS interacts with these groups to ensure that safe and efficient technologies are being transferred to farmers and that farmers are using the appropriate inputs from manufacturers. Example of such interaction include:

a. Processing and Manufacturing

There is collaboration with Unilever South East Africa in testing groundnuts varieties for oil, testing and manufacturing of farm implements such as ox-carts, ploughs and dehullers with Agriculture Implements of Malawi (AGRIMAL); evaluating of new varieties of vegetables and fruits with the Mulanje Canning Factory.

b. Direct production of crops

DARS directly interacts with estates involved in macadamia and coffee estates where experiments are being conducted on the farms.

c. Chemical Companies

DARS is responsible for testing and recommending safe and effective use of chemicals and spraying equipments.

d. Importers of Seeds and other Planting Materials

All seed retailed by the seed companies in Malawi are tested for viability by DARS' Seed Service Commodity Team. DARS ensures that all imported plant materials are accompanied by a valid import permit (Phytosanitary certificate). Collaboration with importers such as Pannar Seed Company, MONSANTO Malawi, Seed Co, Unilever South East Africa and Agricultural Trading Company (ATC) has enhanced the availability of viable seeds of recommended cultivars of vegetable seeds and other planting materials.

13. UNDP 5th Cycle Country programme/FAO Supported Research Programmes

UNDP 5th Cycle Country programme/FAO are funding some seed multiplication, crop improvement and cultural practices programmes in crops such as coffee, cassava, vegetable seeds and pigeon peas. The programmes are executed by DARS scientists. Also DARS scientists link with UNDP/FAO through fellowships.

The Agricultural Development Programme (ADP) just like ARDEP involves many stakeholders in the implementation of its programmes which is a Sector Wide Approach (SWAP) and is a framework with pillars implementing Malawi Growth

Development Strategy (MGDS). ARDEP came as a technology generation and dissemination programme into the focus areas of the ADP (ARDEP, 2007).

In Malawi, a lot of research alliances have been formed for example: the Agricultural Research and Development Programme (ARDEP) which is a 5-year Norwegian funded national programme coordinated at Bunda College. The programme is governed and managed by national governance structures such as the ARDEP Board (APB) and the Technical Committee called ARDEP Management Group (AMG) composed of various stakeholders in Malawi and Norway. Various stakeholders in Malawi, Norway and other organizations/institutions are implementing the programme. The overall goal of the programme is to reduce poverty and vulnerability amongst the poorest groups and improve quality of life and social well being of Malawians through a powerful, effective, and efficient national research and outreach system for the agricultural sector of Malawi (ARDEP, 2007). In this alliance three partners are key players: research institution, extension and an NGO.

The programme has a competitive grant scheme (CGS) that will be funding projects in agriculture, natural resources and related fields to contribute to sustainable development in Malawi. Under this scheme, the programme has already funded 8 projects in 5 sites (EPAS) in 4 Agricultural Development Divisions (ADDs) in Malawi. It is expected that the programme will further support another 14-16 projects in 2008 (ARDEP, 2007).

In most of the CGIAR centers in Malawi there have been a lot of research alliances. These research alliances involve these centers coordinating with various stakeholders who includes: the university, relevant ministries and the local farmer/people. The National research Council of Malawi gives grants based on the alliances as compared to individual scientists.

10.2 Research Alliance across the SADC Region

Establishing viable, functional partnerships and linkages mechanisms promotes maximum exploitation of research resources and strengthens individual members of the partnership for research delivery. This is the fundamental basis of the concept of collaboration in research networking, which has been successfully organized in Africa agricultural research institutions. However, research networking in African NARS is mainly donor driven and not initiated or sustained from national or sub regional resources or through non-donor supported programmes (FARA, 2006).

Evidence from Burkina Faso shows that where collaboration and partnerships between INERA (the national agricultural research institute) and FBOs are strong, through the donor-dependent PTD model, agricultural technologies generated are particularly relevant to the problems of farmers, who play a major role in the effective dissemination of agricultural technologies to support increased and sustainable food and agricultural production.

Close to 60 MSc students from the Departments of Crop Science and Rural Development at BCA have benefited both from grants and from practical support to students' research work provided through the FORUM programme (FORUM 2002). The programme has organised a number of regional workshops, where research proposals, and later on findings, have been presented and discussed. This initiative has been seen as useful both by students and staff. Bunda staff have also benefited from the programme through the opportunities provided for lecturers to get involved in projects that result in publications - since publications play a crucial role in individual staff's careers and advancement within an academic institution like BCA.

The FORUM programme has its coordination function located at Makerere University in Uganda. At present the whole programme is now called RUFORUM after undergoing through a phase of restructuring, aiming to leave the administration to the regional stakeholders - which in this case means the Universities and University Departments in East and Southern Africa that have been involved in the programme (Kaarhus, 2004).

The Southern Africa Network for Biosciences hosted by the Council for Scientific and Industrial Research (CSIR) in the Republic of South Africa. The network will cover 12 countries in the sub-region: Angola, Botswana, Malawi, Mauritius, Mozambique, Namibia, Lesotho, Swaziland, Seychelles, Republic of South Africa, Zambia and Zimbabwe. The Southern Africa Network for Biosciences (SANBio) Fish

Node housed in the National Research Council of Malawi (NRCM) which is mandated to look at the biodiversity of inland freshwater fishes in the region affected by anthropogenic activities which include over fishing and habitat destruction.

10.3 Cooperation with Foreign/ International Research Institutions

The DARS maintains good contacts with other research institution outside the country. Individual commodity groups continue to benefit from such contacts in terms of obtaining genetic materials, information and training programmes from IARCs that come under the umbrella of Consultative Group on International Agriculture Research (CGIAR). Examples of such collaboration are with CIMMYT on maize and wheat; ICRISAT on groundnuts, sorghum, millet and pigeon peas; IRRI on rice; AVRDC on vegetables; IITA on cassava and sweet potatoes; CIP on potatoes; CIAT on Beans; ILRI on livestock and pastures; ICRAF on Agroforestry and World Fish Center on fish. Some of these international institutions, such as ICRISAT, CIAT, ICRAF and IITA, have their regional and zonal centers in Malawi. This has further strengthened the interaction between DARS and these international centers.

There are three SROs in the Sub-Saharan Africa (CORAF/WECARD, ASARECA and SADC-FANR), which are founding members of FARA. These were created to serve as continental mouth-piece and apex regional organization on agricultural research for development. FARA facilitates an accelerated and even growth in the agriculture - led economies of the sub-regions under the three SROs. At present,

there is no SRO similar to CORAF/WECARD or ASARECA in the SADC region, just a department within a regional economic community. However, a Regional Indicative Strategic Development Plan (RISDP), drawn up in 2004, recognized the need for regional coordination of agricultural research and a thorough review of SADC's agricultural research is planned for 2006.

11.0 Discussion

The number of ministries involved in agriculture research and training are several. Largely this is because Malawi's economy is agro-based with emphasis of achieving food security. Consequently, a number of policies related to agriculture and natural resources research have been developed. However, these many of these policies are not linked to the MGDS, which is currently the prime policy of the land. The sectoral policies are not linked to the MGDS largely because were formulated before it came in place. Implementation most of these policies has been a problem because the funding of research activities has been unstable and inadequate. Hence the morale of the scientists and quality of research are low.

Public institutions offer higher level training in agriculture are obviously due to the nature of the economy which depends primarily on crops such as tobacco, sugar, tea and coffee. To some extent the government is complimented by some private and international institutions.

Monitoring and evaluation is available within the NARS. This has worked effectively in the projects implemented by the DARS. This might have been successful due to the nature and the make up the M&E system which comprise members of the ARC. The composition of the ARC composes of experts from different departments of the government and the private sector. In the identification of roles and research needs of the private sector, it was found that all players in the value chain should take an active role. This should not be left to the smallholder farmers.

The methods which have been seen to work in research are the traditional ones whilst participatory and the uses of model villages are also used. While in the potential demand for cooperation in research and training for institutions; there was need for collaboration of scientists in the same field in countries within the same ecological region. While for best practices RUFORUM, model of TRF and ARET in terms of their crops was examples which might be spread through out the SADC region for adoption.

There are many research alliances within Malawi, these span from the interactions between DARS and several key players in the research business. Whilst across the SADC region it is the CGIARs centers which play an active role. Also organisations such as SANBio and RUFORUM are biased towards regionally development in terms of both training and research.

12.0 Conclusions

From the study, the following conclusions were made:

- There are several ministries supporting agriculture research and training
- There are many policy documents for agriculture and natural resources research although uncoordinated and not linked to MGDS, but it remains the supreme policy.
- Several institutions are registered to be offering high level agricultural training.
- The public, private and the international institutions are involved in research.
- The NARS is coordinated by various stakeholders, which play a role in research and training.
- Monitoring and evaluation does exist in the NARS and this is coordinated by the ARC.
- Identification of roles and research needs should be done by all the players in value chain.
- Models for ARET, RUFORUM and TRF were found to be of best practice to be spread across the SADC region.
- DARS has strong linkages with various institutions which conduct research.
- Within the context of regional research the CGIARs have the capacity and mandate to do so.

13.0 Recommendations

Based on the situation defined in this report, there are a number of areas where improvements are needed in terms of research and training. Thus, the following are some of the recommendations considered appropriate to contribute to an improvement research and training:

- The collaboration of DARS and DAES should be more specific on the collaboration.
- On a national level there is need to have a harmonization in the policies and there should be formal linkages among the NARS.
- ARC should be given strong legal mandate.
- There is need for harmonization of research and policies in the region e.g. seed release and chemical testing.
- There is also need conduct collaborative research in climate change.
- The need by the NGOs to conduct research towards development of their technologies.
- More funds should be provided towards research and training by both the government and NGOs.
- There is need for more analysis of the methodology and to consult the ADP process.

References

1. Agricultural Extension in the New Millennium: Towards Pluralistic and Demand-driven Services in Malawi, Policy Document, 2000, Ministry of Agriculture and Food Security (Department of Agricultural Extension Services) A.R. Saka, A.P. Mtukuso, A.T. Daudi, M.H.P. Banda and I.M.G. Phiri (Editors),
2. Agricultural Technologies Released by the Ministry of Agriculture and Food Security: 2000-2005, 2006 (Department of Agricultural Research Services)
3. DARTS, 1995. Agriculture Research Master plan, Ministry of Agriculture and Livestock Development.
4. FARA, 2006. Agricultural Research Delivery in Africa: An Assessment of the Requirements for Efficient, Effective and Productive National Agricultural Research Systems in Africa
5. Kaarhus, R. 2004. Competence and Capacity for Agricultural Development in Malawi:
6. An overview of institutions involved in knowledge generation, training and extension in agriculture and natural resource management. Noragric Report No. 22, Noragric- Agricultural University of Norway
7. Kydd, J, Dorward A., Morrison J. and Cadisch G. Agricultural Development and Pro Poor Economic Growth in Sub Saharan Africa: Potential and Policy. *Oxford Development Studies* 32 (1) 37-57
8. Malawi Agricultural and Natural resources Research Master Plan (MANRRMP) 1999. National Research Council of Malawi, September 1999.

9. Ministry of Economic Planning and Development, 2006, Malawi Growth and Development Strategy (MGDS)
10. Mwenda A.R.E, Mtambo, C. and Katunga, A. 2007. Linking Research into use Philosophy with National, Regional Initiatives and Networks: What role does research into use has? How can RIU Synergize with the existing endeavors? 7Pth December, 2007, Lilongwe Hotel, Malawi.
11. National Fisheries and Aquaculture Policy (NFAP). 1999. Malawi Government, Ministry of Natural Resources.
12. Policy Analysis on Agriculture, Final Report. 2007. November 2007, Bunda College and NASFAM.
13. SADC, 2007. Analysis of the Agricultural Technologies and Dissemination Situation in Malawi, Gaborone, Botswana.

Annexes

Annex 1: Proposal on Collection of Detailed Information on Optional Items 12-20 of the TORs

The Malawi Team suggest that the detailed information required on Optional Items 12-20 of the TORs can easily be collected by the same experts using the same Consultant as the Team Leader. This means that Bunda College will coordinate the collection of data by the Malawi team of experts which will be composed of scientists from various departments at Bunda College, Ministry of Agriculture, Ministry of Finance, Ministry of Economic Planning and Development.

The methodology will essentially consist of a mixture of desk studies/ research of data already collected through SADC and national consultations, including some key informant interviews. Most of the experts on the Malawi Consulting Team have published a lot of information which could be made use of. In addition, through stronger linkages with Ministries and NGOs, it will be possible to complete the collection of the data as was done with the previous work. This will start with sensitisation of the various stakeholders on the type of information required, the importance/ benefits and use. After data collection, this will certainly have to be followed by a validation workshop. A final report will then be submitted incorporating comments obtained at each stage of data collection.

It is important that the experts from Malawi team up since the local experts are conversant with local situations and the whole environment. Internal quality control of the data collection and production of the report are assured.

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