



**WEST AFRICA AGRICULTURAL PRODUCTIVITY PROGRAMME
AGRICULTURAL RESEARCH COUNCIL OF NIGERIA**

NATIONALLY COORDINATED AGRICULTURAL RESEARCH PROJECTS (NCRPs)

STRATEGY DOCUMENT

AUGUST 2013

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Executive Summary

1. Nigeria is currently implementing on an Agricultural Transformation Agenda that is aimed at revamping the agricultural sector, ensuring food security, diversifying the economy, jobs and wealth creation and enhancing foreign exchange earnings. The Transformation Agenda anchors on the development of agricultural value chains as a major focus. Integrated Agricultural Research for development (IAR4D) forms the basis for this noble course. However, research findings can only be relevant in development when fully understood and adopted by the end-users. To this end, the Nationally Coordinated Research Projects (NCRPs), which are critical tools in technology development but in lull for some time now, must be revived to play their crucial roles in our national agricultural development.

2. Two generations of NCRPs have been implemented in Nigeria. The first generation of NCRPs which was established in 1982 was the initiative of the defunct Agricultural Sciences Department of the Federal Ministry of Agriculture and Natural Resources (FMANR). They were initially six in number namely; NCRPs for rice, maize, cassava, soybean, cattle and small ruminants; and later projects on cowpea, sorghum and fruits/vegetables were subsequently added. These NCRPs were designed to assist with funds to complement the resources available in the Institutes of participating scientists and to enable manpower to be drawn from within and outside the research institutes' system for solutions to various agricultural problems. The NCRPs were also set up to reduce unhealthy rivalry and competition, reduce wasteful duplication and ensure that research on particular crops, animals or problems are tackled simultaneously in its entirety collectively by all scientists and with a spirit of cooperation taking into consideration the ecological peculiarities of the country and the socio-economic and cultural background of people. The NCRPs were funded from the annual national budget starting from 1982, but suffered funding deficit from 1985 due to the Structural Adjustment Programmes (SAP).

3. The second generation of NCRPs was established during the defunct National Agricultural Research Project (NARP). The NARP, which was financed by the World Bank and the FMA&NR, came into operation in 1991 for duration of seven years (1991 – 1998). However, the NARP funded NCRPs which involved 29 approved projects had their implementation stopped following the termination of funding from NARP in 1998. And towards addressing the situation the Agricultural Research Council of Nigeria (ARCN) which was established by degree 44 of 1999 now an Act of the National

Assembly, has the responsibility of coordination, supervision and regulation of agricultural research, training and extension activities in Nigeria. Accordingly, the Council is desirous of revitalizing the NCRPs as part of its statutory mandate.

4. Towards this end, and for fulfilling its general mandate, ARCN is partnering with the West and Central Africa Council for Agricultural Research and Development (CORAF/WECARD) to implement the West Africa Agricultural Productivity Programme (WAAPP), a sub-regional programme of ECOWAS funded mostly by the World Bank. The objective of the project is to increase agricultural productivity in the countries of the sub-region. Specifically the Programme aims at providing enabling conditions for Nigeria to cooperate with countries in the West African sub-region in technology generation and dissemination with a view to improving access of participating farmers to improved agricultural technologies and promote the culture of demand-driven technology generation and dissemination in the country using the value-chain approach. In particular, the project seeks to transform the National Institute for Freshwater Fisheries (NIFFR) into a National Centre of Specialization (NCOS) in Aquaculture for the benefit of the region.

5. Hence the decision taken by the ARCN/WAAPP to undertake a process of reorganization and revitalization of the NCRPs in a manner that will take cognizance of these and other issues relevant to the development of a sustainable framework through a broad-based consultative process for the development of a new NCRP strategy. The process involved the organization of National Stakeholders and Experts Consultative Workshop, which drew participants from a broad spectrum of stakeholders, followed by the work of a Committee to put up a strategy document for a comprehensive reorganization and revitalization of NCRPs. The Committee was charged with the responsibility of producing the NCRP Strategy document. The latter was based on the workshop report and other available information including the institutional memory about past generations of NCRPs in the country and the knowledge of best practices in other parts of the world.

6. In this connection, the standard objective of NCRP was to foster coordinated collaboration among the NARIs and other stakeholders for the purpose of development, adaptation, adoption, promotion and utilization of improved agricultural technologies in Nigeria, and, with a view to contributing to improved food security, agricultural growth, employment, farmers' incomes and reduced poverty in Nigeria. The expected output of the policy efforts being sustained increase in agricultural productivity and Production, enhanced capacity of the National Agricultural Research and Extension System (NARES)

to conduct needed and relevant research for development, thereby promoting sustainable and holistic well-coordinated agricultural research system in Nigeria.

7. Thus, the design of the proposed strategy was premised on three main elements namely, instrumentation, formulation/appraisal and implementation including monitoring and evaluation. Thus instrumentation consists in conventional instruments for managing research, contemporary instruments of IAR4D and other instruments identified. The formulation and appraisal aspect involves the formulation of strategies for implementation of specific NCRPs, the SWOT analysis and needs assessment of specific NCRPs, and supervision and review of specific NCRP implementation modalities. Strategy implementation involves the mobilization for Institutional restructuring for effective implementation, determination of resource requirement and financial implications, and production of a work plan and logical framework of implementation.

8. The strategies for the sustainability of this design were identified as follows:

- Documentation
- MoU / Agreement document, etc.
- Accountability
- Transparency
- Due process
- Capacity strengthening for coordination

ABBREVIATIONS AND ACRONYMS

AATF	African Agricultural Technology Foundation
ABU	Ahmadu Bello University
ACs	Assistant Coordinators
ADPs	Agricultural Development Projects
AICRPs	All India Coordinated Research Projects
ARCN	Agricultural Research Council of Nigeria
ARMTI	Agricultural Research Mechanization & Training Institute
AROC	Agricultural Research Outreach Centers
ARS	Agricultural Research Service
ATA	Agricultural Transformation Agenda
BMGF	
CBN	Central Bank of Nigeria
CGIAR	Consultative Group on International Agricultural Research
CIDA	
CORAF/WECARD	Conseil Ouest et Centre Africain Pour la Recherche et le Developpement Agricoles/West and Central Africa Council for Agricultural Research and Development
CRIN	Cocoa Research Institute of Nigeria
ECOWAS	Economic Community of West African States
EMBRAPA	Empresa Brasileira de Pesquisa Agropecuaria/Brazilian National Agricultural Research Council
ES	Executive Secretary
FARA	Forum for Agricultural Research in Africa

FBS	
FCAs	Federal Colleges of Agriculture
FCT	Federal Capital Territory
FFD	Federal Fertilizer Department
FGN	Federal Government of Nigeria
FMANR	Federal Ministry of Agriculture & Natural Resources
FMAWR	Federal Ministry Agriculture & Water Resources
FMST	Federal Ministry of Science & Technology
FPDD	Fertilizer Procurement and Distribution Division
FRIN	Forestry Research Institute of Nigeria
FUNAAB	Federal University of Agriculture Abeokuta
FUTMinna	Federal University of Technology Minna
GDP	Gross Domestic Product
IAR	Institute for Agricultural Research
IAR&T	Institute for Agricultural Research & Training
IAR4D	Integrated Agricultural Research for Development
IARCs	International Agricultural Research Centers
IARI	Indian Agricultural Research Institute
ICAR	Indian Council of Agricultural Research
IEC	Information, Education and Communication
IFAD	International Fund for Agricultural Development
IPR	Intellectual Property Right
JC	Joint Coordinator
JICA	Japan International Cooperation Agency

LCRI	Lake Chad Research Institute
LGA	Local Government Area
M&E	Monitoring & Evaluation
MoU	Memorandum of Understanding
MTRM	
MTRP	Mid-Term Research Plan
NA	Native Authority
NABDA	National Biotechnology Development Agency
NACAR	National Advisory Committee on Agricultural Research
NACCIMA	Nigerian Association of Chambers of Commerce, Industry, Mines & Agriculture
NACGRAB	National Center for Genetic Resources and Biotechnology
NAERLS	National Agricultural Extension, Research & Liaison Services
NAIP	National Agricultural Innovation Project
NAPRI	National Animal Production Research Institute
NARIs	National Agricultural Research Institutes
NARP	National Agricultural Research Project
NARS	National Agricultural Research System
NARSP	National Agricultural Research Strategy Plan
NAS	National Academy of Science
NASC	National Agricultural Seed Council
NC	National Coordinator
NCAM	National Center for Agricultural Mechanization
NCFTP	Nationally Coordinated Fertilizer Trials Project
NCOs	National Centers of Specialization

NCPs	Nationally Coordinated Projects
NCRI	National Cereals Research Institute
NCRPs	Nationally Coordinated Research Projects
NE	North-East
NFTC	National Fertilizer Technical Committee
NGOs	Non-Governmental Organizations
NIFFR	National Institute for Freshwater Fisheries Research
NIFOR	Nigerian Institute for Oil Palm Research
NIHORT	National Horticultural Research Institute
NIHORT/FCH	National Horticultural Research Institute/
NIOMR	Nigerian Institute for Oceanography & Marine Research
NISER	Nigerian Institute of Social and Economic Research
NITR	Nigerian Institute for Trypanosomiasis Research
NPFS	National Program for Food Security
NRCRI	National Root Crop Research Institute
NRP	National Research Project
NSPRI	Nigerian Stored Products Research Institutes
NSTDA	Nigerian Science and Technology Development Agency
NVRI	National Veterinary Research Institute
NW	North-West
OAU	Obafemi Awolowo University
OFAR	
OFR	
PCs	Project Coordinators

R&D	Research & Development
RBME	Result Based Monitoring and Evaluation
RRIN	Rubber Research Institute of Nigeria
SAP	Structural Adjustment Program
SC	Steering Committee
SE	South-East
SOEs	Statement of Expenditures
SW	South-West
SWOT	Strength, Weakness, Opportunities and Threats
TOR	Terms of Reference
TSCs	Technical Sub-Committees
TV	Television
TVES	Training and Visit Extension System
UAA	
UAM	
UI	University of Ibadan
UniLag	University of Lagos
UniMaid	University of Maiduguri
UniPort	University of PortHarcourt
UNN	University of Nigeria Nsukka
USA	United States of America
USAID	United States of Agency International Development
USDA	United States Department of Agriculture
WAAPP	West African Agricultural Productivity Program

WAAPP/PPAAO	West African Agricultural Productivity Program/
WAIFOR	West African Institute for Oil Palm Research
WAIRO	West African Inter-territorial Research Organization
WAITR	West Africa Institute for Trypanosomiasis Research
WASPRU	West Africa Stored Products Research Unit
WB	World Bank

1. INTRODUCTION

1.1 Agriculture in Nigeria

1. Agriculture is a key component of the Nigerian economy, currently contributing about 42% of its GDP and employing about 70% of the active population. More than 70 percent of Nigeria's estimated population of 160 million is engaged in agriculture and largely consists of small farmers who reside in rural areas. Agriculture employs about two-thirds of Nigeria's total labour force, contributes about 42% of the Gross Domestic Product (GDP) and provides 88% of the non-oil earnings. The agricultural GDP is contributed by Crops (85%), Livestock (10%), Fisheries (4%) and Forestry (1%). Small-scale farmers with less than two (2) hectares under cropping accounted for more than 90% of the agricultural output. It is estimated that about 75% (68 million ha) of the total land area has potential for agricultural activities with about 33 million ha under cultivation. Similarly, of the estimated 3.14 million ha irrigable land area, only about 220,000 ha (7%) are utilized (FMAWR, 2008).

2. The Nigeria's agricultural sector has traditionally been expected to fulfill such roles as providing food for the teeming population, industrial raw materials, generating foreign exchange earnings, employing part of the labour force, and providing income for farming households. The sector has huge potential that is waiting to be translated into wealth. Presently, the sector has significantly underperformed its potentials. Fifty years after independence, Nigeria is still battling with an agricultural sector characterized by food shortages and inconsistent agricultural policies. The Country has continued to import large quantities of rice, wheat, sugar and fish. Yields of many crops have remained low. Yet, Nigeria has 18 agricultural research institutes, three universities of agriculture and forty seven faculties of agriculture in both state and federal universities as well as ten faculties of Veterinary Medicine. Together with the country's colleges of agriculture, these key elements of the National Agricultural Research System (NARS) have the primary responsibilities for generating and disseminating appropriate technologies, supporting innovation and training human resources for agriculture and rural development in the Country.

3. The research institutes within the NARS are primarily involved in research for technology development, dissemination and adoption; while the universities of agriculture and the faculties of agriculture are primarily involved in training manpower required in the sector in addition to technology generation and dissemination; and the Federal and state colleges of agriculture focus their attention on the training of junior and intermediate level manpower in agriculture and rural development. Thus, synergy among the different players is required in order for the desired goals to be achieved.

4. Recently, the concept of Integrated Agricultural Research for development (IAR4D) was introduced as strategy for the accelerated transformation of agricultural systems. However, research findings can only be relevant in development when fully understood and adopted by the end-users. To this end, the NCRPs, which are critical tools in technology development, must be revived to play their crucial roles in Nigeria's agricultural development process.

5. The NCRPs were designed to assist with funds that would complement resources of the individual institutes in terms of participating scientists and to enable manpower to be drawn from within and outside the research institutes for solutions to various national agricultural problems. They were also set up to reduce unhealthy rivalry and competition, reduce wasteful duplication and ensure that research on particular crops, animals or problems are tackled simultaneously in its entirety collectively by all scientists and with a spirit of cooperation taking into consideration the ecological peculiarities of the country and the socio-economic and cultural background of people. Specifically, NCRPs have the following added advantages:

- 1) Collective planning of national research programs by institutions within the NARS;
- 2) Development of research activities, and task allocation among the collaborators;
- 3) Sharing of human and material resources and information that may be generated from the research effort;
- 4) Monitoring of activities and progress by the researchers themselves;
- 5) Multidisciplinary and multi-institutional approach to solutions of problems;
- 6) Self reliance, transparency and decentralization of research operations; and
- 7) Strong national commitment and support.

6. Thus, the main objective of setting up NCRPs was to mobilize all available scientific and technical manpower, equipment and infrastructural facilities in the country for providing quick answers to the various problems of agricultural productivity, and to develop networking among research institutions (research institutes, universities and ADPs/scientists in the country in order to ensure cost-effective use of human and material resources.

1.2 History of Agricultural Research, Training and Extension in Nigeria

1.2.1 *Agricultural research*

7. Agricultural research in Nigeria started formally with the establishment of a botanical garden in Lagos in 1893. The garden was part of a network of gardens focusing on the introduction of new crops. In 1903 the Forestry and Botanical Department (renamed Agricultural Department) for southern Nigeria was created. Later, this was divided into two regional departments resulting in the establishment of a Department of Agriculture for Southern Nigeria (1910) and another one for Northern

Nigeria (1912). Following the amalgamation of the two regions in 1914, the two departments were unified to form a single Department of Agriculture in 1921.

8. Progress was made in terms of infrastructure and human resources resulting in new research stations, more research personnel, and a more technical research program that included plant breeding and plant pathology. Research continued to focus, however, on export crops like oil palm, rubber, cotton, groundnut and cocoa.

9. The Forestry and Veterinary Departments were also established in 1914, but only began research activities in 1920; Fisheries Research came much later, in 1941, with the establishment of the Fisheries Development Branch by the Department of Agriculture.

10. During World War II, the British Government sought a more active role in the promotion of science and technology in its colonies, which led to the creation of several regional agricultural research organizations in West Africa, which were part of the West African Inter-territorial Research Organization (WAIRO). Three of these—the West Africa Institute for Oil Palm Research (WAIFOR), the West Africa Institute for Trypanosomiasis Research (WAITR), and the West Africa Stored Products Research Unit (WASPRU)—were located in Nigeria.

11. With independence in 1960, the regional institutes were nationalized and the Nigerian Institute for Oil Palm Research (NIFOR), Nigerian Institute for Trypanosomiasis Research (NITR), Nigerian Stored Products Research Institute (NSPRI) and Cocoa Research Institute of Nigeria (CRIN) were established.

12. With regional governments formed after 1960, research activities were regionalized in line with the constitution that put agricultural development on the residual legislative list thereby making it a sole responsibility of the regions, and thus eliminating Federal Government involvement. These regional efforts, however, did not yield the expected results prompting the Federal Government to intervene with a major reorganization and expansion of research institutes in the 1970s, having suspended the constitution from outset of military administration since 1966 and decimated the regions into states since 1967. Subsequently, the Agricultural Research Council of Nigeria was first created in 1977 followed by the production of another constitution in 1999 that now put agricultural development on the concurrent legislative list as a joint federal and state responsibility.

13. As the research institutes evolved, they also faced the need to establish training units to cater for the training of agricultural officers from the various regions in the area of extension services delivery. Accordingly, the schools of Agriculture in Ibadan, Akure, Umudike and School of Veterinary and Animal Production in Vom and Ibadan were established. Similar Schools were established for the fisheries in Lagos, New

Bussa and Baga. The School of Produce and Stored Products in Kano was catering for the booming agricultural produce exports especially in the sixties and seventies when expertise as a produce inspector was "sine qua non" to attending the school. Subsequent evolution and growth of the Institutes also affected the establishment of schools to cater for their training mandate. The transfer of the Agricultural Sciences Department (ASD) along with its research institutes and colleges to the Federal Ministry of Agriculture and Rural Development in 1992 presented new opportunities for the growth and development of the schools of agriculture as they became transformed into the Federal Colleges of Agriculture with administrative autonomy based on the needs for training at the national and higher national diploma levels.

14. The first ARCN along with other sectoral Councils were abolished in the same year (1977) and a Nigerian Science and Technology Development Agency established in its place. Further changes came with the Research Institutes Establishment Order (RIEO) in 1980, under which many Research Stations and Departments were upgraded to National Institutes. The research institutes underwent further significant reorganization, including review of their mandates as part of the Green Revolution Programme (GRP) of the Federal Government in early 1980s.

15. Changes in structures continued under the military regimes. But in 1992, the need to re-align agricultural research to the Federal Ministry of Agriculture was accepted by Government and the ASD along with the fifteen agricultural research institutes were formally returned to be fully integrated into their sectors.

16. In 1999 the Federal Military Government recreated the ARCN by signing the *Agricultural Research Council of Nigeria decree No 44 of May 26, 1999*¹ into law. The start of activities was delayed as Government focused its priorities on the implementation of various other Presidential Initiatives (PIs) as well as the National Special Programme on Food Security (NSPFS). ARCN was finally launched in November 2006, with the appointment of its Executive Secretary. The Council was established to address the challenges faced by the agricultural research system, whose redirection is a priority of the Council.

1.2.2 Research Extension Linkage

17. The history of extension services in Nigeria has been linked to two factors, namely: changing political conditions and the growth of the civil service structure (Mijindadi, 1985). The establishment of Agricultural Department at Moor Plantation, Ibadan, for Southern Nigeria in 1910 was regarded as the first attempt to lay the foundation of Nigeria's Extension Service. In 1912, a similar department was set up at Samaru by the Colonial Administration for Northern Nigeria (Mijindadi, 1985). The constitutional changes of 1952 resulting in "Internal self-government" also gave rise

to the establishment of the regional departments of agriculture in the Eastern, Western and Northern parts of the country. Within each Department, an Extension Service Division was established alongside other divisions. During this period of colonial rule, the Native Authorities (NA) had departments of agriculture. The latter were responsible for extension at the local level with the regional government's departments playing a supervisory role. The interest of the Colonial Administration was clearly in the development of export crops. Hence, Tree Crops Development Units for Cocoa, Oil Palm and Rubber, for example, were set up as parts of the Agricultural Departments in the East and Western regions (Mijindadi, 1985). With the creation of more States in 1968 and 1975, each state established a Ministry of Agriculture and Natural Resources primarily with extension responsibilities. Also, in 1968, the Federal Ministry of Agriculture came into being. Initially, the Ministry's responsibility included the planning and co-ordination of agricultural programs as well as the control of activities of agricultural research institutes.

18. Based on the changes noted above, Nigeria has a history of using a range of extension approaches and techniques, often resulting in weak linkages with research, and little impact on agricultural productivity. At present, modified versions of the Training and Visit (T&V) extension system are being used, as well as newer, more participatory approaches. However lack of funding is still resulting in under-performance.

19. Under the NPFS, the Government aims to strengthen extension service delivery by improving the ratio of extension agent to farm family and by establishing farm support centres in agricultural communities. The intention is to develop *one stop* facilities in each of the country's LGA. This would involve the training of master trainers and facilitators in each state and the Federal Capital Territory (FCT) and establishing farmer field schools and building of farmers' capacity at the centres.

20. The farm support centres served as important sources of authoritative information for local communities; providing a number of services including education and training for farmers, demonstration farms, technological support, farm input supplies and other related technical services. Similarly, to improve linkages with the farming communities, the Adopted Villages with Agricultural Research Outreach Centers (AROC) were being promoted by ARCN through the NARIs and FCAs.

2.0 NIGERIA'S EXPERIENCE IN NCRP IMPLEMENTATION

2.1 Antecedents of NCRP

21. Nigeria's major experience in operating NCRPs was during the defunct NARP. The latter, was financed by the World Bank and FMANR, came into operation in 1991 for duration of seven years (1991 – 1998).

22. In the distant past, Nigeria had only each department of Agriculture, Forestry and Veterinary Research. National research coordination presented no problems at this stage. Later, arable crops research stations were established in Samaru, Umudike and Ibadan. The Agricultural Research Institutes Decree No. 35 of 1973 increased the number of agricultural research institutes to 18. Universities, faculties and departments of agriculture also increased substantially. The need for collaboration of agricultural research, particularly of crops research, consequently grew rapidly. After much preliminary consultations, six Nationally Coordinated Projects (NCPs) were established in 1982, representing the first generation of NCRPs in Nigeria. These covered rice, maize, cassava, soybeans, cattle and small ruminants. Projects on cowpea, sorghum and fruits/vegetables were later added; and, in the late 1980s, the Nationally Coordinated Fertilizer Trials Project (NCFTP) was also added, as a special activity under the aegis of a National Fertilizer Technical Committee (NFTC) which is a statutory advisory organ of the FMA on the fertilizer economy through the then Fertilizer Procurement and Distribution Division (FPDD) that later became Federal Fertilizer Department (FFD).

23. When NARP was established in 1992, institutions engaged in agricultural research in the country had increased in number and complexity. There were 18 NARIs, 23 faculties of agriculture and 5 International Agricultural Research Centers (IARCs) of the Consultative Group on International Agricultural Research (CGIAR), all of which carried out research within the country. Thus a system emerged for the country as National Agricultural Research System (NARS), which comprised the NARIs with almost 900 researchers, and the universities, perhaps with a greater number, making a substantial number of scientists in the national institutions engaged in agricultural research.

24. NARP developed the National Agricultural Research Strategy Plan (NARSP) with the Mid-Term Research Plan (MTRP) as a major element in the strategy plan. The MTRP consisted of research themes which had been grouped into Nationally Coordinated Research Projects (NCRPs) under the sub-sectors of agriculture. Eleven were in arable crops, four (4) each on livestock, forestry and tree crops, two (2) on

fisheries and one each on soil management, socio-economics/policy and research extension linkages delivery system.

25. During the NARP period, NARSP was used to implement the MTRP. It enabled nationwide collaborative research in all research programs in the agricultural sector. This approach enabled the development of networks between the various institutions and researchers within the country. Unfortunately, the NCRPs could not be sustained after the NARP due to lack of funding.

26. The second generation NCRPs was implemented under the defunct NARP which was established in 1991 but which took off in 1992. The NARP was conceived to strengthen and coordinate research activities in Nigeria. It was a seven (7) year intervention (1992 – 1998). The two generations of defunct NCRPs were aimed at reducing unhealthy rivalry between key research institutions, minimize competition for resources, reduce wasteful duplication and ensure that research on particular crops, animals, fisheries, management practices, etc. were tackled simultaneously, collectively by scientists and with a spirit of cooperation, taking into consideration the ecological peculiarities of the country and its socio-economic and cultural backgrounds.

2.2 Operational framework for the NARP-NCRPs

27. Basically, the operational framework consisted of coordination of the projects activities, the roles of participating institutions, the funding mechanism and the reporting system.

2.2.1 Coordination: Each NCRP was headed by a full-time national coordinator. He/she was assisted by one or more joint coordinators where necessary. The research institute with the national research mandate for the main commodity of the NCRP was designated as the coordinating center where the national coordinator resided. Joint coordinators were part-time and were located in either a university or a research institute. The duties of a national coordinator were as follows:

- i) Must be on a senior position in the institute which would be equivalent to head of division or program;
- ii) Should act as a mobilizer and promoter of research activities nationally rather than act as a supervisor;
- iii) Initiate activities for the preparation of detailed annual work-plans and implementation schedule by each participating institution based on the MTRPs and ensure that appropriate coordination arrangements are set up between the collaborating institutions within and across the zone;

- iv) Organize nationally coordinated trials (including obtaining and distributing seeds/planting materials) with newly developed crop varieties or animal breeds and/or other technology components;
- v) Assist in the preparation of proposals for variety release or release of other technologies and prepare appropriate reports;
- vi) Monitor the implementation of programme and utilization of funds along with the joint coordinators in the zones and submit reports to the Director of Institute to forward to NARP;
- vii) Collect data from collaborating institutions, collate same and establish a system for storage and retrieval. These data were to be made available freely to users;
- viii) Organize annual review and planning meetings of researchers who are participating in the programme from the various institutions;
- ix) Prepare work-plan and annual budget for the programme including for coordination and for all participating institutions and submit to the Institute Director to forward to NARP;
- x) Prepare an annual report containing research results, trial data and work-plans for the following year and route to NARP through the Director of Institute;
- xi) Liaise with regional and international institutions to promote close scientific relationship with them;
- xii) Identify research areas where further support would be needed and develop proposal for further consideration; and
- xiii) To work under the overall supervision of the Institute Director.

Conducive working environment was provided both for the National Coordinator (NC) and Joint Coordinators (JCs) in terms of office accommodation, facilities and mobility.

The Joint Coordinator who should be senior scientist with requisite qualification and on-the-job experience in the institution had the following duties to perform:

- i) Assist the NC in monitoring the implementation of the research programme in the zone by visiting the participating institutions and sending the reports to the NC;
- ii) Ensure timely submission of data and reports from participating institutions in his/her zone for forwarding to the National Coordinator;
- iii) Assist the NC to organize annual meetings and in preparing annual reports; and
- iv) Participation in annual coordination meetings.

2.2.2 Participating institutions: The coordinated programs provided a mechanism for the participation of NARIs, universities, development projects/departments, private organizations, ADPs and other relevant public and private organizations as partners in the national agricultural research system. The MTRPs which were formulated jointly by researchers from various institutions and organizations as part of the national agricultural strategy plan formed the basis for initiating the NCRPs. These plans have identified the research themes and collaborating institutions/organizations. The task allocation was carried out during a joint meeting of the NC, JCs, the participating institutions, NARP representatives and Director/management of the institute with the national research mandate. Annex II depicts the concept of the operational framework

2.2.3 Funding: The NCRPs introduced in July 1996 were designed to implement the MTRPs for 1996 - 2000 that were drawn up in the NARSP document. Operational funds were therefore provided for three years (1996 – 1998) by NARP. Subsequent funding would come from statutory allocations to the various NARIs by Government. The NC, after identifying activities for each programme, developing work-plans along with budgets for each activity and allocating tasks, saw to the timely and adequate release of funds to the participating institutions. NARP on the other hand opened NCRP imprest account at each NARI which was replenished every month and maintained at about two months eligible NCRP expenditures. Statements of expenditure (SOEs) pertaining to expenditures by a NARI for NCRP activities were claimed through SOEs every month which were forwarded to NARP. Expenditures incurred by participating institutions other than NARIs were channeled to the implementing institution through the JC to the NC who arranged for reimbursement from the Institute's NCRP account.

Expenditures incurred by a particular NARI with respect to an NCRP which was coordinated at another NARI were claimed by the NARI that incurred the expenditure. The SOE sheet clearly indicated the NCRP code so that the cost incurred was charged to the appropriate NCRP. The institute that incurred the expenditure also sent copies of the SOEs to the NC of the NCRP so that he would be aware of the expenditure incurred. It was also ensured that the NARI incurring expenditure did so within approved budget of the NCRP.

When implementing institutions other NARIs required additional funds for NCRP activities, they obtained written approval from the NC who

ratified it with NARP to ensure budgetary provision in the total approved budget.

Expenditures incurred on coordination activities were collated by the NC, certified by the director of coordinating Institute and then reimbursed by the institute. Where the joint coordination was conducted in a same NARI, the expenditures were claimed along with the other expenditures of that institute. A copy of the SOEs was always sent to the NC.

The control of NCRP imprest remained the responsibility of the Directors of the NARIs.

2.2.4 Reporting system: Reports on activities carried out under the NCRPs were compiled on quarterly basis and sent to NARP by Directors of coordinating NARIs. The Joint Coordinators who monitored the implementation of the activities of participating institutions in their respective zones compiled reports on them and sent them to the NC. The latter put up reports on national and joint coordination together with those from JCs and forwarded them to NARP through the directors of their respective NARIs. The reports contained work-plans for the various activities, implementation status of the projects, data generated and bottlenecks faced during the reporting periods.

Reports from NARIs participating in NCRPs implementation that were coordinated by different NARIs were included in the reports sent to NARP by the institutes that carried them out. However, copies were always sent to the NC for inclusion in the reports of the NCRP programs.

The reports from the coordinating NARIs were collated at NARP by the various sub-sectors – arable and horticultural crops, livestock, forestry and tree crops, fisheries and extension research. A general report for each sub-sector was prepared and presented to the National Advisory Committee on Agricultural Research (NACAR – NARP Governing Board) by Chairmen of the respective Technical sub-Committee (TSCs) at every NACAR meeting. The reports included data generated by the sub-sectoral NCRPs; degree of program implementation clearly indicating whether on schedule, behind schedule or ahead of schedule; technologies generated if any; and constraints encountered during the course of projects implementation. NARP through its Governing Board (NACAR) further prepared a report for the entire projects in all participating institutions for the World Bank Task Team Leader who visited the Project (NARP) every quarter to supervise implementation.

2.2.5 Sustainability plan: Funding of the National Agricultural Research Project (NARP) with the World Bank credit was only an intervention meant to last for only seven years (1991 – 1998). The NARP concept document therefore adequately put in place the sustainability plan which if strictly followed during project implementation would have sustained the funding of the NCRPs. Unfortunately the NCRPs implementation stopped immediately the World Bank resources were exhausted.

In the sustainability plan of NARP “concept document”, the World Bank resources would fund about 85% of project implementation in the first year while the Federal Government of Nigeria resources were to fund only 15%. As the years went by, the share of the World Bank resources would keep reducing as that of the FGN kept increasing. Thus by the seventh year of Project implementation, the World Bank share would account for only 15% while that of the FGN would have risen to 85%. By the eighth year when the World Bank credit would have exhausted completely, the FGN would take over funding 100%. However, the formula was not adhered to and hence allocations to the NARIs were grossly inadequate to keep the NCRPs implementation going.

1 st Year	World bank	Federal Govt.
Year 1	85%	15%
Year2	75%	25%
Year 3	60%	40%
Year 4	45%	55%
Year 5	35%	65%
Year 6	25%	75%
Year 7	15%	85%
Year 8	0%	100%

2.2.6 Monitoring and Evaluation: Monitoring of the implementation of the NARP-NCRPs projects rested on the Secretaries of the sub-sectoral TSCs who also served as heads of the broad sub-sectors that operated at NARP. These included arable and horticultural crops research, livestock research, fisheries research, extension research and tree crops and forestry research. Soils and water management was merged with arable and horticultural crops research sub-sector while policy and socio-economic research were joined to extension research.

Basically, the TSC Secretaries visited the national coordinators who were located in the NARIs once every quarter to generate reports on projects implementation for meetings of the TSCs, which were held every quarter. From these reports, NARP management developed reports (memoranda) for the Governing Board meetings, also on quarterly basis.

At each NARI that housed the National Coordinator, each NCRP was discussed project by project using the work plans (log-frames) developed for each project under the broad theme of the NCRP. Based on the deliverables indicated against each activity of the project and the time frame for their achievement, each project was evaluated. Each visit to an NCRP therefore provided information on whether an NCRP is on course, behind schedule or otherwise. Most of the projects with the participating institutions were planned to be executed in one or two years.

The TSC Secretaries also participated in the annual review meetings of each of the NCRPs. At each meeting, projects were reviewed. Some were terminated either based on its duration or due to poor performance while others were allowed to continue intact or with modifications.

The NARP document from which research themes were selected was to be reviewed every five years. The society is dynamic and policies could change with new ones emerging bringing about changes in priorities. The NCRP themes were therefore planned to be reviewed after five years in order to capture the emerging high priority research areas. They were, however, not sustained to maturity when the World Bank resources finished and their implementation stopped. The years that immediately followed the World Bank funding saw very negligible funding for agricultural research in the country.

2.2.7 Constraints to smooth projects implementation: The NARP projects implementation did not go without some hitches. At the institute level, much was not revealed at discussions with the management. Everything was well with the management, as claimed. But more truth manifested from interactions with technical staff implementing the projects. Going by their work plans, reasons for either untimely or none execution of certain activities of the projects were provided. It was therefore concluded that there was vehement and subsequent diversion of research funds for other purposes. Much of the funds released for research activities did not go in for research.

Other challenges identified at the institute's level included (i) disbursements did not match approvals on the work plans of the various projects of the NCRPs; (ii) untimely disbursement of funds coupled with lack of transparency fueled suspicion and impacted negatively on the concept; (iii) there were no data verification mechanism; and (iv) the pattern of facilities allocation, especially vehicles generated concerns among scientists.

Reports submitted to NARP management by the sub-sectoral heads included both positive and negative findings for projects implementation at the NARIs. Constraints to smooth projects implementation were always clearly outlined. However, the NARP management always noted them and put away. No action was taken to correct them and project research funds continued to be misappropriated while, projects execution suffered.

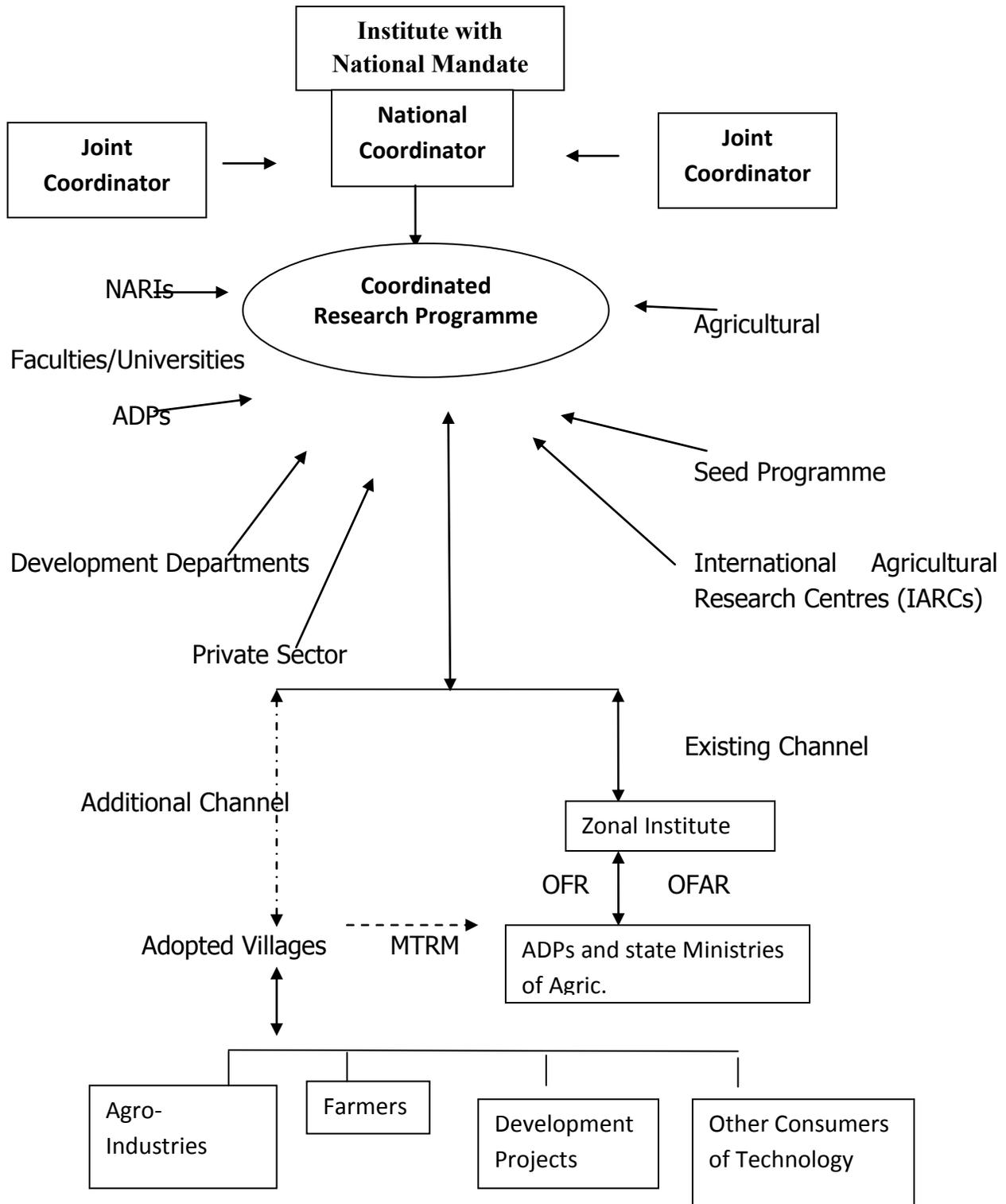
The implementation of the NARP-NCRPs was also cut short. They were planned to be executed in four years, but implementation abruptly stopped after barely two years (July 1996 – September 1998). No project therefore yielded any conclusive results. As a result, nothing can be said about their impact.

Table 1: List of NCRPs, Coordinating NARIs and Institutions of Joint Coordinators under NARP

S/N	NCRP	Coordinating NARI	Institutions of Joint Coordinators
1.	Sorghum	IAR	Unimaid (NE), FUT Minna (Central)
2.	Cowpea	IAR	Unimaid (NE), UAM (Central)
3.	Maize	IAR	UAM (Central), IAR&T (SW)
4.	Groundnut/ Cotton	IAR	None
5.	Wheat	LCRI	None
6.	Millet	LCRI	None
7.	Cassava/yam	NRCRI	UAM (Central), UNAAB (SW)
8.	Horticulture	NIHORT	IAR (NW), UAM (Central), FUTO (SE)
9.	Rice	NCRI	ABU (NW and NE), UNAAB (SW), UNN (SE)

10.	Soyabean	NCRI	IAR&T (SW and SE)
11.	Other Root crops	NRCRI	None
12.	Sugarcane	NCRI	None
13.	Forestry	FRIN	FRIN substation Zaria (NW), UAM (Central)
14.	Cocoa	CRIN	None
15.	Rubber	RRIN	None
16.	Oil Palm	NIFOR	None
17.	Coffee	CRIN	None
18.	Other Palms	NIFOR	None
19.	Other Tree crops	-	-
20.	Marine Fisheries	NIOMR	Unilag (SW and SE)
21.	Freshwater Fisheries	NIFFR	Uniport (SE and SW), NIFFR (NW and NE)
22.	Soils and Water Management	IAR&T	Unimaid (NE and NW), UAA (SE and SW)
23.	Large and Small Ruminants	NAPRI	IAR&T (SW), UNN (SE)
24.	Poultry and Piggery	NAPRI	OAU (SW), UNN (SE)
25.	Feeds and Feed Resources	NAPRI	UAM (Central), UI (SW and SE)
26.	Livestock Diseases	NVRI	NITR (Central), UAU (SE and SW)
27.	Tea	CRIN	None
28.	Socio-economic and Policy Research	NISER	None
29.	Research extension Linkage and Research policy	NAERLS	None
30.	Farming Systems Research	-	-

Figure 1: Operation of Nationally Coordinated Research Programmes



3.0 EXPERIENCES FROM OTHER COUNTRIES

3.1 NCRP in India

28. Agricultural innovations and diffusion of new technologies are the important factors in India's quest for food, nutrition, environmental security and enhancement of income and employment. Agricultural research in India has generated outstanding productivity increases in the past and shall continue to play an important role in supporting rural livelihoods and accelerating rural growth. However, rising population and per capita income are pushing up the food-demand, which needs to be met through enhanced productivity per unit area, input, time and energy. At the same time, the issues of decreasing factor productivity and resource use efficiency have also emerged. Furthermore, many promising research findings have not reached the farmers, due to either inadequacies in research designs or research results, deficiencies of delivery systems or lack of economic incentives. This is particularly visible in the complex environments and less-favored areas.

29. In order to address the problems of poverty and hunger, it was critical to redirect and augment resources devoted to agricultural research to the farming and livelihood systems of the poor rural communities. Further more, to utilize the technological breakthroughs that are already available for commercial use, the agricultural research priorities and strategies were revisited and new system-wide approaches developed and adopted.

30. The above issues were addressed through a coordinated effort on changing the content and process. Policy and technology options were screened or tested by the end-users for applicability as well as for economic, social and environmental sustainability. In the applied and adaptive research projects, the end-users of innovations were involved from the start of programs and projects and remained as partners till their completion. Both indigenous knowledge and frontier technologies were used to generate the targeted products.

31. The overall objective of the National Agricultural Innovation Project (NAIP) was to facilitate an accelerated and sustainable transformation of the Indian agriculture so that it could support poverty alleviation and income generation through collaborative development and application of agricultural innovations by the public organizations in partnership with farmers' groups, the private sector and other stakeholders. The specific objectives envisaged were:

- (a) To build the critical capacity of the Indian Council of Agricultural Research (ICAR) as a catalyzing agent for management of change in the Indian NARS;

- (b) To promote 'production to consumption systems research' in priority areas/ themes to enhance productivity, nutrition, profitability, income and employment;
- (c) To improve livelihood security of rural people living in the selected disadvantaged regions through technology-led innovation systems, encompassing the wider process of social and economic change covering all stakeholders; and
- (d) To build capacity to undertake basic and strategic research in frontier areas of agricultural sciences to meet challenges in technology development in the immediate and predictable future

32. A significant development in the field of agricultural research in India is the formulation of All India Coordinated Research Projects (AICRPs), initially for the improvement of agricultural crops, but later extended to all aspects of crop husbandry. The first AICRP started at the Indian Agricultural Research Institute (IARI) with NCRP Maize in 1957 with the active collaboration of Rockefeller Foundation. A novel feature of that program was that the central research institutes as well as agricultural universities and state departments of agriculture were brought to work together as a team to resolve research problems of the crop at national level. IARI's leadership role has been pivotal for the growth of the national coordinated centres for a large number of All India Coordinated Projects of ICARs. Later development saw to it that the coordinated projects on wheat, maize, vegetables, seeds and agronomy, previously under the control of IARI, were upgraded to the status of project directorates.

33. Almost all the coordinated projects which had their origin in IARI have been moved out and relocated in different parts of the country. Today, the ICAR is managing a total of sixty one (61) AICRP. Another feature is that some earlier AICRPs were upgraded to network projects for which there are currently 17 network projects under ICAR.

3.2 NCRP in the United States of America (USA)

34. The NCRP concept in the United States is implemented using the Program approach in which case the Agricultural Research Service (ARS) of the United States Department of Agriculture (USDA) implements its entire research project under approved national programs. Under this arrangement the following are clear:

- Their scientific research solves problems that affect Americans daily;
- They perform their research at about 100 locations;
- They often form science partnerships with others; and
- Every research project is coordinated through their National Research Programs.

3.3 NCRP in Brazil

35. The Concept of NCRP was also being used in the Brazilian national agricultural research system. The concept in Brazil is incorporated into their overall strategy for management of the research operations. Under this arrangement, Brazil operates what they term Mega Projects which employs the basic fundamental principles of nationally coordinated research projects. In the Brazilian approach, there is an infusion of business case and entrepreneurial principles. The emphasis is that all research projects are implemented bringing in the best from both within and outside the country. The projects have dedicated funding and are implemented under the strict operational guidelines provided by Brazilian Agricultural Research Corporation (EMBRAPA). A clear distinction is also made for the management of all research programs at EMBRAPA; which has three layers namely: strategic, operational and tactical level. Program management is at the operational level and projects are at the tactical levels but all are designed to achieve the strategic goals and results of agriculture in Brazil.

3.4 Lessons from Global Best Practices

- 36.** The lessons that can be drawn from the above cases are as follows:
- i. Nationally coordinated research projects are seen as a powerful management tool for bringing about change in agricultural research operations;
 - ii. There is emphasis on creating synergy, complementarities and cooperation among disparate entities;
 - iii. The pooling of all available national resources for solving common research problems benefits all;
 - iv. it's a win-win for both scientists and society;
 - v. Management of this type of arrangement also brings with it huge demand for managerial capacity at all levels of its operation; and
 - vi. There are clear demands for role clarity, funding arrangements must be guaranteed and made sustainable.

4.0 MANAGEMENT AND STRUCTURE FOR THE PROPOSED NCRPs IN NIGERIA

4.1 NCRP Policy Thrusts and Tools

37. The policy thrusts behind the proposed NCRPs should consist of the following elements:

- The NCRPs should key into the broad national agricultural policy, goals and objectives;
- The overall objective of the NCRPs is to increase agricultural productivity in the country;
- The NCRPs should be demand/market driven, while building partnerships and networks adopting the IA4D concept;
- Start with 5 – 7 NCRPs and increase the number every two years after review
- Explore broad based funding opportunities to enhance sustainability, including Institutionalize annual budget line, IGR, Externally funded Projects/Donors, contributions of private sector, States and LGAs and Research Trust fund; and
- Chief Executives to be responsible for justification of fund and activities/tasks assigned.

4.2 Governance Structure, Authority and Approvals

- The Management of NCRPs is to be domiciled in the national research program
- The NCRPs are to be coordinated by a National Coordinator, supervised by a Steering committee made up of key stakeholders across the value chain and the ARCN, IARCs, and development agencies
- The ARCN should appoint the Steering Committee of the NCRPs with a Secretariat linked to Coordinating Institute of the NCRPs and Coordinators who are not below the rank of Director
- The tenure of the Steering Committee membership should be 3 years, renewable once
- SC may be composed of about 15 members.

4.2.1 Governance

- Criteria of appointment of the Coordinators – 12 – 15 years research experience, and significant achievements in the field;
- The term of office of the coordinators and assistant coordinators is 2 years, renewable;
- Each NCRP should have not more than 3 Assistant Coordinators
- Appointment into the Steering Committee should be staggered so that replacement will not be more than 75% at a time;
- Task allocation and fund release should be by MoUs between each partner and ARCN; and
- Mid-term reviews.

4.2.2 Role of the Agricultural Research Council of Nigeria

- Responsibility to oversee and coordinate the implementation of all the NCRPs;
- Constitute a Management Steering Committee for the entire NCRPs
- Appointment of National and Joint Coordinators in consultation with mandate NARIs;
- Provision of strategic plan for agricultural research (short, medium and long terms) in collaboration with relevant stakeholders; and
- Benchmarking and regular monitoring of activities/impact assessment.

4.2.3 Role of Steering Committee

- Review and approve work plans;
- Advocacy and policy brokerage for the NCRPs;
- Monitor implementation; and
- Organize mid-term reviews.

4.2.4 Role of the National Coordinator (NC) of the NCRPs

- To prepare reports and to respond to demands from steering committee;
- Facilitate linkages and partnerships;

- Regularly (quarterly) brief ARCN and Half year Report to Government (FMARD) on activities and achievements of the NCRPs;
- Provide Secretariat to Steering Committee;
- Facilitate appointment of Resource person/Consultants for capacity building supports;
- Facilitate disbursement of fund to NCRPs; and
- Facilitate appointment of Resource person/Consultants for review of NCRP proposal/ work plan and Reports prior to presentation to SC.

4.2.5 Role of the Project Coordinators

The project coordinator will be a senior scientist who is active in research. His/her position in the concerned institute will be equivalent to that of other heads of the program/departments. The project coordinator will be assisted by appropriate scientist and administrative staff. Besides the basic infrastructure, the project coordinator's offices will also be equipped with modern office facilities by WAAPP in line with their nationwide responsibilities.

These coordinating units will have separate allocations which will be clearly indicated in the institutes' budgets. These allocations will have provisions for travel within and outside the country, for organizing meetings, for preparing and printing reports, for dispatching seeds and other materials to the collaborators as well as for other operational purposes.

The duties of the project coordinators will be as follows:

- Initiate activities for the preparation of the detailed annual plan of work and implementation schedule by each participating institutions based and ensure that appropriate coordination arrangements are set between the collaborative institutions within and across the zones;
- Organize nationally coordinated trials (obtain and distribute seeds/planting materials) with new varieties or other technology components;

- Monitor the implementation of the program and utilization of funds with help of assistant coordinators and submit reports to the National Coordinator;
- Receives data and reports from participating institutions;
- Assist in the preparation of proposals for the release of improved varieties/breeds and the dissemination of the technologies; collaborate with NASC to establish an appropriate mechanism for the multiplication of basic propagation materials;
- Organize annual meetings of researchers who are participating in nationally coordinated research programs. The aims of these meetings would be to:
 - Review the results obtained;
 - Jointly prepare a work plan for the following year; and
 - Allocate responsibilities to various institutions.

In addition to researchers, representatives from relevant development projects, ARCN/ADPs, and other appropriate organizations should be represented at these meetings;

- Prepare annual budgets, based on the plan, and submit them to the Executive Secretary of ARCN through the National Coordinator for approval
- Prepare an annual report that contains research results, trial data and work plans for the following year; the report shall be submitted through the Executive Director of the NARI to Steering Committee for approval
- Liaise with national, regional and international institution to promote a close working relationship. He/she shall inform the National Coordinator of such liaisons
- Identify research areas where further support is needed and make proposals for funding by national/international agencies
- Take responsibility for planning and operating the budget of the coordinating unit

- Establish a system for storing and retrieving relevant information and scientific data from trials: this data should be made freely available to users in the country

4.2.6 Role of Assistant Coordinators

The Assistant Coordinators will be staff members of the institutions where the research commodity is located. Basic facilities of office space and utilities and support staff will be provided by the host institutions. They will also be provided with the requisite office and transport facilities and staff to carry out their responsibilities. Assistant Coordinators will be fairly senior scientists and well respected persons in the profession. They will devote one third of their time to the coordination duties.

The main responsibilities of each Assistant Coordinator (AC) in the relevant zones will be:

- To monitor the progress of the research programs and the utilization of funds in the participating institutions and prepare reports; reports should be submitted regularly to the Project Coordinator;
- To ensure timely submission of data and reports from individual institutions to the project coordinator;
- To assist the project coordinator in organizing various functions from time to time, including the preparation of reports and the organization of annual meetings; and
- To participate in annual meetings.

The Management of partners in NCRP will be responsible for control of funds and activities of their organizations;

Oversight/supervisory responsibilities of the execution of the tasks will be assigned to Chief Executives of the collaborating establishments over implementation and justification of funds.

4.3 Capacity Building

- Capacity building for project and network management for NC, ACs and Chairman of NCRP coordinating office;
- For all stakeholders- including Farmers, processors, technicians and scientists;
- Develop research capacities of NARIs and Universities by Information exchange, joint project and training including graduate training;
- Facility sharing in line with requirement of the NCRP; and
- Scientist development and mentoring scheme.

4.4 NCRP Project Identification and Evaluation

- Stakeholder analysis and identification;
- At national workshop, stakeholders should identify the priority research themes;
- Call for proposals;
- Proposals submitted to the steering committee by the Coordinator, collation and harmonization;
- Each NCRP will have a proposal evaluation and work plan development Committee;
- Steering committee to approve projects for execution; and
- Steering committee to evaluate and access work plans submitted to the ARCN Secretariat through its evaluation committee (Screening and Review at the ARCN).

4.5 Resolution of NCRP Project Implementation Issues

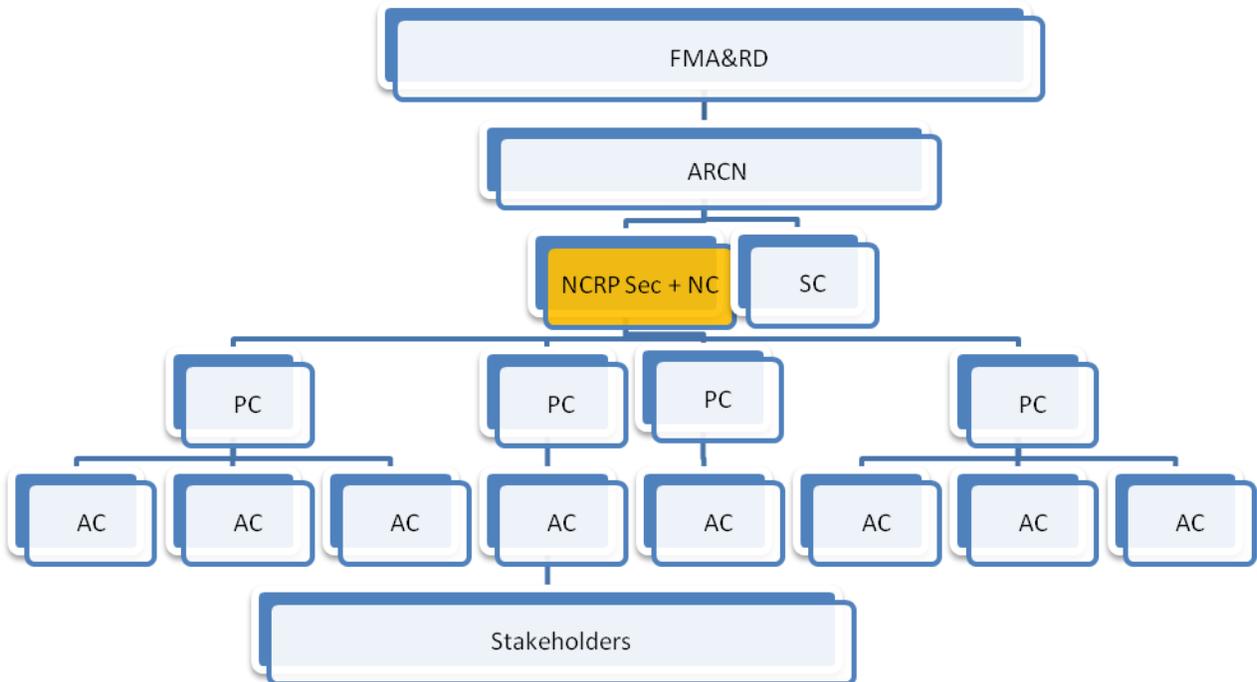
- Will emanate from constraints, most of which will be handled by M&E;
- Faithful application of M&E incorporated from beginning of implementation; and
- Conflict resolution to be oversight responsibility of SC and NCRP Coordinating Secretariat in the ARCN.

4.6 Roles and Responsibilities of other NCRP Operators and Stakeholders

- Mobilize all resources, (human and financial);
- Allocate tasks based on human resources capacities and spread of responsibilities;
- Ensure that all stakeholders align to a common interest;
- Participate in Joint planning and review sessions;
- Private Sector and consumer's Evaluation and Review of components of an NCRP to ensure adoption and commercialization of research results; and

- By Involvement in internal and external reviews.
 - Cost sharing
 - Capacity building e.g. internship

Recommended Organizational Structure for The New NCRP (NCRPIII)



4.7 Capacity gaps identification and strategy for building and deployment (including staff mobility within NARS, and between NARS and industry)

- Address emerging capacity gaps and needs through training and exposure to best practices;
- Encourage staff mobility between and within the NARS, through in-built remuneration; and
- Capacity gaps can be filled by outsourcing or direct employment.

5.0 COMMODITY NCRPs TO BE ESTABLISHED

38. Research Projects/topics should be developed by scientists based on the following guides to be widely circulated:

- NCRPs should cut across different sectors (crops, livestock & fisheries) and research should be demand-driven;
- However, there are cross-cutting issues which can serve as guide for each NCRP;
- Value chain approach should be used in arriving at the final topics, i.e., full range of activities that are required to bring a product or service from its inception to the final consumers should be put into consideration;
- Development and release of high-yielding improved crop varieties/livestock and fish breeds resistant to biotic and abiotic stresses;
- Development of integrated pest management practices;
- Development of improved resource management technologies/crop-livestock integration;
- Utilization of crops and livestock to diversify food products and improve human nutrition as well as the use of crop varieties to improve livestock nutrition; and
- Full integration of policy and socio-economic issues.

5.1 Expected Research Outputs

- Development of appropriate and cost-effective machinery for production and post-harvest processing;
- Analysis of existing marketing organization and distribution arrangements;
- Enhancement of human resources development within the Networks; and
- Assessment of adoption of technologies by farmers and impact of technologies on farmer's welfare and environment.

5.2 Priority 1 Projects

39. The NCRPs should be demand/market driven, while building partnerships and networks adopting the IAR4D concept. These are outputs that are mandatory for variety release in the country:

- Development and release of high-yielding improved crop varieties/livestock and fish breeds resistant to biotic and abiotic stresses. [Development of indigenous breeds of livestock;]

- Hybridization (using conventional and biotechnology applications) to incorporate desirable traits;
- Evaluation of existing and new segregating populations
- Multi-locational testing of elite crop varieties (and livestock/ fish breeds).

5.3 Priority 2 Projects

- On-farm evaluation of promising crop lines (by ADPs, National Crop-Based Centres (FDA) in collaboration with relevant NCRP)
- Breeder seed production (Breeder/Breeding Institution)
- Inventory of currently existing livestock breeds
- Development of feed standards for different livestock species/breeds
- Enhancement of human resources development within the network:
 - Annual Review and Planning Workshop of each NCRP
 - Organization of specialized training by NCRP
 - Attendance of training courses
 - Monitoring visits
 - Attendance of conferences

40. Based on the fore-going, the NCRPs should reflect the current commodity focus of the Federal Government with reference to the commodity value chain under the ATA:

- i. NCRP on cassava
- ii. NCRP on rice
- iii. NCRP on maize
- iv. NCRP on sorghum
- v. NCRP on wheat
- vi. NCRP on soybean
- vii. NCRP on sweet potato
- viii. NCRP on sugarcane
- ix. NCRP on cotton
- x. NCRP on Cocoa
- xi. NCRP on oil palm
- xii. NCRP on rubber
- xiii. NCRP on horticulture
- xiv. NCRP on ginger
- xv. NCRP on fisheries and aquaculture
- xvi. NCRP on dairy
- xvii. NCRP on beef
- xviii. NCRP on leather

- xix. NCRP on poultry
- xx. NCRP on Piggery
- xxi. NCRP on sheep and goats
- xxii. NCRP on agricultural extension
- xxiii. NCRP on policy and socio-economics research
- xxiv. NCRP on fertilizer and other agro-chemicals

6.0 FUNDING MECHANISMS OF THE NEW NCRPs STRUCTURE

6.1 Funding stream – portfolio/windows

- FGN – ARCN to have a budget line for NCRPs, all research institutes to designate budget lines for NCRPs;
- WAAPP – source of funding for the NCRPs;
- CGIAR Centres- align our research programs with their priority research themes in our national programs to attract funding e.g. Africa Rice Task Forces;
- Multinational cooperation e.g. BMGF – fortified sorghum, cowpea, rice, cassava, dairy for improved nutrition;
- AATF – Nitrogen efficient rice, water efficient maize and other AATF-supported projects;
- Sourcing funds from the Private Sector in the areas of interest of the companies/industries/Associations (e.g. Cassava flour. Palm oil, dairy, poultry, fruit juices, mechanization, etc);
- Cooperation with States Government (e.g. facilities/funding);
- A percentage of the administrative charges for externally funded projects by Research Institutes to be devoted to NCRPs;
- Percentage of IGR of NARIs should be devoted to NCRPs;
- Percentage Levy on imported commodities (e.g. Rice levy and Sugar Levy) to be devoted to NCRPs; and
- Commercialization of products to generate funds for NCRPs.

6.2 Advocacy Strategy, including key stakeholders capacity building and skills development

- Set up a Private Sector led advocacy group
- ARCN Board Chairman to lead Advocacy group to the members of National Assembly
- Engage the Private sector - NACCIMA, Farmers' Association, MAN, etc for Advocacy
- ARCN and/or RIs through collaboration with organizations such as IFPRI and other CGIAR centres, Universities, USAID, DFID, IFAD, CIDA, JICA, CORAF/WECARD, FARA, NCAM, ARMTI, etc to assist in capacity building for stakeholders

6.3 Capacity Issues in Financial Management of NCRP- Strategies for its Management

- NCRP to operate separate account at various institutions with a dedicated account officer;
- ARCN to organize training for the accounts and procurement officers to ensure compliance with financial regulations and procurement guidelines;
- Strict adherence to financial discipline and prudence should be adhered to; and
- Timely submission of Statement of Expenditure (SOE) to ARCN to ensure early release of funds.

7.0 IMPLEMENTATION ARRANGEMENTS

41. The design of the proposed implementation strategy was premised on certain elements as follows:

➤ **Strategy Instrumentation**

- Conventional instruments for managing research policy – technology generation and dissemination; research grant schemes; land grant system of education;
- Contemporary instrument of IAR4D - innovation platforms; policy; markets; capacity strengthening, coordination, advocacy, knowledge management, stakeholder participation; and
- Other instruments - Policy advocacy and brokering services for delivering and commercializing research results; Intellectual property management.

➤ **Strategy Formulation and Appraisal**

- Formulation of strategies for implementation of specific NCRPs;
- SWOT analysis and needs assessment of specific NCRPs; and
- Supervision and review of specific NCRP implementation modalities.

➤ **Strategy Implementation**

- Institutional restructuring for effective implementation;
- Resource Requirement and Financial Implications; and
- Work Plan and Logical framework of implementation.

7.1 Key strategic goals for NCRP, targets and milestones (2014– 2016)

42. The strategic goals of NCRPs should be in tandem with the policy thrust of the Federal Government of Nigeria and global perspectives:

- a. To contribute to improved food security, agricultural growth, employment, farmers' income and reduced poverty in Nigeria,
- b. Foster coordinated collaboration among stakeholders for the purpose of development, adaptation, adoption, promotion and utilization of improved agricultural technologies in Nigeria.

43. The specific objectives are:

- i. Sustainable increase in agricultural productivity and production;

- ii. Enhance capacity of the National Agricultural Research and Extension System to conduct needed and relevant research for development; and
 - iii. Promote sustainable and holistic well coordinated agricultural research system in Nigeria.
- 44.** In this context, the targets and milestones for NCRPs are specified as follows:
- *Contribute to GDP by at least 1.5%, and to saving over \$US 900 million, through import reduction by 2018;*
 - *Enhance agricultural productivity by at least 25% through adopted improved crop varieties, livestock/fish breeds and production technologies;*
 - *Ensure training of researchers (>1,500 researchers); and*
 - *Lead to better informed and skilled household families and other stakeholders (>1,500,000 farmers).*

7.2 Criteria for NCRP Priority Setting and Project Identification

a. Criteria

- Emphasis on commodities with high food and commercial values;
- Commodities with high import substitution potentials; and
- Commodities with high export potentials.

b. Project identification and prioritization (NCRPs)

Commodities of Top priorities (T) should be in the short-term plan of the NCRPs (2014 – 2016), while commodities of Normal priorities (N) should be in the medium- to long-term plan (2016 - 2020).

- i. Commodities with staple status (food values):** Maize (T), Sorghum (T), Millet (N), Cassava (T), Yam (T), Cowpea (N), Cattle (T) and Small Ruminants (N)
- ii. Commodities with high commercial values:** Groundnut (N), Cotton (T), Soybean (T), Horticultural crops (T), Medicinal crops(N)
- iii. Commodities with high import substitution potentials:** Rice (T), Wheat (T), Sugarcane (T), Poultry (T), Aquaculture (T), Dairy (T), Feeds and Feed Resources (T)
- iv. Commodities with high export potentials:** Cocoa (T), Rubber (T), Oil palm (T), Sesame (N), Ginger (N)

7.3 Key roles and responsibilities of Institutions

7.3.1 Agricultural Research Council of Nigeria (ARCN)

- Responsibility to oversee and coordinate the implementation of all the NCRPs
- Constitute a Management Steering Committee for the entire NCRPs
- Appointment of National and Joint Coordinators in consultation with mandate NARIs
- Provision of strategic plan for agricultural research (short, medium and long terms) in collaboration with relevant stakeholders
- Benchmarking and regular monitoring of activities/impact assessment.

7.3.2 Research Institutes (RIs)

- Hosting the NCRP office
- Identification of the Stakeholders in the NCRPs
- Implementation of NCRPs domiciled in the Institute
- Sharing of materials and human resources, as well as newly generated information
- Organize annual planning and review meetings

7.3.3 Universities of Agriculture/Faculties

- Implementation of assigned tasks by the NCRP
- Human capacity development of project-involved staff and stakeholders

7.3.4 International Agricultural Research Centres (CGIAR)/NABDA /NACGRAB

- Implementation of assigned tasks by the NCRP
- Laboratory and hi-tech services and capacity building

7.3.5 Federal Colleges of Agriculture/Polytechnics/Monotechnics

- Human capacity development and implementation of tasks

7.3.6 Private Sectors (NGOs/Industries)

- Provide research direction and uptake of research products
- Participate in planning and implementation of the NCRPs
- Commercialization of research outputs
- Undertake R&D in industry

7.3.7 ADPs and Federal Department of Extension

- Implementation of OFAR and Extension

7.4 Development Focus, Targets and Deliverables for NCRPs

- a. Enhancement of crop, livestock and fishery productivity through the deployment of improved varieties/breeds and production packages
 - At least 5 varieties each of target arable crops with 25-30% yield advantage released and disseminated by 2018
 - At least 2 lines each of poultry, cattle, sheep and goat with 25-30% increase in meat, egg and milk developed by 2018
 - At least 1 new breed of *Tilapia* with 50% weight increase released and disseminated.
- b. Promotion of sustainable production systems and eco-friendly conservation agriculture.
 - Detailed soil (fertility) map of Nigeria by 2016.
- c. Conduct post-harvest and socio-economics, adaptive research and develop a virile seed (crop, livestock and fisheries) system with private sector participation
 - Baseline survey for all project commodities by 2013 -2014.
- d. Development of PPP in the prevention and control of trans-boundary and zoonotic animal diseases
 - Development of 5 potent vaccines against trans-boundary and zoonotic diseases, up-scaled current production capacity by 95% by 2018.
- e. Development of Integrated Pest Management practices
 - Development of IPM package for each commodity (including pesticide research) by 2016.
- f. Development of appropriate and cost-effective machinery for production and post-harvest processing (value addition, product development and packaging)
 - Development of 3 relevant prototypes of medium scale wheat flour mills, fruit and fish driers by 2015.
- g. Conservation, characterization and utilization of genetic resources for food and agriculture

- Development of 1 standard National Gene-bank and Catalogue of genetic resources for food and agriculture by 2016.

7.5 Private-Public Partnerships models for NCRPs development and commercialization strategies

- Joint Programming Initiatives, demand driven research/product and IPR for commercializable technologies.

7.6 Human capacity development needs for NCRPs, capacity gaps and mitigation strategy

Capacity development need strategy	Capacity gaps	Mitigation
Breeding and biotechnology Training	Higher degree	Graduate
Proposals and Scientific writing W/shop	Short Courses	Training
Data and information management W/shop	Short Courses	Training
Satellite and imaging W/shop	Short Courses	Training
Skill development (biotech etc) NCRP Young Scientist Involvement (30%) Gender sensitivity (30%)	Mentoring	Lab. Attachment

7.7 *The role of ARCN in training for NCRP implementation*

45. The ARCN Act specifically provides that the Council shall advise the Federal Government on national policies and priorities in agricultural research, training and extension activities. It is also expected to coordinate annual budget and maintain up to date records of all existing facilities for research training and extension in the agricultural sciences in Nigeria and advise the Federal Government on their adequacy and efficient utilization. The National Agricultural Research Institutes being coordinated and supervised by the Council discharge their training mandates through the Federal Colleges of Agriculture affiliated to them. The Colleges provide middle level manpower training.

46. As an apex body therefore, the Council must discharge its mandates efficiently as noted above. To achieve this it must not only supervise and coordinate the Federal Colleges of Agriculture but must also promote and facilitate various other forms of

training in doing so. Specifically, the Council must develop capacity for training in agricultural research management. The areas of training would be mainly agricultural research management, research commercialization and technology transfer, managing for impact, impact assessment, monitoring and evaluation, science communication skills, leadership and conflict resolution skills among others. ARCN can strengthen and develop core staff with such skills that will serve as facilitators and or provide the training in partnership and collaborative arrangement with other competent and skilled agencies.

7.8 Roadmap to NCRP Implementation

7.8.1 Suggested Next Steps:

- A One day Stakeholder/Civil Society focused Consultative Meeting to draw attention of critical stakeholders and draw support for the proposed NCRPs;
- Constitution of the new NCRP themes and teams;
- Drafting of Projects Document;
- Formulation of strategies for implementation of specific NCRPs;
- SWOT analysis and needs assessment of specific NCRPs;
- Supervision and review of specific NCRP implementation modalities;
- Institutional restructuring for effective implementation;
- Work Plan and Roles;
- Resource Requirement and Financial Implications;
- Creation of an E-discussion platform among researchers for obtaining views of all relevant scientists in decision making;
- Validation workshop to review the emerging draft Project Document;
- Identification and listing of priority research projects in each sub-sector;
- Identification of lead NARIs with national mandates;
- Identification of collaborating institutions (universities, other NARIs, IARCs, Organizations and Agencies within the FMA&RD, and the private sector, with capacities and willingness to participate in the programs;
- Appointment of Project Coordinators (PCs) (staff of NARIs with national mandate) and Joint Coordinators (JCs);
- Establishment of monitoring committee for each sub-sector; and
- Strengthening of the secretariat to the National Variety Release Committee (NVRC) for hosting of effective coordination meetings and field visits o trials.

7.8.2 Linking NCRP I and NCRP II with NCRP III

47. There is a strong need to link relevant results obtained in the previous NCRPs with on-going strategic problems in the sector. This is to be achieved through contacts with especially on-going and active research activities relevant to priority projects to be identified for NCRPIII.

8 SUSTAINABILITY OF NCRPs

8.1 Elements of Sustainability

1. Financial – As obtained above in funding stream
2. Non – financial (program sustainability)
3. Enabling environment for research and addressing Security issues
4. Infrastructure – human capacity and functional facilities

8.2 Strategies for Sustainability

1. Documentation
2. MoU / Agreement document, etc
3. Accountability
4. Transparency
5. Due process
6. Capacity strengthening for coordination

8.3 Sanctions (penalties and incentives))

8.3.1 Penalties

1. Review the terms of agreement in line with the MoU/Agreement
2. Refund the project funds
3. Warning in writing
4. Termination of the contract
5. Litigation

8.3.2 Incentives

1. Commendation in writing
2. Award
3. Continuity of contractual relationship

8.4 IPR Issues and Management

1. Existing IPR Guidelines ARCN developed should be fast-tracked and made operational
2. ARCN to strengthen IPR Unit for effective operation to realize benefits and royalties
3. Royalties accruing from the IPR should be deployed back to NCRP

8.5 Commercialization

1. Development of business models
2. Entrepreneurship and enterprise management capacity building
3. Prototyping and demonstration of research findings
4. Development of Information, education and communication (IEC) materials about research results

8.6 Advocacy and Brokering Services (including key stakeholders, capacity building and skills development)

1. Identify professional policy advocacy and brokering service providers in agricultural research
2. Set up a Private Sector led advocacy group
3. ARCN Board Chairman to lead Advocacy group to the members of National Assembly
4. Engage the Private sector - NACCIMA, Farmers' Association, MAN, etc for Advocacy
5. ARCN and/or RIs through collaboration with organizations such as IFPRI and other CGIAR centres, Universities, USAID, DFID, IFAD, CIDA, JICA, CORAF/WECARD, FARA, NCAM, ARMTI, etc to assist in capacity building for stakeholders

8.7 Partnership Arrangement (Partnerships and linkages policy for successful NCRP)

- Key stakeholders (e.g. commodity association, agricultural NGO, agro-processing industry, etc) and Commodity Associations should be represented on the steering committee to help in promoting linkages
- Annual Public presentation of NCRP activities and results
- Maintain data base of stakeholders and possible collaborators
- Delegation of partnerships will be by MoUs
- Linkages with advanced laboratories guided by SC
- Promotion of Public - Private Partnerships based on new technologies
- Invitation to the stakeholder's meetings should target key partners and interest groups

8.8 Interactions

- Annual review and planning meetings at by NCRP
- Promotion of interactions through annual review and planning meetings
- Building stakeholder's capacity for advocacy and to drive research agenda through exposure and training, exchange of information and materials and staff movement for special task and team work

9 INFRASTRUCTURE AND EQUIPMENT REQUIREMENT

48. Critical among the facilities required to bring the laboratories and infrastructure to acceptable minimum standards includes, but are not limited to the following:

Infrastructure:

49. These include laboratory buildings, screen/glass houses, crossing nurseries/chambers, seed storage facilities, alternative power sources, library buildings, animal pens, hatcheries, fish ponds, barns, cryopreservation facilities, milking parlours, paddocks, containment/confinement facilities, water supply, and perimeter fencing to safe guard encroachment, etc.

Equipment:

50. Equipment refers to those tools used to conduct research, usually kept in laboratories. They could also include field equipment. Common examples of required equipment are amino acid analyzers, atomic absorption spectrophotometers, flame photometers, autoclaves, weighing balances, microscopes, irrigation facilities, pumping machines, artificial insemination equipment, milking parlour equipment, liquid nitrogen plants, automated weather stations, e-library, farm machinery and equipment, etc.

51. A needs assessment was carried out in the past indicating the facilities required to upgrade the infrastructure and equipment status of NARIs (see Tables 2&3 below).

Table 2: INFRASTRUCTURE AND EQUIPMENT UPGRADE FOR THE NARS – LOTS STRUCTURE (PHASE 1 -2009)

S/NO.	LOT NO.	JOB DESCRIPTION	INSTITUTION	ESTIMATED COST (₦)
1	1	Completion of Ultra-modern International Conference Auditorium, including Acoustic Finishing	ARCN	35, 000, 000
	2	State-of-the-art Furnishing of Ultra-modern Conference Auditorium	ARCN	30, 000, 000
	3	Procurement of Simultaneous	ARCN	10, 000, 000

		Translation Conference Equipment		
	4	External / Internal Landscaping and Fencing	ARCN	45, 000, 000
	5	Provision and Installation of Elevator	ARCN	30, 000, 000
			Sub-total	150, 000, 000
2	6	Rehabilitation and Upgrading of Liquid Nitrogen Plant	NAPRI	80, 000, 000
	7	Renovation of Artificial Insemination Infrastructure	NAPRI	20, 000, 000
	8	Procurement and Installation of New Milking Machine	NAPRI	50, 000, 000
			Sub-total	150, 000, 000
3	9	Upgrading of Laboratories and Green Houses	NRCRI	50, 000, 000
	10	Procurement and Installation of Critical Laboratory Equipment	NRCRI	70, 000, 000
	11	Water Provision and Reticulation at FCA, Ishiagu	NRCRI/FCA	50, 000, 000
			Sub-total	170, 000, 000
4	12	Construction of Block of Class rooms at Badore Research Station for Training of Farmers and Young School Leavers in Aquaculture	NIOMR	50, 000, 000
	13	Construction of Hostel Accommodation for Training young School Leavers	NIOMR	10, 000, 000
	14	Renovation of Specialized Aquaculture Laboratory	NIOMR	10, 000, 000
	15	Completion of Accommodation for Visiting Scientists	NIOMR	70, 000, 000
			Sub-total	140, 000, 000
5	16	Renovation of Seed Store	NIFOR	18, 000, 000
	17	Renovation of Entomology Laboratory	NIFOR	20, 000, 000
	18	Construction of Screen-house with Net for Dutse Sub-station	NIFOR	15, 000, 000
	19	Renovation of residential quarters and Fencing of Dutse Sub-station	NIFOR	50, 000, 000
	20	Procurement of Essential Laboratory Equipment	NIFOR	17, 000, 000
			Sub-total	120, 000, 000
6	21	Procurement of Multirace (150 p/min) Pouching Machine	NIFFR	25, 000, 000
	22	Procurement of three (3 no.), 20 seater research flat bottom fibre glass	NIFFR	10, 000, 000

		boats for Survey of Water Bodies		
	23	Construction of Tanks and Procurement of Assorted Experimental Equipment	NIFFR	15, 000, 000
			Sub-total	50, 000, 000
7	24	Completion of Skill Acquisition and Development Centre	NAERLS	80, 000, 000
	25	Equipping of Skill Acquisition and Development Centre	NAERLS	20, 000, 000
			Sub-total	100, 000, 000
8	26	Ultra-modern State-of-the-art Gene bank	NIHORT	25, 000, 000
	27	Construction of Mushroom Laboratory	NIHORT	10, 000, 000
	28	Procurement of Assorted Laboratory Equipment	NIHORT	30, 000, 000
	29	Upgrade of Dilapidated Infrastructure at Bagauda Sub-station	NIHORT/FCH	15, 000, 000
	30	Construction of Laboratory Complex at FCH, Dadin-Kowa	NIHORT/FCH	17, 000, 000
	31	Construction of Auditorium at FCH, Dadin-Kowa	NIHORT/FCH	23, 000, 000
			Sub-total	120, 000, 000
			GRAND-TOTAL	1, 000, 000, 000

Table 3: **INFRASTRUCTURE AND EQUIPMENT UPGRADE FOR THE NARS – LOTS STRUCTURE (PHASE II -2010)**

S/NO.	LOT NO.	JOB DESCRIPTION	INSTITUTION	ESTIMATED COST (₦)
1	1	Upgrade of agricultural library	IAR, ZARIA	25,000,000
	2	Upgrading of biotechnology laboratory	IAR, ZARIA	25,000,000
	3	Rehabilitation of general laboratories	IAR, ZARIA	30,000,000
	4	Rehabilitation of Green houses	IAR, ZARIA	30,000,000
	5	Upgrade of Agric engineering photo type department	IAR, ZARIA	20,000,000
			Sub-total	130,000,000
2	6	Upgrade of laboratories	IAR & T, IBADAN	30,000,000
	7	Upgrade of Institute library	IAR & T, IBADAN	10,000,000
	8	Renovation of paddocks and animal pens	IAR & T, IBADAN	10,000,000
	9	Procurement of essential library equipment	IAR & T, IBADAN	45,000,000
			Sub-total	95,000,000
3	10	Upgrade of engineering research laboratories	NSPRI, ILORIN	30,000,000
	11	Reroofing of laboratories in NSPRI Lagos	NSPRI, ILORIN	10,000,000
	12	Furnishing of biotechnology and standard quality laboratories in Ilorin	NSPRI, ILORIN	20,000,000
	13	Liquid nitrogen plants for the headquarters and substations	NSPRI, ILORIN	60,000,000
	14	Procurement and upgrading of essential laboratory equipment	NSPRI, ILORIN	30,000,000
			Sub-total	160,000,000
4	15	Replacement of obsolete equipment	CRIN, IBADAN	20,000,000
	16	Upgrade of infrastructure in winery and chocolate processing unit	CRIN, IBADAN	20,000,000
	17	Upgrading of technology and tissue culture laboratory	CRIN, IBADAN	40,000,000
			Sub-total	80,000,000
5	18	Upgrade of greenhouse and value addition centres	LCRI, MAIDUGURI	25,000,000
	19	Procurement of essential laboratory equipment	LCRI, MAIDUGURI	15,000,000
			Sub-total	40,000,000

6	20	Rehabilitation of 2no. seed stores	NCRI, BADEGGI	20,000,000
	21	Provision of 2no. additional green houses	NCRI, BADEGGI	40,000,000
	22	Upgrading of research and experimental fields of various mandate crops	NCRI, BADEGGI	20,000,000
	23	Upgrading of laboratories	NCRI, BADEGGI	20,000,000
	24	Procurement of essential laboratory equipment	NCRI, BADEGGI	30,000,000
			Sub-total	130,000,000
7	25	Procurement and installation of mechanical analyzer	RRIN, IYANOMO	55,000,000
	26	Procurement and installation of gel permeation chromatographic equipment (GPC): model automated triple detector HT-GPC system	RRIN, IYANOMO	50,000,000
	27	Dispersion Kneader for rubber for rubber 25-30 kg capacity	RRIN, IYANOMO	10,000,000
	28	2-roll mixing mill for rubber (roll size 14 x 36)	RRIN, IYANOMO	15,000,000
	29	Natural latex centrifuge machine (model LRB710)	RRIN, IYANOMO	35,000,000
			Sub-total	165,000,000
8	30	Type culture collection centre/Gene bank	NVRI,VOM-JOS	50, 000, 000
	31	Viral Vaccine Production Laboratory	NVRI,VOM-JOS	45,000,000
	32	Heavy duty autoclaves for research	NVRI,VOM-JOS	10,000,000

		and vaccine production		
	33	Ultra low -80 °C freezer	NVRI,VOM-JOS	30,000,000
	34	Liquid nitrogen storage tanks	NVRI,VOM-JOS	10,000,000
	35	Biosafety cabinets (Baker, 6 feet 4 feet types) for research and vaccine production	NVRI,VOM-JOS	30,000,000
	36	Egg incubators for vaccine production	NVRI, VOM – JOS	15, 000, 000
	37	Incubators for research and vaccine development	NVRI, VOM - JOS	10, 000, 000
			Sub-total	200,000,000
			GRAND – TOTAL	1,000,000,000

52.

10.0 MONITORING AND EVALUATION

10.1 Guiding principles for M&E

53. The new NCRPs' would adopt Results-Based Monitoring and Evaluation (RBME) for all its activities. The Policy and Strategy for the RBME should be guided by the following principles:

- **Policy:** M & E to be carried out in the entire NCRP process to guarantee initial good planning (formulated around all inclusive base-line study), accountability and sustainability for the project.
- **Strategy:** There should be a dedicated M & E Officer (with clear Terms of Reference (TOR) which will serve as indicator for this strategy).
- **RBME –Key indicators, format contents and key deliverables to be developed at different stages -**
 - Planning stage - Indicators for the first or planning stage is development of **Issue note/draft of work plan** with not less 95% success rate as the benchmark
 - Implementation Stage – Input indicators. At the implementation stage, the primary indicator is: all projects are executed following specified designs/protocol laid in the work plan. It is expected to capture budget line, timeliness, with full collaboration of stakeholders identified at phase 1.
 - Result Stage – Output indicators, Outcome indicators, Impact indicators. At the result (**Outcome**) stage, indicators are: All relevant data are collected; Log books and data are retrieved on time; Data processing followed standard procedure
 - a) At the **Output** stage, indicators are: Level of knowledge gap filled is more than 75%; % accomplishment against set goals is identified. The Immediate/Intermediate Impact stage indicators will reflect on: Number of users of technology; Users'

perception (i. e. replacement of existing technology) and uptake of technology; Productivity gain to the neighbourhood from project implementation

10.2 NCRP Reporting

10.2.1 Reporting frequency:

- Quarterly for the NARIs, in both soft and hard copies to ARCN; and annual for ARC
- Each NCRP commodity to also produce annual report (technical) on each NCRP

10.2.2 Analysis and synthesis of reports at 2 levels:

- By NCRP coordinator of incoming field reports
- By ARCN of all submission from the NCRP Coordinators

10.3 NCRP Communication Strategy - Target audience, Format and Media

10.3.1 Strategy:

- Appoint Communication specialist for each M&E office (Hq – ARCN, & each NARI)
- Establish website for NCRP under ARCN or use the ARCN site, but create windows NRP and for each NCRP
- Newsletters (even for each NCRP), in both soft and hard copies
- Communication expert with flair for journalism at ARCN

10.3.2 Target audience:

- Primary: Farmers, processors, marketers, consumers, researchers
- Secondary: Policy makers, development partners (donors)

10.3.3 Format and Media:

- Internet, newspaper, electronic (radio & TV),
- Newsletters, advisory guides, & documentaries
- ARCN to organise networking platform for scientists participating in the project (NCRP)

10.3.4 NCRP Evaluation - Scientific and non-scientific evaluation and reviews and roles of actors and stakeholders

- Scientific:
 - Seed out – National Academy of Science (NAS) suggested
- Non-scientific:
 - Generate from reports of the M&E units and farmers’ association

10.4 Capacity building issues in monitoring and evaluation, communication and reporting

- Training of all M&E officers and Communication officers.
- All inclusive in-house training of scientists on protocols and M&E
- Training of all scientists in data management

10.5 Knowledge management strategy – Data quality, data security and management and confidentiality.

- Training of stakeholders in proper data collection, processing, handling and safe keeping of data log books
- Establish data management office at ARCN
- This office will additionally manage the information system for the project

10.6 Advocacy strategy including key stakeholders capacity building and skills development

- Strategy:
 - Website, facebook, twitters (& other social network portals)
 - Set up an advocacy consortium
 - Communication group to develop 15 – 30 minutes documentary on gains of ARCN intervention/approach, citing examples from other countries (Africa in particular) at advocacy outings
 - Sensitization workshops (at least twice a year) for secondary stakeholders in particular.

10.7 Logical framework

Logical Framework of NCRP Strategy Implementation			
Objectives	Key performance indicators	Means of verification	Underlying assumptions
<i>Impact (Goal):</i>			
Contribute to improved	• Contribution to	Data work from	ATA will be

food security, agricultural growth, employment, farmers' income and reduced poverty in Nigeria	<p>GDP</p> <ul style="list-style-type: none"> • Contribution to agricultural growth • Contribution to employment • Contribution to farmers income 	FBS Data work from CBN	<p>implemented on sustained basis</p> <p>Agricultural research will be government priority on a constant basis</p>
<i>Outcome (Purpose):</i>			
Foster coordinated collaboration among stakeholders for the purpose of development, adaptation, adoption, promotion and utilization of improved agricultural technologies in Nigeria	<ul style="list-style-type: none"> • Joint research activities • Improved technology generation and Uptake 	<p>Publications</p> <p>Policy briefs</p> <p>Commercialization of technologies</p> <p>Scientific meetings</p>	<p>No industrial action by staff unions</p> <p>Improved funding of research is sustained</p>
<i>Outputs (Aims):</i>			
Sustainable increase in agricultural productivity and production	<p>Increased yield per unit area on farmers' fields</p> <p>Increased value addition to agricultural produce</p> <p>Increased contribution of agriculture to GDP</p> <p>Improved livelihood of farmers</p> <p>Value added products</p> <p>Food security</p>	Surveys; Official publications	<p>Top priority attached to agriculture by policy authority</p> <p>Favourable agricultural policy is maintained</p>
Enhanced capacity of the National Agricultural Research and Extension System to conduct needed and relevant research for development	Improved technology generation and adoption in terms of Number of technologies generated and adopted; Number of Research/ Extension staff trained.	Regular accreditation exercise	<p>Strong ARCN exists</p> <p>Research remain government priority</p>

	Increased capacity to conduct advanced research in terms of improved Staffing improved Funding and improved Infrastructure		
Promote sustainable and holistic well-coordinated agricultural research system in Nigeria	<p>Duplications minimized in research and operational activities; Improved synergy among the NARS - Number of coordinated research projects; Number of organizations networking in each coordinated project</p> <p>Well-funded and Coordinated research - Amount of funds allocated to research</p>	Management observations	Good management of NARS; Adequate funding of coordinated research maintained
<i>Inputs (Activities):</i>			
Establishment of the management and structure for the NCRPs	<ul style="list-style-type: none"> • Creation of a governance structure, authority and approvals system • Capacity building activities undertaken • NCRP Projects identified and evaluated • Resolution of NCRP Project Implementation Issues • Roles and Responsibilities of 	Direct observation	Commitment to implementation process

	<p>other NCRP operators and stakeholders</p> <ul style="list-style-type: none"> • Capacity gaps identification and strategy for building and deployment 		
Identifying the commodity NCRPs to be established	<ul style="list-style-type: none"> • Expected Research Outputs defined • Identification of Priority one (1) Projects • Identification of Priority two (2) Projects 	Records of ARCN and institutes	Proper management of NCRPs and good records system
Funding of the new NCRPs structure and functions	<ul style="list-style-type: none"> • Funding stream – portfolio/windows established • Advocacy strategy including • Capacity issues in financial management 	Financial audit	More funds will be provided
Implementation arrangement	<ul style="list-style-type: none"> • Key strategic goals for NCRP, targets and milestones (2014-2016) • Criteria for NCRP priority setting and project identification • Key roles and responsibilities of Institutions • Development focus, targets and deliverables for NCRPs • Private-Public Partnerships models for NCRPs development and commercialization 	Supervision missions	

	strategies <ul style="list-style-type: none"> • Human capacity development needs for NCRPs, capacity gaps and mitigation strategy • The role of ARCN in training for NCRP implementation • Roadmap to NCRP implementation 		
Taking sustainability measures	<ul style="list-style-type: none"> • Sanctions (Penalties and Incentives) • IPR issues and Management • Commercialization • Advocacy and Brokering Services including key Stakeholders capacity building and skills development • Partnership Arrangement (Partnerships and Linkages Policy for Successful NCRP) • Interactions 	Regular reporting	Proper management
Provision of infrastructure and equipment requirement	Incremental infrastructural facilities	Infrastructure survey	Fund will be available
Monitoring and Evaluation	Number and regularity of M&E activities	Monitoring and evaluation studies	Role of technical back up activities will be appreciated by management