UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

Project for the Governments of Ghana, Nigeria and Sierra Leone

Project Title	Promotion of neem-derived bio-pesticides in West Africa
SAP ID	100110
Relationship to Integrated programme Thematic area code	EC3 – Stockholm Convention Unit
Starting Date	January 2014
Duration	36 months
Project site	**Ghana**: (i) Ghana University Institute of Agricultural Research, Accra (ii) Tropical Agricultural Marketing & Consultancy Services (TRAGRIMACS) **Nigeria**: (i) Ahmadu Bello University, Zaria, Kaduna State (ii) College of Agriculture, Hassan Usman Polytechnic, Katsina State and Neem Links, Non-governmental Organization, Katsina **Sierra Leone:** (i) Njala University, Moyamba district (ii) National Federation of Farmers, Waterloo
Government Co-ordinating agency	**Ghana:** Ministry of Agriculture **Nigeria:** Ministry of Environment **Sierra Leone:** Ministry of Environment
Counterpart	
Executing agency/ cooperating agency	UNIDO Centre for South-South Cooperation (UCSSIC), India and Regional Network for Pesticides in Asia and the Pacific (RENPAP), India
Project inputs:	
UNIDO (UCSSIC) inputs	USD 275,000
Support costs (13%)	USD 35,750
TOTAL UCSSIC	***USD 310,750***
Counterpart inputs	RENPAP: USD 75,000 (in-kind) Ghana: USD 75,000 (in-kind) Nigeria: USD 75,000 (in-kind) Sierra Leone: USD 75,000 (in-kind)
GRAND TOTAL	**USD 610,750**

Brief description:

The programme is aimed at promoting the use of and development of production capacity of eco-friendly and cost-effective pesticide derived from neem kernels in three countries of West Africa – Ghana, Nigeria and Sierra Leone.

This would be achieved through neem-shed area development, transfer of appropriate technology, south-south institutional linkages, skill enhacement and training at the village level for rural development, agri-business and micro-industries promotion, poverty alleviation and employment generation, while at the same time strengthening environmental protection and elimination of health hazards by providing a low-cost bio-efficient alternative to toxic POPs and non-biodegradable chemical pesticides, and supporting organic food production.

In this pilot phase, one neem-shed area in each country will be developed, and Neem Centres established to function as a demonstration, production and promotion centre of neem kernel derived bio-pesticides based on aqueous extraction (NKAE) technology, which has been perfected in India and now popularized in the network of 17 countries of Asia and the Pacific, which are members of RENPAP. This would be backed up by an academic R&D institution in each country that will be strengthened to carry out bio-efficacy and phyto-toxicity studies to determine country-specific agro-climatic specific dosages and other necessary scientific data.

Eventually, the mechanized production technology could be transferred to the agro-industries / pesticide industry in West Africa for production of packaged neem-kernel powder with long shelf-life through commercial ventures. The project also aims at eventually establishing a regional network no pesticides in West Africa of initially three countries namely Ghana, Nigeria and Sierra Leone modeled on and linked to RENPAP.

Approved	**Signature:**	**Date:**	**Name and Title:**
On behalf of *The Government of:*			
Ghana	_____	_____	_____
Nigeria	_____	_____	_____
Sierra Leone	_____	_____	_____
On behalf of UNIDO:	_____	4/3/2014	Akmel Prosper Akpa UNIDO AMC Chairman

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A. CONTEXT

A.1 Origin of the Project

During the formal launch ceremony of the *UNIDO Centre for South-South Industrial Cooperation (UCSSIC)* in New Delhi, in February 2007 the Director General of UNIDO in his inaugural address flagged the neem-based bio-pesticides project implemented in India by the *Regional Network on Pesticides for Asia and the Pacific (RENPAP)* as an innovative, sustainable, low cost technology, suitable for widespread adoption by other developing countries through the framework of south-south cooperation.

At the instance of the Director General, UNIDO, an Expert Group Meeting (EGM) was organized at Abuja, Nigeria in November 2007 at which the Indian model of neem-derived pesticide technology was presented and discussed at length. The EGM recommended that the Indian technology of Neem Kernel Aqueous Extract (NKAE) for pesticides developed and promoted by RENPAP, and the model of farmer-training developed in India and replicated in several Asian countries, should be adopted in West African countries, for wide application especially by resource poor farmers, and that this technology transfer and training could be effected through south-south cooperation mechanisms.

As a consequence, a joint UCSSIC-RENPAP mission was undertaken to Sierra Leone and Ghana in December 2010 and to Nigeria in April 2011, during which wide-ranging discussions were held with various government ministries, technical institutions, universities, farmers' federations, civil society organizations, federal, regional and local government departments, and industry associations. The interest and the enthusiasm shown by all stakeholders, as well as the readiness to make commitments to in-kind contributions showed that the project proposal responds to a felt need and is demand –driven.

A.2 Challenges to be addressed

Developing countries wage a perpetual uphill battle to produce sufficient food for their growing populations and at the same time, to gain economic independence. Future increases in agricultural production must come from increased crop yields per hectare, relying on increased use of fertilizers and pesticides. The bulk of such agricultural inputs are chemicals, which often result in soil, water and food contamination, posing severe dangers to human health and the environment.

Assistance is required to help countries promote the use, and develop production capacity, of cost-effective eco-friendly alternatives to POPs pesticides, through emphasis on non-chemical alternatives such as neem derived bio pesticides. The overall objective of this regional demonstration project is to pave the way for low cost, safe, economical, and environmentally-sound approaches to alternative pesticides.

Neem (*azadirachta indica*) is an evergreen tree native to the Indian sub-continent, and can grow in almost all types of soils and agro-climatic conditions. It is now widespread in many African countries as well, having been imported there from India during colonial times. It is adapted to temperatures as high as 48° C and as low as 0° C, on altitudes up to 1500 m and to rainfall as low as 250 mm. Traditionally used for various purposes in South Asia, *Azadirachta indica* was classified in 1989 by the US National Research Council as a "tree for solving global problems", (*"Alternative Agriculture" Committee on the Role of Alternative Farming Methods in Modern Production Agriculture, National Research Council 1989)* and the chemicals present in this tree can serve as models for environmentally sound pesticides. It has been regarded as a 'Wonder Tree', with a vast range of medicinal properties, and products derived from this tree can be used by farmers as eco-friendly pesticides.

If the potential of the neem tree is adequately tapped, there is great scope for generating additional income and employment opportunities in rural areas besides reclamation of vast barren wastelands. *Generally people use the leaves and bark of the tree. The technology sought to be propagated in this project makes use of the neem kernel which is more than twenty times as potent as the leaves insofar as active ingredients relevant to pesticidal properties is concerned.*

A joint UCSSIC-RENPAP Preparatory Mission was undertaken to Sierra Leone and Ghana in December 2010 and to Nigeria in April 2011, during which wide-ranging discussions were held with various government ministries, technical institutions, universities, farmers' federations, civil society organizations, federal, regional and local government departments, and industry associations, and also several site-visits made to various locations in the field.

It was observed that all three countries were conscious of the ill effects of chemical pesticides, viz. pest resurgence, pesticide resistance, soil, water and air contamination, some of which has been documented in the literature in the countries. A large number of persistent toxic pesticides have been banned in Ghana and Nigeria. Although there are two factories manufacturing pesticides in Nigeria, more than 80% of pesticide products are imported into the country. It has been estimated that over 800 million Naira (approximately US$ 5.3 million) is spent yearly on importation of pesticides for agricultural purposes by the government.

The neem tree is believed to have been imported into **Ghana** from India between 1919 and 1927 to combat malaria in the army barracks. The total number of neem trees in Ghana today is estimated at over 6 million. The Forestry Department and the Ministry of Food and Agriculture (MoFA) had promoted neem plantations in their afforestation and agro-forestry programmes and this had led to the establishment of small neem plantations of up to 0.5ha by individuals or by communities as "Community Woodlots". However, the trees are chopped regularly for fuel wood to smoke fish and as rafters. Forest reserves have been established with neem as one of the main trees. ADRA (an NGO) promoted large scale neem plantations under an incentive-based package in the Northern region. Farmers are keen to adopt neem based pesticides in their plant protection schedules. They make their own recipes of neem extract along with other ingredients (in crude form) to combat pests in their fields

The neem tree was first introduced in **Nigeria** in 1928. Several thousand neem seedlings were transplanted in Sokoto, Katsina ad Kano provinces in 1930s. Since then, the desert prone states of Northern Nigeria especially Katsina have been making all efforts to establish neem trees through shelter bed programme to prevent soil erosion and desertification.

Though **Sierra Leone** is not abundant with neem, neem has officially been taken up for plantation under agro-forestry since June 2010. A large number of neem trees are being planted all over the country, and Njala University has done some research on neem. Farmers are aware of the benefits of neem and the ill effects of chemical pesticides. Farmers are keen to adopt neem based pesticides in their plant protection schedules. The networking required in establishing Neem shed exist at the village level and represented by a Paramount Chief who would take the responsibility of seed collection, depulping, drying, storage and production of neem based pesticides.

A.3 Target beneficiaries:

- The main beneficiaries would be ***resource poor farmers***, and ***small-scale village level agri-business enterprises and micro-industries***. Farmers would get access to less expensive and abundantly available pesticides improving their self-reliance, and small-scale village entrepreneurs could avail of the opportunity to use the simple technology to set up micro industries manufacturing the pesticides. They would also be able to access ***niche markets*** for organically grown fruits and vegetables.
- ***Women*** and ***unemployed rural youth*** would be particularly benefited as they would be involved in the ***agri-business*** of seed collection and processing of neem kernel for the manufacture of the neem based pesticides, and this would ***generate employment*** for them.
- ***Technical Institutions*** such as Agricultural Universities would benefit from the technology transfer and institutional linkages, as well as capacity enhancement through participating in the bio-efficacy studies.
- Through reduction in use of polluting chemical fertilizers, health hazards from handling of chemicals, and ***soil, water and food contamination*** would reduce. Thus the community as a whole would be benefited.
- Finally, there would be benefit to the ***environment***, through ***reduction in POPs***.

Gender Aspects:

It is noteworthy that in rural areas it is women who are generally engaged in rudimentary agro-forestry activities such as seed collection. Such activities generally result in rather modest income generation, as they consist of little or no value addition. But with the introduction of the bio-pesticide technology - which is itself a technology that is so simple, that women themselves can engage in it - the simple seed-collection is transformed into an industrial activity with value addition, namely, the production of bio-pesticide. This facilitates women's involvement in the generation of higher income, and contributes to their economic empowerment.

A.4 Strategies and links with developmental projects

Drawing upon the results of the successfully completed UNIDO Project IND/97/958, *"Technical Support for Development and Production of Neem Products as Environment Friendly Pesticides"*, and the recently concluded Phase-II through the Regional Network on Pesticides for Asia and the Pacific (RENPAP) titled *"Production and Promotion of Neem-based pesticides as Environment Friendly Biodegradable Alternatives to Chemical Pesticides"*, it is proposed to transfer the low cost farmer-friendly technology developed and best practices implemented in India to selected countries in West Africa by RENPAP through the south-south cooperation mode, in cooperation with the UCSSIC.

The lessons learnt and the major key results of the India project are as follows:

1. The involvement of the farming community is essential for attaining the ultimate goal of promoting and adopting the single-step low-cost neem-derived pesticide preparation technology.
2. The NKAE technology has been easily adopted by the farming community especially on vegetable and cash crops, which are otherwise under threat of persistent residues of highly hazardous toxic chemicals.
3. High return-cost ratio of the NKAE based bio-pesticides proved the social acceptance of neem-derived pesticide.
4. The neem-sheds developed under the program are fully functional and have become self sustaining for meeting the requirements of the farming community. There has been increased awareness and usage of eco-friendly, biodegradable crop protection agent viz. neem-derived pesticide, and there is a proportional reduction in the use of hazardous chemical pesticide.
5. The project has resulted in the establishment of a coherent networking at the grassroot level to provide all technical backup for promotion and production of neem-derived pesticide.
6. The project has empowered farmers, especially resource poor farmers, to make their own pesticide with less dependence on the costly persistent toxic chemical pesticides.
7. The project has resulted in increased participation of women and rural youth especially in the collection, storage and processing of neem seeds.
8. The target beneficiaries who are resource poor farmers, thereby, the community as a whole are now living in an eco-friendly cleaner environment.

Studies of the NKAE based bio-pesticides available with RENPAP have indicated a high return-cost ratio in neem-derived NKAE in comparison to chemical pesticides. The benefit-cost ratio was high in neem-derived pesticide in comparison to chemical pesticides application in crops, namely egg plant, cabbage, chilli. In egg plant, for example, it is 2.01 (neem-based) vis–a-vis 1.77 (chemical pesticides).

The cost-effectiveness of neem-derived pesticide is manifest in that the initial cost is itself less, since the neem-derived pesticide preparation is a single step involving basically the farming community themselves with no inputs from the market in terms of any chemicals, etc. Raw material which is neem seeds can be collected, dried, stored and processed by the farmers themselves.

B. REASONS FOR UNIDO ASSISTANCE

The UNIDO-supported India-headquartered ***Regional Network on Pesticides for Asia and the Pacific (RENPAP)*** has been promoting the development and use of neem in the Asia Pacific region through its RENPAP network. In India, with the assistance of UNIDO/RENPAP, the first phase of the project entitled "Technical Support for Development and Production of Neem products as Environment Friendly Pesticides" has been successfully completed. The Neem Project Phase II was also formulated and implementation was coordinated by RENPAP acting as a focal point for the project activities of the participating organizations at the field level.

UNIDO has been instrumental in the successful setting up of various projects on pesticides in India including the Neem project Phase I, and the Pesticide Development Programme which involved the establishment of the Pesticide Development Centre (PDC) and the Institute of Pesticide Formulation Technology (IPFT).

RENPAP is ideally suited to act as a conduit to transfer the technologies and expertise utilizing the TCDC concept and play an important role in bringing in improved technologies for the production and use of neem based pesticides.

The ***UNIDO Centre for South-South Industrial Cooperation (UCSSIC)*** is currently involved in successfully implementing a number of projects in African countries, including a Renewable Energy project in Nigeria (and Benin) and a Youth Entrepreneurship project in Sierra Leone (and other Mano River Union countries). It is thus familiar with the West African region, and with mechanisms for the facilitation of technology transfer, institutional linkages and capacity enhancement in the south-south mode.

Thus, the involvement of the RENPAP and the UCSSIC brings the advantages of technology transfer and skill development in the context of south-south cooperation. The good experience, the successful results achieved and the trust and goodwill gained by RENPAP since mid 1980's and the UCSSIC since 2007 provide impetus to the further involvement of UNIDO in the developmental process in the African region.

During the joint UCSSIC-RENPAP Preparatory Mission wide-ranging discussions were held with various government ministries, technical institutions, universities, farmers' federations, civil society organizations, federal, regional and local government departments, and industry associations. The interest and the enthusiasm shown by all stakeholders, as well as the readiness to make commitments to in-kind contributions showed that the project proposal responds to a felt need and is demand –driven.

Overall, the achievements of the project would be manifold: economic, environmental, health-related, agri-business related, and would assist in promoting gender equality, food production, community development, employment generation and grass-root industries.

All this justifies UNIDO intervention and assistance, and involvement of both RENPAP and UCSSIC.

C. THE PROJECT

C.1 Objectives of the project

The project is aimed at promoting the use and development of production capacity of eco-friendly and cost-effective pesticide derived from neem kernels in three countries of West Africa, through neem-shed area development, transfer of appropriate technology, south-south institutional linkages, skill enhancement and training at the village level for rural development, agri-business and micro-industries promotion, poverty alleviation and employment generation, while at the same time strengthening environmental protection and elimination of health hazards by providing a low-cost bio-efficient alternative to toxic POPs and non-biodegradable chemical pesticides and organic food production.

The project also aims at eventually transferring the technology to the agro-industries and pesticide industry in West Africa for commercial ventures, and establishing a regional network on pesticides in West Africa of initially three countries (namely Ghana, Nigeria and Sierra Leone), modelled on and linked to RENPAP.

C.2 UNIDO approach

This project proposal is the result of a joint UCSSIC-RENPAP preparatory mission undertaken during December 2010 to Sierra Leone and Ghana and in April 2011 to Nigeria, after which the country-specific needs of Ghana, Nigeria and Sierra Leone were studied and analysed jointly by PTC/EMB, RENPAP and UCSSIC, with the mission experts paying special attention in designing the project to complement the infrastructure already existing in these countries.

This assessment was based, inter alia, on information gathered during the missions on the crop-wise and pest-wise break-up of pesticide usage in each country, pesticides residues, pesticide poisoning, environmental monitoring, health assessment, current use of pesticides including bio-botanical pesticides other than the chemical pesticides, acceptance of bio-botanical pesticides by the farming community, availability of neem trees (*Azadirachta indica* or other species) in the country, environment and health impact awareness about chemicals pesticides amongst the applicators/farmers, Institutes/Agricultural universities undertaking work on pesticides including bio-botanical pesticides, NGOs/ cooperatives/ Self Help Groups involved in neem seed collection, usage of neem in the country in agriculture and other industries and geographical distribution of neem in the country.

It is after this thorough initial study made by UCSSIC and RENPAP that UNIDO has decided on a *two-pronged approach* to the programme:
(a) Partnering with one identified technical institution in each country (an Agricultural University) to carry out bio-efficacy and phytotoxicity studies and field trials to determine the country-specific and crop-specific dosages for the particular prevailing agro-climatic conditions in the identified neem-shed areas; and
(b) Partnering with a suitable civil society organization (in Ghana, a private entrepreneurial organization, in Nigeria a Polytechnic and NGO, and in Sierra Leone an apex Farmers' Federation) to establish the production and distribution centres in the neem-shed areas and conduct extension and promotion work.

This two-pronged approach will be strengthened through training-of-trainers/key personnel from each country at two identified institutions in India which have considerable experience in the field – one more on the technical side (Neem Foundation, Nagpur) and one more on the extension side (Vivekananda Institute of Biotechnology, Nimpith, West Bengal).

Further, as the project implementation proceeds, the three countries would be networked on the lines of the 17-member network already established in Asia and the Pacific as RENPAP. This would provide the foundation for up-scaling as well as in expansion of the programme to other countries in Africa.

C.3 Project implementation and coordination arrangements

This project will be implemented by the PTC/EMB Project Manager in close collaboration with Director, UCSSIC and RENPAP UNIDO (including UCSSIC and RENPAP) will execute this regional demonstration project in partnership with the relevant agencies of the participating host governments.

The project will build on the Indian experience where public policy has been instrumental in promoting along with strong civil society participation, the acceptance at rural community level the piloting of such technologies at sites within the identified neem-shed areas. A neem-shed area is a defined area consisting of a large group of villages which will be considered the 'catchments area' for spreading public awareness about the importance of neem, and training villagers to engage in the correct method of collection of neem fruits, washing, de-pulping and drying them to obtain the seeds, then either supplying them to a collection centre for mechanised decorticating, storage and processing of the kernel into pesticide through NKAE, or to decorticate the seeds themselves and process the kernel to extract the pesticide themselves. The farmers will also be trained in the proper application of pesticide to various crops in the correct dosages.

Based on extensive consultation with NGOs with experience in this field, it is expected that bio-pesticides technologies will most easily win broad acceptance within civil society if, at a minimum, they can demonstrate two important characteristics:

- They operate in systems that are essentially very robust and appropriate technologies easily adjustable in rural settings.
- They can achieve comparable protective efficiency to chemical pesticides in controlling a wide range of pest-plant situations.

Full civil society involvement in all project elements will characterize the work of the project at both regional and country levels. This is considered to be a unique project characteristic that is crucial to project success. It will be consistently emphasized and documented.

Project stakeholders will also include representatives of the private sector and relevant government-owned enterprises as well as representatives of relevant sectors of scientific and academic communities. At the regional level, stakeholder groups will be involved in the development of assessment criteria and guidelines to be used at the country level to provide guidance implementation planning; and in monitoring and oversight activities associated with technology performance and with environmental health and safety issues. Stakeholder groups will also be involved at the regional level in the production and dissemination of project information, reports evaluations, and other barrier reduction activities. Special efforts will be made to involve participation from community-based and popular organizations in or near the locale where the demonstration activities will be taking place.

The following Indian institutions which were established with the support and guidance of RENPAP during past years, and are now centres of excellence, have been identified to be involved in the training of trainers and key personnel from each of the beneficiary countries to expose them to the technology, field experience and best practices in India, which they would then be expected to replicate in their own countries with appropriate modifications:

- *Neem Foundation, Nagpur, Maharashtra State, India*
- *Vivekananda Institute of Bio-technology, Nimpith, West Bengal State, India*

The nodal Ministry in each country will be requested to establish a ***National Neem Coordination Cell*** which will consist of senior officials of all concerned Ministries and Departments (Agriculture, Industries, Health and Environment). *(See Annex 3 for details).*

A ***National Coordinator*** will be identified and appointed as an expert consultant under the project for coordinating the project in the field under the guidance of RENPAP, UCSSIC and the relevant URO, and also for liaising with the National Neem Coordination Cell, government departments, National Technical Partners, Neem Centre management and civil society stakeholders. *(See Annex 2 for details).*

In each beneficiary country one technical institution (an Agricultural University) has been identified as a ***National Technical Partner*** to carry out bio-efficacy and phytotoxicity studies and field trials to determine the country-specific and crop-specific dosages for the particular prevailing agro-climatic conditions in the identified neem-shed areas. *(See Annex 4 for details).*

Also a suitable civil society organization (in Ghana, a private entrepreneurial organization, in Nigeria a Polytechnic and NGO, and in Sierra Leone an apex Farmers' Federation) will be selected in which to locate the ***Neem Centre*** to establish the mechanised production and distribution of pesticides and conduct extension and promotion work in the neem-shed areas. *(See Annexes 5 and 6 for details).*

The country-wise identified institutions and their responsibilities are summarised as follows:

Ghana

- ***Ghana University Institute of Agricultural Research, Accra***
  To undertake, scientific field trials, phyto-toxicity studies, bio-efficacy data generation, and technical guidance to the managers and workers at the Neem Centre established in TRAGRIMACS, training of trainers, extension officers and workers.
- ***Tropical Agricultural Marketing & Consultancy Services (TRAGRIMACS) – A PPP model***
  To establish and manage the Neem Centre for the Ghana neem-shed area, with prototype/ pilot machinery for the processing/production of neem based pesticide, undertake seed collection, de-pulping, drying, storage, production and application of neem based pesticides (NKAE), training of trainers, seed collectors, farmers, village women, extension officers and workers; field demonstrations in selected crops in the neem-shed, and commercial production of neem based pesticides

Nigeria

- ***Ahmadu Bello University, Zaria, Kaduna State***
  To undertake, scientific field trials, phyto-toxicity studies, bio-efficacy data generation, and technical guidance to the managers and workers at the Neem Centre established in the Katsina Polytechnic, training of trainers, extension officers and workers.
- ***College of Agriculture, Hassan Usman Polytechnic, Katsina State***
  To establish and manage the Katsina Neem Centre for the Katsina neem-shed area, with prototype/ pilot machinery for the processing/production of neem based pesticide, undertake seed collection, de-pulping, drying, storage, production and application of neem based pesticides (NKAE), training of trainers, seed collectors, farmers, village women, extension officers and workers; field demonstrations in selected crops in Katsina neem-shed.
- ***Neem Link, Non-Governmental Organization, Katsina***
  Neem Link will work closely with the Katsina Polytechnic for the implementation of the project activities, production of the neem based pesticides and the extension and awareness raising among the farming community in the State, including neem plantation where necessary.

Sierra Leone

- ***Njala University, Moyamba district***
  To undertake, scientific field trials, phyto-toxicity studies, bio-efficacy data generation, and technical guidance to the managers and workers at the Neem Centre established in Waterloo, training of trainers, extension officers and workers.
- ***National Federation of Farmers, Waterloo***
  To establish and manage the Neem Centre for the Sierra Leone neem-shed area, with prototype/ pilot machinery for the processing/production of neem based pesticide, undertake seed collection, de-pulping, drying, storage, production and application of neem based pesticides (NKAE), training of trainers, seed collectors, farmers, village women, extension officers and workers; field demonstrations in selected crops in the neem-shed area, in Southern, Eastern and Western region districts and in and around Freetown

Modality of Sub-Contracting

UNIDO would enter into sub-contract with each of the participating institutions, viz. (a) Ghana University Institute of Agricultural Research, Accra; (b) Tropical Agricultural Marketing & Consultancy Services (TRAGRIMACS), Accra; (c) Ahmadu Bello University, Zaria, Kaduna State; (d) College of Agriculture, Hassan Usman Polytechnic, Katsina State; (e) Neem Link, Non-Governmental Organization, Katsina, (f) Njala University, Moyamba district, Sierra Leone; (g) National Federation of Farmers, Waterloo, Sierra Leone. The detailed job description in each sub-contract will be drawn up by RENPAP, clearly delineating the specific technical responsibilities, the periodic deliverables and the time-frame. These activities would collectively be intended to establish various aspects of the neem sheds and execute specific activities of the project under the overall technical guidance and coordination of RENPAP.

The sub-contracts would, *inter alia*, cover the following major operational activities:

- Establishment of Neemsheds at Accra, Zaria, and Njala, with the Academic Institutions spearheading the bioefficacy studies, and then conducting the field trials with the cooperation of the NGOs. These sheds would become Demonstration Centres of Learning for the farmers and provide technical back up and extension guidance for promoting agro-based products for sustainable eco-friendly agriculture.

- Specifically the Academic Institutions would take the lead in:

(i)Adoption of NKAE technology perfected under the project in the Integrated Pest Management Programme (IPM).
(ii)Bioevaluation of Aqueous Neem Kernel Extract (NKAE) technology on wide range of crops covering major economically important pests.

- Specifically the NGOs would take the lead in:
  (i) Organization of Cooperatives of neem seed collection and distribution at village level and Block level.
  (ii) Organising collection of neem kernels and processing through setting up of small plants near the neem seed collection centres.

- The Neemsheds established at various locations as mentioned earlier, would standardize and adopt the single-step established technology for economical production of neem kernel derived pesticides.

- Training programmes would be organized to demonstrate the performance of such technology using simple machines. Demonstration of NKAE technology on a variety of indigenous crops, and Farmers field demonstration on different crops for wider coverage and acceptance of neem based pesticides by the farming community.

Financial/Economic Sustainability of the Neem Centres:
Sustainability of the Centres will be achieved at the end of the project. The Centres would be involved in the neem fruit collection, de-pulping, drying, storage, processing and pesticide production from neem kernels. All these steps are linked with income generation through a value-added chain. Rural women and unemployed youth will be encouraged to organize themselves into groups to undertake these activities.

The equipment to be installed in the Neem Centres is not sophisticated or complex, nor would it require large investment or overheads to maintain. The Centres are deliberately chosen to be located in well established Academic Institutions (Agricultural Colleges), where back-up technical services are available. The sustainability would arise from the involvement of the Non-Governmental Organizations - three different models in each of the countries: in Sierra Leone, the apex Farmers' Federation, in Ghana a private entrepreneur, and in Nigeria a civil society organization. This variety will also provide valuable experience and indication on the preferable mode to be followed in future up-scaling.

The concept of establishing groups or associations or cooperatives (as the field situation in each country dictates during the process of implementation) will be adopted at the village-level for (a) *Neem* seed collection (b) preparation of finished products (c) marketing and sale (d) education and training. This would facilitate the task of providing readymade *Neem* kernel powder to farmers for preparation of the low-cost *Neem* Kernel Aqueous Extract (NKAE). Associations/Cooperatives can also generate rural employment and help to popularize *Neem* pesticides amongst the farming community. This strategy can be fruitfully linked with entrepreneurship development programmes in rural areas. While the initial support for such an initiative may come from Government sources/project funds, the activities of the Centres would ultimately become self-sustaining.

Additionally, the sustainability of the project rests with the successful removal of the identified barriers towards large scale and wide production and use of neem-derived bio-pesticides in rural communities resulting in substantial increase in its application as a substitute to conventional chemical pesticides.

Beyond the project demonstration period, the perfected simple technology involving the neem fruit collection, de-pulping, drying, storage, processing and bio-pesticide production from neem kernels, would be transferred to the interested cooperatives, small scale cottage industry, entrepreneurs, NGOs and academic R&D partner institutions.

In the Neem Centres, an industrial level production facility would be set up through indigenous fabrication of the commercial scale machines for depupling, drying and processing of the neem seed kernel for large scale production of the neem based pesticides. The refinement in the fabrication and commercialization would be modeled on the Indian experience where small and large scale machinery have been designed, tested and become operational for commercial scale usage. These facilities would be transferred to the relevant departments of the agricultural universities dealing with extension work, to supplement and strengthen their on-going work in agricultural technology extension and dissemination. They would thus serve a dual purpose - that of demonstration, as well as augmenting the broader agricultural extension work.

Civil society groups will be given full and equal opportunity to participate in important decision making including technology transfer and will also be given a role in the design and up-scaling of the production facilities for neem based pesticides.

Involvement of the local NGOs viz. Farmers' Federation in Sierra Leone, private entrepreneur in Ghana and civil society organization in Nigeria would establish models of sustainability for commercialization of neem based pesticides in different contexts. Thus up-scaling and dissemination can follow all or any one of the models: cooperative, private entrepreneur, NGO - as found more effective.

C.4 RBM code and thematic area code

RBM Code: Stockholm Convention: DE14 - Thematic area code: EAE

C.5 Expected Outcomes

The expected outcomes are:

- Farmers will be empowered through technology-dissemination, training and skill development to produce their own low-cost organic neem-derived bio-pesticides;
- Agri-business activities and micro-industries for pesticide production at the village level will be promoted thus generating employment, particularly for women and youth;
- Technical capacity of Agricultural Universities will be enhanced through technology transfer and participation in phyto-toxicity and bio-efficacy studies;
- Environmental protection would be enhanced through reduction in use of non-biodegradable pesticides and POPs;
- Agricultural production would be enhanced and niche markets for organically grown fruits and vegetables could be accessed.

A broader, long term expected outcome of the project will be that commercial production of neem-derived pesticides will be taken up on a larger scale, and that a Regional Network of countries in Africa will be established based on the RENPAP model.

C.6 Outputs and Activities

Output 1: National coordination arrangements in place, training provided to key personnel involved in field implementation, and potential stakeholders sensitised and individual work-plans finalised through Inception Workshops	
Activities	***Responsibility***
(a) Appointment of a National Coordinator in each country	UNIDO, on advice of relevant URO
(b) Establishment of a National Neem Coordinating Cell in each country	Concerned nodal Ministry in each country and relevant URO
(c) Trainings organised at Neem Sheds / Technical Institutions in India for 9 key personnel (3 from each participating country)	RENPAP / UCSSIC
(d) Organization of an Inception Workshop in each country to sensitize stakeholders, to discuss the project plan at micro level, and to finalize the detailed work-plans and responsibilities of each of the participating organizations/ institutions.	National Coordinators, under guidance of relevant URO and RENPAP
(e) Conduct neem survey and estimated census to assess neem seed potential of the neem-shed area and pinpoint focus locations for future up-scaling	National Coordinators
Output 2: Technology transferred to three National Technical Partners (Agricultural Universities), and field trials, phyto-toxicity studies and crop-specific bio-efficacy data	

generated	
Activities	***Responsibility***
(a) The low cost production technology for neem based pesticides would be transferred to the National Technical Partners (participating Agricultural Universities)	RENPAP
(b) Bio-evaluation of Neem Kernel Aqueous Extract (NKAE) technology through scientific field trials under varied agro-climatic conditions in each participating country	National Technical Partners (participating Agricultural Universities)
(c) Generation of bio-efficacy and phyto-toxicity data on different crops for three seasons at different locations to prove the effectiveness of the neem based pesticides (Neem Kernel Aqueous Extract, NKAE) against the economically important pests on different crops	National Technical Partners (participating Agricultural Universities)
(d) Demonstration of the NKAE on different crops in the farmers fields	National Technical Partners (participating Agricultural Universities) and Neem Centre managements
<u>Output 3</u>: Three Neem Centres with mechanised pesticide production demonstration plant along with storage facility established in Neem-Shed Areas	
Activities	***Responsibility***
(a) Setting up of mechanised demonstration plants (depulper, decorticators, crushers, storage facilities) for production of neem-derived pesticides.	National Coordinators and Neem Centre managements, under guidance of RENPAP
<u>Output 4</u>: Dissemination of standardised technology through extension work and training of villagers and micro-entrepreneurs for proper seed collection and neem-derived bio-pesticide production	
Activities	***Responsibility***
(a) Provide necessary equipment/training material to Neem Centres for training the farmers and promoting neem based pesticides.	RENPAP, National Coordinators
(b) Multiply field demonstrations, awareness camps and guidance to farmers	Neem Centre management, National Coordinator
<u>Output 5</u>: Pesticide production technology show-cased for replication and scaling up, and Regional Network of countries established based on RENPAP model	
Activities	***Responsibility***
(a) A National workshop will be organised in each country to showcase the technology and project results, to disseminate it policy makers, industry, international donors and civil society organizations	RENPAP, UCSSIC and relevant UROs
(b) Standardised production technology would be made available to industry for commercial exploitation of the neem based technology to produce packaged neem-kernel powder with longer shelf life.	Concerned Ministries and National Technical Partners
(c) A Regional Network of participating countries will be	UNIDO, RENPAP

established, based on RENPAP networking model, for promoting use of neem based pesticides, a safe, eco-friendly bio-degradable product, as alternative to chemical pesticides.	

C.7 ACTVITIES TIMELINE

Output/Activity	Year	1				2				3			
	Quarter	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
***Output 1*: National coordination arrangements in place, training provided to key personnel involved in field implementation, and potential stakeholders sensitised and individual work-plans finalised through Inception Workshops**													
Activities													
(a) Appointment of a National Coordinator in each country													
(b) Establishment of a National Neem Coordinating Cell in each country													
(c) Trainings organised at Neem Sheds / Technical Institutions in India for 9 key personnel (3 from each participating country)													
(d) Organization of an Inception Workshop in each country to sensitize stakeholders, to discuss the project plan at micro level, and to finalize the detailed work-plans and responsibilities of each of the participating organizations/ institutions.													
(e) Conduct neem survey and estimated census to assess neem seed potential of the neem-shed area and pinpoint focus locations for future up-scaling													
***Output 2*: Technology transferred to three National Technical Partners (Agricultural Universities), and field trials, phyto-toxicity studies and crop-specific bio-efficacy data generated**													
Activities													
(a) The low cost production technology for neem based pesticides would be transferred to the National Technical Partners (participating Agricultural Universities)													
(b) Bio-evaluation of Neem Kernel Aqueous Extract (NKAE) technology through scientific field trials under varied agro-climatic conditions in each participating country													

Year	1				2				3			
Output/Activity / **Quarter**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**
(c) Generation of bio-efficacy and phyto-toxicity data on different crops for three seasons at different locations to prove the effectiveness of the neem based pesticides (Neem Kernel Aqueous Extract, NKAE) against the economically important pests on different crops												
(d) Demonstration of the NKAE on different crops in the farmers fields												
Output 3: Three Neem Centres with mechanised pesticide production demonstration plant along with storage facility established in Neem-Shed Areas												
Activities												
(a) Setting up of mechanised demonstration plants (depulper, decorticators, crushers, storage facilities) for production of neem-derived pesticides.												
Output 4: Dissemination of standardised technology through extension work and training of villagers and micro-entrepreneurs for proper seed collection and neem-derived bio-pesticide production												
Activities												
(a) Provide necessary equipment/training material to Neem Centres for training the farmers and promoting neem based pesticides.												
(b) Multiply field demonstrations, awareness camps and guidance to farmers												
Output 5: Pesticide production technology show-cased for replication and scaling up, and Regional Network of countries established based on RENPAP model												
Activities												

Output/Activity / Year	1				2				3			
Quarter	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
(a) A National workshop will be organised in each country to showcase the technology and project results, to disseminate it policy makers, industry, international donors and civil society organizations												
(b) Standardised production technology would be made available to industry for commercial exploitation of the neem based technology to produce packaged neem-kernel powder with longer shelf life.												
(c) A Regional Network of participating countries will be established, based on RENPAP networking model, for promoting use of neem based pesticides, a safe, eco-friendly bio-degradable product, as alternative to chemical pesticides.												

C.8 Risks

• Governments unable to provide in kind contributions	**Low**
• Federal and State organizations unable to coordinate the project	**Low**
• National Technical Partner Institutions (agricultural Universities) unable to undertake proper bio-efficacy studies and crop-specific field demonstrations	**Low**
• Neem Centre managements unable to undertake adequate extension work	**Low**

D. INPUTS

D.1 Counterpart inputs

The Government of Nigeria, Ghana and Sierra Leon along with the participating organizations/NGOs would provide counterpart contributions in kind/cash in the form of land, laboratories, fixtures, maintenance of Neem Sheds, staff, etc. to this project and directly by providing to the cooperatives equipment as well as building/infrastructure for establishing Neem Sheds to an estimated value of US$ 225,000.The participating institutions would provide staff to carry out the project activities like generation of bio-efficacy data, training programmes, running of Neem Centres in neem-shed areas, etc.

D.2 UNIDO inputs

UNIDO will be responsible for the following inputs:

(a) International staff
Recruitment of all the international and/or national experts and consultants required for the project, including RENPAP experts.

(b) National staff
A National Coordinator, who would be recruited on a part-time basis, with demonstrable skills and experience would coordinate the work as per TOR in the respective participating country.

(c) Sub-contracts
UNIDO would enter into agreements with the participating institutions which would establish and manage the Neem Centres and implement the specified activities. UNIDO will also enter into agreements/MoUs with the participating Agricultural Universities to act as National Technical Partners, and implement the specified activities (Please also see 'Modality of Sub-contracting' in Section C.3)

(d) Training
Training of 9 stakeholders from participating countries (3 each from each country) at two institutions in India which have rich technical and extension-work experience in the field, viz. Vivekananda Institute of Bio-technology, at Nimpith in West Bengal State, and Neem Foundation, at Nagpur in Maharashtra State. The purpose of the Study Tour would be to learn the production technology of neem-derived bio-pesticides and to understand the concept of neem-shed area development and its operation, including tested models of technology extension in rural settings.

Training for trainers would also be organized locally by RENPAP experts with in-kind participation of governments. Neem Centre institutions along with trainers would organize a number of training programmes for the benefit of NGOs, SHG, farming community, village women, extension officers, industry, etc.

(e) Equipment and supplies
Procurement/fabrication of machinery required for the production of neem based pesticides based on the designs from India would be done locally and commissioned in Neem Centres.

E. BUDGET
(From UCSSIC funds)

BL	Description	US$
13-00	Administrative/ secretarial support	2,000
15-00	Project Travel (RENPAP, UCSSIC & Experts/ Consultants)	30,000
16-00	UNIDO staff travel	10,000
17-00	National consultants	27,000
21-00	Sub-contracts (for establishment of 3 Neem-pesticide production centres, and field studies and trials by 3 Technical Institutions - one each in Ghana, Nigeria & Sierra Leone)	150,000
32.00	Study tours for 9 experts from Nigeria, Ghana and Sierra Leone	32,000
35-00	Workshops/meetings	18,000
51-00	Miscellaneous	6,000
99-99	Total	275,000
	13% Support Cost	35,750
	G. Total	310,750

We have discussed with RENPAP, and we feel that the funds are sufficient for the awareness as well as the establishment of the pilot Neem Centres

F. MONITORING, REPORTING AND EVALUATION

Quarterly activities reports will be submitted by the participating organizations and the National Consultants. The UNIDO Project Manager from PTC/EMB will manage the implementation of the project in close collaboration with RENPAP and Director, UCSSIC, and the UROs in each of the beneficiary countries. The implementation team will be responsible for reviewing and updating work plans and implementing the project in accordance with UNIDO rules and procedures. Bearing in mind that the cash component of the project is $275,000, there will be a self-evaluation done at the end of the project by the Project Manager, in collaboration with RENPAP and UCSSIC.

G. PRIOR OBLIGATIONS AND PREREQUISITES

H. LEGAL CONTEXT

It is expected that each set of activities to be implemented in the target countries will be governed by the provisions of the Standard Basic Cooperation Agreement concluded between the Government of the recipient country concerned and UNIDO or – in the absence of such an agreement – by one of the following: (i) the Standard Basic Assistance Agreement concluded between the recipient country and UNDP, (ii) the Technical Assistance Agreements concluded between the recipient country and the United Nations and specialized agencies, or (iii) the Basic Terms and Conditions Governing UNIDO Projects.

Annex 1: Logical Framework

PROJECT GOAL

Empowering farmers and promoting agri-business activities and micro-industries to produce low-cost organic neem-derived bio-pesticides, and simultaneously enhancing environmental protection through reduction in use of POPs.

A broader goal is to establish a Regional Network of countries in West Africa based on the RENPAP model, which will continue to promote up-scaling and dissemination of such activities in Africa.

Interventions	Objectively Verifiable Indicators	Means of Verification	Assumptions/Risks
Outcome 1: Establishment of national coordination units and training of personnel			
Output 1: National coordination arrangements in place, training provided to key personnel involved in field implementation, and potential stakeholders sensitised and individual work-plans finalised through Inception Workshops	➢ National coordination unit is operational ➢ National neem coordinating cell established ➢ One Training organised in India for nominees from the participating countries	➢ Training reports ➢ Survey/census activity reports	Delays in identification/selection process of national coordinator
Activity 1: Appointment of a National Coordinator in each country **Activity 1.1:** Establishment of a national neem coordinating cell in each country **Activity 1.2:** Trainings organised at neem sheds / Technical Institutions in India for 9 key personnel (3 from each participating country) **Activity 1.3:** Organization of an Inception Workshop in each country to sensitize stakeholders, to discuss the project plan at micro level, and to finalize the detailed work-plans and responsibilities of each of the participating organizations/ institutions. **Activity 1.4:** Conduct neem survey and estimated census to assess neem seed potential of the neem-shed area and pinpoint focus locations for future up-scaling	➢ TOR prepared and National coordinator selected and appointed ➢ National neem coordinating cell established ➢ Training organised in India for nominees from the participating countries ➢ Inception workshop organized and detailed work-plan finalized ➢ Neem survey in the neem shed area conducted and census completed.	➢ Progress report ➢ Training reports	

Outcome 2: Transfer of technology to project counterparts and phyto-toxicity studies undertaken			
Interventions	**Objectively Verifiable Indicators**	**Means of Verification**	**Assumptions/Risks**
Output 2: Field trials, phyto-toxicity studies and crop-specific bio-efficacy data generated	➢ Production technology for neem based pesticides transferred and operational ➢ A minimum of one scientific field trial on different crops conducted Crop-specific bio-efficacy data generated	➢ Activity report ➢ Data report on the field trial submitted	Low level of participation and support of farmers and availability of farmers field for implementing the trials
Output 2.1: The low cost production technology for Neem based pesticides transferred to the National Technical Partners (participating Agricultural Universities)	One or two demonstration trials carried out by the technical partners	Data report on demonstration trials submitted	
Output 2.2: Bio-evaluation of Neem Kernel Aqueous Extract (NKAE) technology performed under varied agro-climatic conditions in each participating country	➢ Scientific field trials started ➢ Neem extracts produced	Periodic reports submitted by Agricultural Universities/Polytechnic to RENPAP	
Output 2.3: Generation of bio-efficacy and phyto-toxicity data on different crops for three seasons at different locations to prove the effectiveness of the Neem based pesticides (Neem Kernel Aqueous Extract, NKAE) undertaken	➢ Data and analysis performed ➢ Findings reported in two locations	Periodic reports submitted by Agricultural Universities/Polytechnic to RENPAP	
Activity 2: The low cost production technology for neem based pesticides would be transferred to the National Technical Partners (participating Agricultural Universities) **Activity 2.1:** Bio-evaluation of Neem Kernel Aqueous Extract (NKAE) technology through scientific field trials under varied agro-climatic conditions in each participating country **Activity 2.2:** Generation of bio-efficacy and phyto-toxicity data on different crops for three seasons at different locations to prove the effectiveness of the neem based pesticides (Neem Kernel Aqueous Extract, NKAE) against the economically important pests on different crops	➢ Number of scientific field trial on different crops conducted ➢ Number of demonstration trials carried out.	Data report on demonstration trials	Low level of participation and support of farmers and availability of farmers field for implementing the trials

Activity 2.3: Demonstration of the NKAE on different crops in the farmers fields			
Interventions	**Objectively Verifiable Indicators**	**Means of Verification**	**Assumptions/Risks**
Outcome 3: Establishment of Neem centres and sheds in the three countries completed			
Output 3: Three Neem Centres with mechanised pesticide production demonstration plant along with storage facility established in Neem-Shed Areas	➢ Demonstration plants set up in ten Neem Sheds ➢ Neem seed collection centres established in the three countries ➢ At least one setting up of mechanised demonstration plants (depulper, decorticators, crushers, storage facilities) for production of Neem-derived pesticides established	Physical existence of shed and equipment at site	Not sufficient support coming north from SHG/rural community
Activity 3: Setting up of mechanised demonstration plants (depulper, decorticators, crushers, storage facilities) for production of neem-derived pesticides.	Rural community SHG mobilized	Activity reports submitted	Not sufficient support coming forth from SHG/rural community
Outcome 4: Standards set for bio-pesticides production and application			
Output 4: Dissemination of standardized technology through extension work and training of villagers and micro-entrepreneurs for proper seed collection and neem-derived bio-pesticide production	One hundred copies of booklets produced and distributed	Booklets distributed	Low level of participation and support of farmers and availability of farmers field for the implementing the trials.
Output 4.1: Provide necessary equipment/training material to Neem Centres for training the farmers and promoting neem based pesticides	At least one or two demonstration trials carried out.	Data report on demonstration trials	
Activity 4: Provide necessary equipment/training material to Neem Centres for training the farmers and promoting neem based pesticides. **Activity 4.1.** Multiply field demonstrations, awareness camps and guidance to farmers	➢ Training material available and training programmes organized ➢ Number of demonstration trials carried out	➢ Training and activity reports submitted ➢ Data report on demonstration trials	Low level of participation and support of farmers and availability of farmers field for the implementing the trials.

Outcome 5: RENPAP model of bio-pesticides introduced. Commercial exploitation of Neem based technology to produce packaged Neem-kernel powder with longer shelf life documented			
Output 5: Pesticide production technology show-cased for replication and scaling up, and Regional Network of countries established based on RENPAP model	➢ Partners and stakeholders identified and committed to the plan for introduction of the RENPAP model ➢ Two national workshops conducted. ➢ Regional network of participating countries established	➢ At least three workshops on awareness raised ➢ Workshop report presented	Stakeholders groups formed at different levels
Output 5.1: A National workshop organised in each country to showcase the technology and project results, to disseminate it policy makers, industry, international donors and civil society organizations	➢ One model of technology transferred to the rural agro-industries and other SMEs for commercialization ➢ A regional network established in Africa	Activity reports	
Activity 5: A National workshop will be organised in each country to showcase the technology and project results, to disseminate it policy makers, industry, international donors and civil society organizations **Activity 5.1:** Standardised production technology would be made available to industry for commercial exploitation of the neem based technology to produce packaged neem-kernel powder with longer shelf life. **Activity 5.2:** A Regional Network of participating countries will be established, based on RENPAP networking model, for promoting use of neem based pesticides, a safe, eco-friendly bio-degradable product, as alternative to chemical pesticides	➢ National workshop conducted	Workshop activity reports	Poor response from industry

Annex 2: **Terms of Reference for National Coordinator**
(Three, one in each beneficiary country viz. Ghana, Nigeria and Sierra Leone)

Post Title:	National Coordinator
Duration:	Total 150 days over three years (75 days in first year, 30 days in second year, 45 days in third year)
Date required:	During three years of project implementation
Duty station:	Home country
Counterpart:	Respective Governments, UNIDO Project Managers (Chief PTC/EMB & Director, UCSSIC), UNIDO Field/Regional Offices

Duties:
Under the overall supervision of the Chief, PTC/EMB, and in coordination with Director, UCSSIC (India), RENPAP and UNIDO Representative in each country:

- Facilitating the implementation of the project activities
- To liaison with the relevant stakeholders, including National Neem Coordination Cell, Government Departments, National Technical Partners (Agricultural University identified under the project), Neem Centre management and civil society organizations.
- Monitoring the conduct of field trials and demonstration trails on different crops by the National Technical Partner and the Neem Centre management
- Organising training programmes
- Facilitating the establishment of Neem Centre (neem shed sites in the neem command area)
- Guiding the Neem Centre management in its activities, including neem seed collection, processing, storing and production of neem based pesticides
- Visiting existing neem plantations and discussions with farmers and NGOs
- Examination of possibilities of introducing new/improved cultivars.
- Providing local liaison during visits of International Expert and connected UNIDO missions.

Qualifications: A post-graduate degree in Agriculture or Entomology or Chemistry or Forestry, with adequate experience in the area of plant protection and pesticides. He/she must have a thorough knowledge of the national agricultural extension network, national plant protection need and the community based developmental work, and ability and willingness to communicate, liaise and coordinate.
1)
Language: **English**

Annex 3: Role of National Neem Coordination Cell

The National Neem Coordination Cell (NNCC) would be established in the nodal ministry in each country, and include representatives of all relevant Ministries, Directorates and Government Agencies (including Agriculture, Industry, Health and Environment). The nominee of the nodal Ministry will be the ex-officio Convenor of the NNCC, who will arrange for convening its meetings and chairing them.

The UNIDO Representative (or an officer designated by the UR) will be a Special Invitee to the NNCC. The National Coordinator will also be a permanent invitee to the NNCC meetings.

The main responsibility of the NNCC will be to facilitate the project implementation by coordinating the roles of the various government agencies.

The NNCC will periodically review the project implementation and offer policy guidance so as to ensure that the project is in line with national priorities

The National Coordinator will provide periodic reports to the NNCC, and will also be present at its meetings

Annex 4: Responsibilities of Technical Partner Institutions (Agricultural Universities)

Under the guidance of RENPAP, the participating technical partner institution would be responsible for:

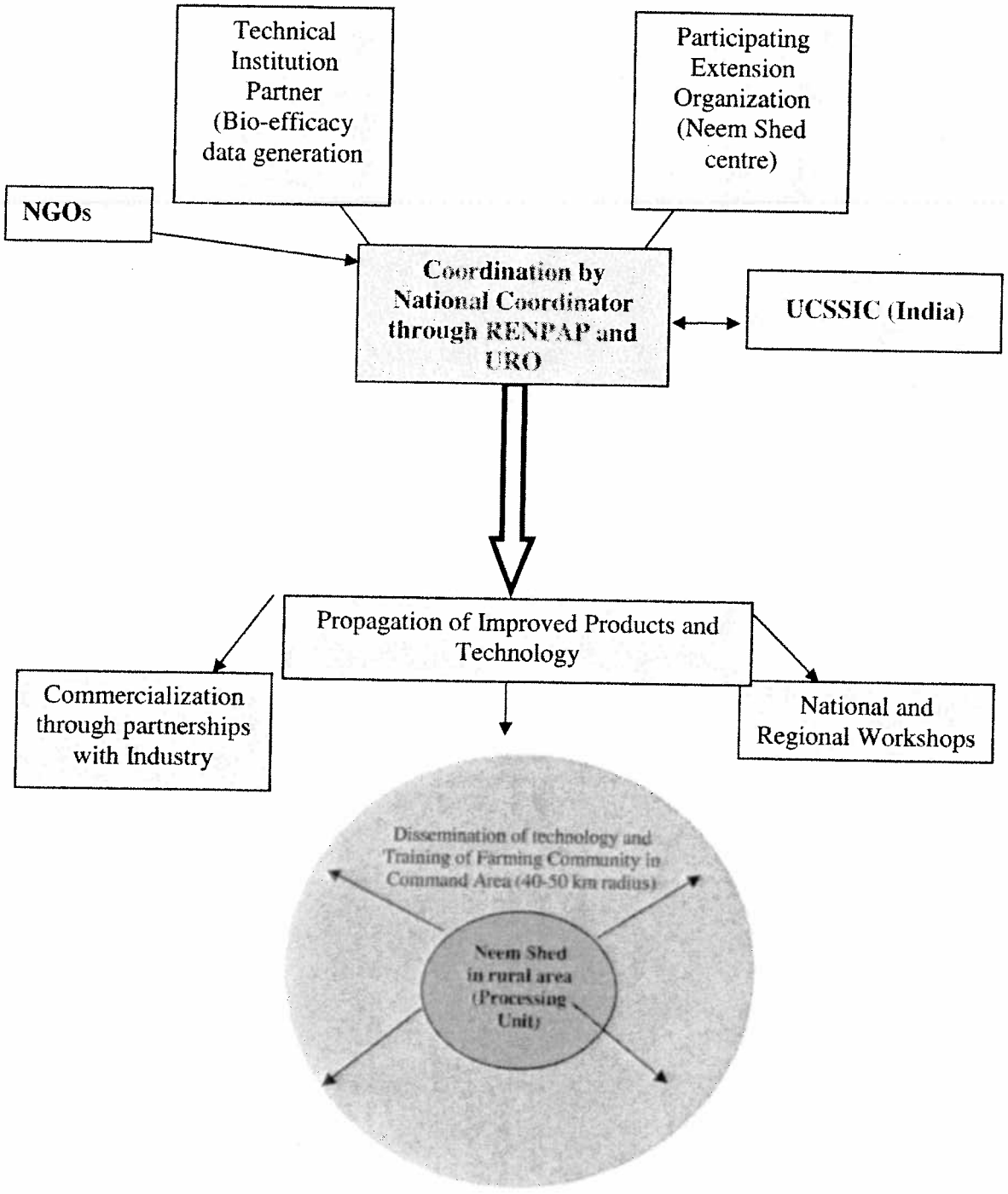
- undertaking scientific field trials,
- phyto-toxicity studies,
- bio-efficacy data generation, and
- technical guidance to the managers and workers at the Neem Centre,
- training of trainers, extension officers and workers.

The National Coordinator will liaise with the Technical Partner Institution.

Annex 5: Organizational Chart of Neem Centre

The Neem Centre will be established in neem-shed command area. It will

- be equipped with prototype/ pilot machinery for the processing/production of neem based pesticide,
- undertake seed collection, de-pulping, drying, storage, production and application of neem based pesticides (NKAE),
- training of trainers, seed collectors, farmers, village women, extension officers and workers;
- field demonstrations in selected crops in the neem-shed command area



Annex 6: Equipment proposed to be installed in Neem Centres

Each of the Neem Centre in participating countries will be equipped with the following:

1. Depulper
2. Dryers
3. Decorticator,
4. Pulverisers
5. Spraying application machines
6. Small equipment such as nets, basket, buckets, etc. for fruit/seed collection

Annex 7: Estimates for In-kind Contribution

A. RENPAP: US$75,000 (In-kind)

1.	Consultancy	:	US$ 30,000
2.	Organising training in India	:	US$ 20,000
3.	Transfer of Technology	:	US$ 25,000

B. Participating countries (Nigeria, Ghana, Sierra Leone) US$75,000each (in-kind)

1.	Cost of land	:	US$ 25,000
2.	Manpower	:	US$ 30,000
3.	Cost of demonstration trials	:	US$ 15,000
4.	Training programmes	:	US$ 5,000

Brief description:

The programme is aimed at promoting the use of and development of production capacity of eco-friendly and cost-effective pesticide derived from neem kernels in three countries of West Africa – Ghana, Nigeria and Sierra Leone.

This would be achieved through neem-shed area development, transfer of appropriate technology, south-south institutional linkages, skill enhacement and training at the village level for rural development, agri-business and micro-industries promotion, poverty alleviation and employment generation, while at the same time strengthening environmental protection and elimination of health hazards by providing a low-cost bio-efficient alternative to toxic POPs and non-biodegradable chemical pesticides, and supporting organic food production.

In this pilot phase, one neem-shed area in each country will be developed, and Neem Centres established to function as a demonstration, production and promotion centre of neem kernel derived bio-pesticides based on aqueous extraction (NKAE) technology, which has been perfected in India and now popularized in the network of 17 countries of Asia and the Pacific, which are members of RENPAP. This would be backed up by an academic R&D institution in each country that will be strengthened to carry out bio-efficacy and phyto-toxicity studies to determine country-specific agro-climatic specific dosages and other necessary scientific data.

Eventually, the mechanized production technology could be transferred to the agro-industries / pesticide industry in West Africa for production of packaged neem-kernel powder with long shelf-life through commercial ventures. The project also aims at eventually establishing a regional network no pesticides in West Africa of initially three countries namely Ghana, Nigeria and Sierra Leone modeled on and linked to RENPAP.

Approved	**Signature:**	**Date:**	**Name and Title:**
On behalf of *The Government of:* **Ghana**		15/05/14	MAURICE TANCO ABISA-SEID CHIEF DIRECTOR MINISTRY OF FOOD & AGRICULTURE
Nigeria			
Sierra Leone			
On behalf of UNIDO:		4/5/2014	Akmel Prosper Akpa UNIDO AMC Chairman

Brief description:

The programme is aimed at promoting the use of and development of production capacity of eco-friendly and cost-effective pesticide derived from neem kernels in three countries of West Africa – Ghana, Nigeria and Sierra Leone.

This would be achieved through neem-shed area development, transfer of appropriate technology, south-south institutional linkages, skill enhacement and training at the village level for rural development, agri-business and micro-industries promotion, poverty alleviation and employment generation, while at the same time strengthening environmental protection and elimination of health hazards by providing a low-cost bio-efficient alternative to toxic POPs and non-biodegradable chemical pesticides, and supporting organic food production.

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Approved	**Signature:**	**Date:**	**Name and Title:**
On behalf of *The Government of:*			
Ghana			
Nigeria		05-03-15	LAURENTIA MALLAM HON MINISTER
Sierra Leone			
On behalf of UNIDO:			Akmel Prosper Akpa UNIDO AMC Chairman

Brief description:

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Eventually, the mechanized production technology could be transferred to the agro-industries / pesticide industry in West Africa for production of packaged neem-kernel powder with long shelf-life through commercial ventures. The project also aims at eventually establishing a regional network no pesticides in West Africa of initially three countries namely Ghana, Nigeria and Sierra Leone modeled on and linked to RENPAP.

Approved	**Signature:**	**Date:**	**Name and Title:**
On behalf of *The Government of:*			
Ghana			
Nigeria			
Sierra Leone		14th April 2014	Dr. Joseph Sam Sesay – MINISTER
On behalf of UNIDO:		4/3/2014	Akmel Prosper Akpa UNIDO AMC Chairman