NATIONAL AGRICULTURE AND NATURAL SCIENCES RESEARCH AGENDA

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ACRONYMS AND ABBREVIATIONS

GoM	Government of Republic of Malawi
GMO	Genetically Modified Organisms
MDGs	Millenium Development Goals
MGDS II	Malawi Growth Development Strategy II
NCST	National Commission for Science and Technology
NANSRA	National Agriculture and Natural Sciences Research Agenda
NGOs	Non-Governmental Organisations
INGOs	International Non-Governmental Organisations
NCANS	National Committee on Agriculture and Natural Sciences
CDM	Clean Development Mechanism
GDP	Gross Domestic Product

PREFACE

The Government of the Republic of Malawi (GoM) subscribes and reaffirms its commitment to the philosophy and ideals of the internationally agreed development goals that include the Millennium Development Goals (MDGs). At a national level, Malawi has her own national development strategy called the Malawi Growth and Development Strategy II (MGDS II) that covers the period from 2011 to 2016. The MGDS II is, in essence, a conduit through which GoM advocates her commitment towards achieving the MDGs. The MGDS has targeted agriculture as the driver of economic growth and recognizes that food security is a pre-requisite for economic growth and wealth creation. At the same time it appreciates prudent use of natural resources for sustainable growth and development. Therefore, this research agenda offers a strategy for supporting priority activities in agriculture and food security, agro-processing, green belt initiative, irrigation and water development, climate change, natural resources and environmental management, and land resources. Stakeholders agree that Malawi needs to increase its agricultural growth rate and sustainably use the natural resources if it is to significantly reduce poverty and lay the foundation for any kind of structural transformation that would benefit a large portion of the population now and in future.

This research agenda targets various research issues including: crop production; crop value addition; crop diversification; seed and germ-plasm conservation; livestock production; animal products and value addition; animal health; agricultural mechanization; irrigation; biotechnology; climate change; aquaculture; fisheries; forestry; soil; water resources; environmental pollution and basic sciences. These research priorities are aimed at achieving among other things: higher efficiency of soil nutrients and available rain water use efficiency which maintains and increases crops and fodder productivity; sustainable land management which emphasizes better land husbandry at farm level, including integrated soil management of both organic and

inorganic nutrients; Adapted conservation agriculture practices which increase the soil, water and nutrient buffer capacity.

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The National Commission for Science and Technology wishes to acknowledge their great debt of gratitude as well to its Agriculture and Natural Sciences Section for spearheading and Coordinating all the activities which have resulted into the development of the research agenda. The members of the section include: Mr. L. J. Kampira, Chief Research services officer - Agriculture and Natural Sciences; Mr. B. J. Mkoko, Country Team Leader for Program for Biosafety systems (PBS); Mr. Y. Chimbalanga, Research services Officer for Agriculture Sciences; Mr. M. D. Tembo, Research Services Officer for Natural Sciences.

1.0 BACKGROUND

The Government of Malawi (GoM) recognises the importance of agriculture and natural resources in the social economic development of Malawi. Agriculture sector remains the main driver of economic growth in Malawi. It employs about 80% of the total workforce, contributes over 80% to foreign exchange earnings, and approximately 35% of gross domestic product (GDP). The sector contributes significantly to national and household food security. It is therefore evident that investing in agriculture will foster economic growth and development and assist in attaining the aspirations of Malawians as stipulated in the country's vision 2020.

Natural resources form a principal source of social well-being and economic development in Malawi. However, these resources are under constant stress from unprecedented human, industrial and other development activities which if not properly managed might generate irreversible outcomes in the long-term. It is estimated that unsustainable natural resource use costs Malawi US$ 191 million, or 3.5 % of GDP each year. These activities have resulted into a reduction in the proportion of land under forest cover from 41% in 1990 to 35% in 2008 (MDGs Annual Report, 2009). This is compounded by increased climate variations experienced in the form of prolonged dry spells, droughts, floods and temperature variability, which in turn has negatively affected the performance of sectors such as agriculture and natural resources.

2.0 INTRODUCTION

The conduct of research in Agriculture and Natural Sciences in Malawi dates back to pre-independence era. Since then, the need for agriculture and natural sciences research has been growing in order to inform policy makers and all stakeholders in the sector. Agriculture is key to food security, economic growth and wealth creation. The sector however, faces a number of challenges including over dependence on rain-fed farming, low absorption of improved technologies, poor support infrastructure,

inadequate markets, weak private sector participation, low level of irrigation development, and lack of investment in mechanization. Consequently, the goal is to increase agricultural productivity and diversification, and thereby increasing contribution to sustainable economic growth.

Increasing population growth, coupled with relatively high poverty levels have increased pressure on natural resources and have posed a challenge to the environment. Inadequate alternative livelihoods, unaffordable energy technologies and uncoordinated policies have exacerbated environmental degradation leading to negative social and economic consequences. Government will therefore endeavor to improve management and sustainable utilization of the environment and natural resources in order to achieve; reduced environmental and natural resources degradation and environmental pollution. Key strategies to achieve this include: improving coordination of environment and natural resource management programmes; promoting biodiversity conservation programmes; promoting development and implementation of Clean Development Mechanism (CDM) projects; promoting projects on waste management and air pollution control and other environmentally friendly technologies and practices.

3.0 GOAL AND OBJECTIVES OF THE NATIONAL AGRICULTURE AND NATURAL SCIENCES RESEARCH AGENDA

3.1 Goal

The overall goal of the NANSRA is to guide researchers, policy makers, program implementers, academic institutions, development partners and other stakeholders on agriculture and natural sciences research priorities for Malawi.

3.2 Specific Objectives

The specific objectives of the agenda are to:

- Promote the conduct of agriculture and natural science research response to the priority needs of Malawi.
- Facilitate the mobilization of resources for the conduct of locally relevant agriculture and natural sciences research
- Promote multidisciplinary and collaboration in the conduct of research
- Facilitate the coordination of agriculture and natural science research conducted by various stakeholders.
- Promote the strengthening of capacity for conducting research in Malawi.
- Facilitate translation of research findings into policy and practice

4.0 GUIDING PRINCIPLES

The implementation of the NANSRA shall be guided by the following principles:

4.1 Political Will and Commitment

Undertaking meaningful research that addresses priority needs of Malawi requires adequate resources available through political will at all levels.

4.2 Value and Demand Driven Research

Stakeholders shall be encouraged to conduct research responsive to priority national agriculture and natural resources needs of Malawi.

4.3 Ethics, Human Rights and Law

The dignity and rights of all research participants including vulnerable populations shall be promoted and protected as enshrined in the bioethics principles, constitution of the Republic of Malawi and all relevant Malawi laws, national policies, regulations and guidelines as well as in tandem with international treaties.

4.4 Networking, Public and Private Partnerships and Collaboration

Concerted efforts and strategic partnerships with public and private research institutions and with a cross-section of other stakeholders shall be promoted.

4.5 Multidisciplinarity and Complementarity

Research studies that are multidisciplinary and/or complementary in nature shall be promoted to enhance skills transfer, optimal usage of resources, and translation of research findings into policy and programmes.

4.6 Intellectual Property Rights

The patenting of discoveries resulting from research is the protection of the investment made in research and ensures that these discoveries have the opportunity to reach the stream of commerce. Investments in intellectual property are returned to the public through products that benefit the public, increased employment, and individual and corporate taxes. However, it is recognised that there is inadequate awareness on the role of IP in most research and development institutions and the society at large. Further there is absence of the institutional technology transfer offices in the universities and research and development institutions to link researchers to industries, through technology negotiations and licensing. It is therefore, recommended that NCST should develop programmes and strategies to create awareness, build capacity and facilitate the establishment of sector specific IP guidelines, as well as initiating the establishment of technology transfer office in the University and research and development institutions in the country.

5.0 METHODOLOGY

This section describes the approach and process that were followed in developing the National Agriculture and Natural Science Research Agenda.

5.1 Approach and Process

The setting of research priorities was guided by principles of country demand driven; analytical evidence; stakeholder participation; transparency and value-drivenness.

The general process that was followed included the undertaking of the following key activities;

- Establishment of the National Task Force for the Development of the NANSRA with concrete terms of reference
- National Taskforce Workshop for the Identification of the Thematic Priority Research Areas.
- Gap analysis studies in the identified thematic priority areas of research to inform the drafting of the NANSRA
- Conducting gap analysis studies by the task force team using literature review, key informant interviews, institutional consultations and focus group discussions as data collection techniques.
- Subgroup meetings for each thematic priority area to review findings of gap analysis studies
- Revision of gap analysis reports by Task Force.
- National Task Force Meeting to review revised gap analysis reports
- Drafting of the NANSRA using the gap analysis reports
- Review of the Draft NANSRA by a special team of advisors in agriculture and natural sciences research
- Incorporation of comments from a team of advisors
- National stakeholders' consultative meeting on the draft NANSRA
- Finalization of the NANSRA document by incorporating comments from stakeholders workshop

6.0 RESEARCH AREAS

This section presents the key research priorities. The priorities are organized in eighteen thematic areas which were identified as key priority research areas for Malawi. These areas are: crop production; crop value addition; crop diversification; seed and

germ-plasm conservation; livestock production; animal products and value addition; animal health; agricultural mechanization; irrigation; biotechnology; climate change; aquaculture; fisheries; forestry; soil; water resources; environmental pollution; basic sciences. Within each of these thematic priority areas, priorities are articulated in specific sub-themes. An attempt has been made to outline these priorities within each sub-theme.

6.1 CROP PRODUCTION

The world population is rising every day and this call for more food to be produced. The subsistence approach of producing food is being challenged by among other things, climate change and the growing numbers of resistant and recalcitrant weeds and pests. To overcome these challenges, research is the answer. Innovative ways of growing food crops must be found if farming communities are to sustain their agricultural activities. Also post harvest losses need to be mitigated through better ways of storage and this can be done through research in the following areas.

i. Breeding for high yield and adaptability for all major crops
ii. Integrated weed, pest, disease and quality management
iii. Post harvest losses management
iv. Development of area specific agronomic recommendations
v. Conservation agriculture and land resource management
vi. Soil health and fertility improvement

6.2 CROP VALUE ADDITION

Farming communities need to benefit from their efforts. For this to happen, farmers need to add value to their crops as the selling of unprocessed food crops brings limited returns to farmers . This can be done through, among other things, processing of the raw food. To come up with the best ways of processing raw food and preserving them before selling requires innovation as the environment in which farmers operate is

continually changing. This necessitates the employment of research to generate new knowledge to enable farmers sustainably add value to their agricultural products in the following areas.

i. Agro-products processing
ii. Agro-packaging and marketing
iii. Preservation
iv. quality assurance and Certification
v. Crop multiple utilization

6.3 CROP DIVERSIFICATION

Farming communities need to diversify their crop production. This is necessitated by among other things, climate change and unpredictable weather patterns. Diversification ensures production if weather conditions favour one crop and not the other. If for example maize fails due to adverse weather conditions, one can benefit from drought resistant crops such as cassava. To identify various crops for diversification research shall be carried out in the following areas;

- Enhancement and promotion of alternative high income crops such as cotton , horticulture and floriculture,
- Domestication of indigenous crops
- Quality analysis of non-traditional and indigenous crops;
- Value addition of non-traditional and indigenous crops

6.4 GERM PLASM CONSERVATION

Plant genetic resources (germplasm) are the foundation for sustainable agriculture and Malawi's food security. They possess genes that offer resistance to pests and diseases and resilience to abiotic stresses, such as drought tolerance, soil erosion, and other constraints.

However, genetic resources are eroding at unprecedented rates as a result of the loss of habitat, outbreaks of pests and diseases, and abiotic stresses. Therefore, it has become imperative to conserve genetic resources for agricultural sustainability and the preservation of biological diversity.

Conservation requires use of clean planting materials such as materials are seeds. Clean production of seeds in a changing environment requires new knowledge that is generated through research. So too new knowledge is required to store germplasm in variable environmental conditions. Research in the following areas is envisaged to promote seed and germ plasm conservation.

i. Enhancement and promotion of locally developed crop varieties
ii. Biochemical and molecular characterization of germ plasm
iii. Preservation of germ plasm
iv. Quality assurance and certification

6.5 LIVESTOCK PRODUCTION

The purpose of the livestock production research is to develop and disseminate appropriate technologies and promoting their adoption to facilitate profitable livestock production in Malawi. Malawi is lagging in terms of quality and quantity of animals for food, hence the need to improve the status quo through generation of new knowledge through research. Research for the enhancement of livestock production shall be in the following areas:

i. Breeding and genetic improvement
ii. Enhancement of non conventional livestock production
iii. Feeds and feeding
iv. Livestock disease and parasite management
v. Enhancement of animal welfare

6.6 ANIMAL PRODUCTS AND VALUE ADDITION

Many of the value added foods are designed to decrease chances of diseases, managing the disease conditions, extending their shelf- life, maximization of livestock products and promoting health of the consumers. In order for the processes to be done sustainably and with innovation, research has to come into play. Value addition has the advantage of increasing profit margins to farmers. As the market forces are versatile, to maintain the farmers in the market world, the farmers need the support of research in the following areas;

i. Processing of livestock and livestock products
ii. Utilization of livestock and livestock products
iii. Humane slaughter
iv. Maximization of livestock and livestock products
v. Animal products and drug residues

6.7 DOMESTIC AND WILD ANIMAL HEALTH

Research can help management and understanding: diagnosis, epidemiology, pathogenesis, and genomics of bacterial and viral pathogens of human and food-producing animals. Animal health research is aimed at improving the health of both domesticated and wild animals. The health of domesticated animals, with respect to food animals, has an impact on food production and farmers' returns after sales. It is also important that the health of wild animals is taken care of as some diseases can be transmitted from wild animals to farm and household animals. The health of domesticated animals may also have a bearing on human life as some diseases can be transmitted from animals to people. Research in the following areas is therefore encouraged;

i. Trans-boundary animal disease control
ii. Rapid diagnostic techniques for early diseases detection
iii. Enhancement of veterinary public health
iv. Enhancement of veterinary epidemiology
v. Animal disease vaccine production and use
vi. Disposal of diseased and culled animals

vii. Animal quarantine services
viii. Inspectorate and regulatory services
ix. Animal disease research and investigation
x. Animal welfare and health
xi. Vector borne disease of livestock

6.8 AGRICULTURAL MECHANIZATION AND FARM IMPLEMENTS

Agriculture in Malawi is yet to be mechanized at a large scale. Research can help to develop low-cost and appropriate farm mechanization technologies and their subsequent promotion for increased agricultural productivity in Malawi. The basic objective of the research is to design, develop, test, adapt and promote low-cost, appropriate and innovative farm mechanization technologies. The research in this area can help to boost food production as many small-scale farmers would access the low cost technologies. Research can find measures to mitigate the negative impacts of mechanized agriculture.

i. Development of new and alternative machines
ii. Barriers to adoption of agricultural mechanization.

6.9 IRRIGATION

The efficiency of water application is controlled by the design of the irrigation system, and the way in which the watering program is scheduled to come up with best irrigation designs and minimize any negative impacts like increase of salts in an irrigated land, research can provide answers for specific areas.

i. Crop water efficiency
ii. Irrigation systems/designs
iii. Irrigation water management
iv. Water quality management

6.10 BIOTECHNOLOGY AND BIOSAFETY

Biotechnology finds applications in food science, medicine, the environment and agriculture and research is rapidly expanding the possibilities of where it will be used next. Any technology brings with it risks as well as benefits, and biotechnology is no exception. These risks need to be carefully assessed before a genetically modified plant, animal or micro-organism is released. Careful assessment of any biotechnology products calls for research. This means that research in biotechnology is important for two reasons and these are: to investigate new applications in various disciplines and to safeguard human health and the environment from adverse impacts of biotech products.

i. Development of Genetically Modified Organisms verification protocols
ii. Confined field trials of GMO crops
iii. Molecular characterization of genetic diversity
iv. Molecular diagnostics
v. Genetic modification
vi. Risk assessment and management
vii. Marker assisted breeding and selection
viii. Tissue culture

6.11 CLIMATE CHANGE

Conducting research on climate change issues is essential to understand the challenges and opportunities that global warming may have on our planet and Malawi in particular. Research will help Malawi to address what measures will be needed to adapt to these impacts and how Malawi can mitigate against the effects. Areas of research therefore include:

i. Climate and climate change modeling;
ii. Adaptation and coping mechanisms to climate change
iii. Indigenous knowledge and climate change
iv. Mitigation strategies against climate change

v. Climate smart agriculture

6.12 AQUACULTURE

Many challenges currently face the aquaculture sector. A large number of fish stocks are being overexploited leading to aquaculture production almost not being there in Malawi. To tackle these issues, research can provide the much needed mitigating measures. Research in a variety of ways can underpin better management and promote the sustainable and competitive development of aquaculture. The research activities can provide the necessary knowledge and technological base to strengthen sustainable management as well as to promote the sustainable and competitive development of aquaculture. While doing this, environmental and socio-economic factors must be considered. Research in the following areas is important to boost aquaculture:

i. Breeding and genetics
ii. Design of aquaculture designs
iii. Fish nutrition
iv. Disease and parasite control
v. Maximization of fish and fish products
    - Fish processing
    - Handling
    - Packaging
    - Marketing
    - Preservation

6.13 FISHERIES

Fish research is a branch of zoology known as ichthyology. There are three distinct groups of fish that ichthyologists study: bony fish, cartilaginous fish, and jawless fish. Fish research has become an increasingly important study as fish populations decline throughout the world including Malawi due to population increase that has put immense pressure on fish resources. The decline of fish has an immense impact on lake and river

ecosystems as well as a significant impact on one of the primary food sources for people in Malawi. Overfishing has significantly reduced fish populations across a large number of species. Research in ichthyology helps policy makers determine what course of action to take in order to maintain fish populations in Malawi waters. National and international policies are determined based on the data provided by fisheries research in such areas as.

i. Conservation of fish species
ii. Characterization of fish species
iii. Fisheries environmental management system
vi. Maximization of fish and fish products
    - Fish processing
    - Handling
    - Packaging
    - Marketing
    - Preservation

6.14 FORESTRY

Forest & Forest Products are important economical and environmental resources in Malawi. Research may also provide solutions to new diseases and pests affecting these resources. Above all the forests should be managed with climate change in mind so that they do not go extinct. The areas of research in this aspect include

i. Genetics and tree improvement
ii. Forestry ecology and ecosystem
iii. Forest conservation and protection
iv. Characterization of forest biodiversity
v. Ethno-botanical / economic botany research
vi. Utilization of timber and non-timber products
vii. Forest management systems

viii. Ecological inventories and modeling

6.15 SOIL

The role of soil is studied in both pristine and impacted systems in natural, agricultural and industrial contexts. It is important to study soils because soils are at an interface between geological, atmospheric, biological and hydrological systems. Understanding this crucial area is key to effectively managing the vital ecosystem services that support human health and well being. Important research areas include:

i. Soil conservation
ii. Soil fertility improvement
iii. Soil treatment and remediation
iv. Soil characterization
v. Soil utilization

6.16 WATER RESOURCES

There are two types of water sources in Malawi and these are surface water and groundwater. Water is not in a uniform way available to all Malawians due to quantity and quality problems. Water may be available in large quantities, like along the lakes and rivers, but it may not be safe for human consumption due to microbial and physicochemical contamination. Both ground and surface water may be contaminated due to both anthropogenic activities and natural processes. To make the water suitable for human use there is need to understand how good the available water is so that it can be treated according to what is in the water. This can be done through research. In addition to having water of poor quality, quantities may be a problem and therefore innovative ways may need to be found to control its usage and conserve it. This too needs research such areas as:

i. Water conservation

ii. Water quality assessment and monitoring
iii. Estimation of water availability
iv. Water resources and indigenous knowledge system
v. Water treatment and cleanup technologies
vi. Water catchment management
vii. Water conveyance systems

6.17 ENVIRONMENTAL POLLUTION

Pollution has an impact on public health as it has a bearing on the burden of diseases in Malawi. Prolonged exposure to environmental pollution can have adverse impacts on one's health although sometimes it takes long for diseases to be manifested partly due to long incubation period. It is important to understand the sources of air, water and soil pollution so that mitigation strategies can be mapped out. For this to take place research has to come into play to provide the much needed life saving answers in such areas as.

i. Air, water and soil pollution monitoring
ii. Development of air, water and soil clean-up strategies
iii. Environmental degradation
iv. Environmental pollution modeling, dynamics and transformations
v. Water and sanitation
vi. Waste management

6.18 BASIC SCIENCES

Basic science research is important to generate new knowledge, as a foundation of latter innovations and applications. This knowledge may not be used to solve problems immediately but can be used later in life. For example, Biotechnology is useful now but in the past it was not immediately useful. The research agenda therefore encourages basic research for generation of new knowledge or enhancing understanding of new knowledge or enhancing understanding in all aspects of agriculture and natural sciences

7.0 IMPLEMENTATION OF THE RESEARCH AGENDA

The NANSRA is the overarching guiding instrument for generating evidence that will be used in the agriculture and natural sciences sector in order to inform the development of policies and agricultural interventions. To ensure full implementation of the Research Agenda, there is a need for involvement of various stakeholders at both national and international levels in the design and execution of research. With the support of the legal tutelage of the National Commission for Science and Technology (NCST)

While Government of Malawi appreciates the diversity of needs and interests of different stakeholders in agriculture and natural sciences research, stakeholders are, however, called upon to ensure that research in Malawi is geared towards addressing the research priorities that have been outlined in this document during the period of the Agenda. It is therefore, expected that stakeholders will make deliberate efforts in conducting and supporting research in the identified priorities.

7.1 Stakeholders

Key stakeholders that are being called upon for the implementation of the Agenda include Government Ministries with line functions that have bearing on determinants of agriculture and natural sciences and their research centres of excellences and affiliate; research institutions; Public and private academia circles; the civil society organizations; private sector organizations; NGOs; INGOs; and international co-operating partners.

7.2 Coordinating Structures

Key coordinating and regulatory structures and mechanisms for agriculture and natural sciences research review and clearance in Malawi in the identified priorities shall remain the National Committee on Agriculture and Natural Sciences of the NCST.

7.3 Capacity Building, Transparency and Accountability

To ensure ownership in the design and execution of the NANSRA, stakeholders' efforts aimed at fostering capacity building in the conduct and dissemination of research results by local researchers and research institutions will be promoted.

To mitigate implementation risks, any strategies or efforts by stakeholders geared towards achieving successful operationalisation of the Agenda will be fostered. Such efforts and strategies will revolve around the following;

- **Capacity risks:** promoting covering issues of human and financial resources, processes and systems in research;
- **Governance risks:** targeting ownership, decision-making, accountability, transparency and oversight in research;

8.0 FINANCING OF THE NATIONAL AGRICULTURE AND NATURAL SCIENCES RESEARCH AGENDA

Financing of research in the identified priority areas is critical for the realization of the goal and objectives of this Agenda. Stakeholders are, therefore, implored to support the financing of research geared towards addressing priorities outlined in this Agenda. The following mechanisms of financing this Agenda shall be pursued:

8.1 Government Funding

Government shall commit direct resources at various levels to support the undertaking of research in the identified priorities. This will be done through the established Science and Technology Fund.

8.2 Research Grant Scheme

Researchers and all other stakeholders wanting to undertake research in the identified priorities shall be encouraged to take advantage of the existing national and international research grant schemes which exists.

8.3 Public and Private Partnerships

Public and private partnerships shall be an important vehicle for nurturing resource mobilization for research in the priority areas. Researchers in public and private sectors shall be encouraged to pursue a spirit of collaboration in undertaking research. Deliberate efforts in cultivating corporate social responsibility to support the financing of the Agenda shall be encouraged and sought after by researchers at various levels.

9.0 DISSEMINATION OF RESEARCH FINDINGS

Research dissemination entails popularization of research results. Researchers shall ensure that scientific knowledge is communicated to a wider audience beyond the research community. Reporting of research and its results shall be the responsibility of every researcher and the research institution. The responsibility may be delegated to either the sponsor or any individual upon mutual agreement. Research communication shall entail expressed commitment to publish or disseminate the results within a specified period.

It is incumbent upon research institutions to promote multifaceted and comprehensive research communication to achieve high quality research dissemination. Institutions conducting research in agriculture and natural sciences shall have a responsibility for dissemination of research results to ensure that the results reach end-users. The researchers have a responsibility of publishing and organizing events for dissemination of research results.

All approved research studies shall have a component on dissemination of results. Institutions shall be required to establish budget lines for dissemination of research results. Institutions shall establish research data banks and repositories and compile annual directories of research in order to facilitate access and availability of research data and information for use by end-users.

The National Commission for Science and Technology shall ensure that Research Information is available for utilization at the national level by policy makers, communities, target populations, researchers and all other relevant stakeholders. It is, therefore, hoped that the NANSRA will stimulate interest that will generate research evidence in the identified priority areas.

10.0 MONITORING AND EVALUATION OF THE AGENDA

The tracking of the stakeholders' adherence to the Agenda shall be part and parcel of monitoring the Agenda implementation. The tracking will be informed by some tools/indicators as described below. This tracking shall benchmark the review of the Agenda.

10.1 Tools for Tracking Adherence to the Agenda

10.1.1 Monitoring and Evaluation (M&E) Reports

NCANS shall be supported to be undertaking M&E visits to sites where the approved studies are being conducted.

10.1.2 Progress and Final Reports

Progress and final reports shall be submitted to the NCANS that approved the study as per its stipulated guidelines and standard operating procedures. At the end of the research study, final report shall be deposited with NCST.

10.1.3 Database and Directory of Research Studies

Final reports of studies deposited with NCST shall be used to compile database and directories of approved research studies.

10.2 Review of the Agenda

This Agenda has a lifespan of five years. Informed by emerging issues in agriculture and natural sciences and the above stated indicators for tracking the stakeholders' adherence to the implementation of the Agenda, there would be a midterm evaluation followed by a final review of the Agenda after five years.