FOREWORD

The world today is characterised by tensions, contrasts and complexity, decreasing resources and increasing demand and tremendous technological progress. In addition to these, the gap between the rich and the poor keeps growing both within countries and between them. Against this turbulent backdrop, health policy-makers and systems managers have a responsibility of securing adequate resources for the health sector to deliver quality health services, allocate them wisely, set and maintain standards, monitor performance, review options for change as well as design and implement reforms. This policy document identifies some of the most important issues in the development and reform of health policies and the kind of actions needed to help us move forward in a positive direction.

This pesticide policy is developed in collaboration with line ministries, interventional agencies (multilateral) and bilateral donors both at the global and national levels. It is to these groups we address this pesticide policy. We ask for their attention and support in order to produce and effectively share greater knowledge about developing and sustaining our health systems that are capable of delivering quality services in an equitable, efficient and responsive way and ultimately achieve health MDGs and their subsequent SDGs.

Our concerted efforts in strengthening the health sector are critical to the achievement of His Excellency's Agenda for Prosperity, through a path to recovery that is outlined in the President's 10-24 months plan. This policy recognizes that effective and efficient management of pesticides is a concerted effort that requires inter-department coordination from a range of team players. The responsibility for the enforcement of pesticides regulation will be shared among various Ministries and Agencies, with the Ministry of Agriculture, Forestry and Food Security (MAFFS) and the Ministry of Health and Sanitation (MoHS) having the statutory responsibility of implementing the policy.

To operationalize the partnership arrangement, the MAFFS and MoHS, and various ministries and agencies will develop inter-departmental Memorandum of Understanding (MoU) intended to foster a strong working relationship between the parties, by delineating our respective responsibilities and identifying areas of mutual interest. My Ministry looks forward to an even stronger working relationship with the different players in the implementation of this policy and hopes to count on the support of all partners on this journey.

Honourable Dr Abu Bakarr Fofanah
Minister of Health and Sanitation
Freetown
14 November 2016

ACKNOWLEDGEMENT

This National Integrated Pesticides Management Policy will serve as guidelines to support future legislation and regulation frameworks on pesticides. Such regulation shall cover production, packaging, labelling, importation, storage, sale, distribution, transportation, use and safe disposal in Sierra Leone. It will also provide decision-makers with direction by setting out a framework to guarantee improvements that are aimed at ensuring that pesticides are used and disposed of throughout their full life-cycle in ways that pose no adverse effects on human health and the environment.

The ultimate goal of the national pesticide management policy is to achieve effective, safe and sustainable vector-borne disease, agricultural, household and public health nuisance pests' management systems. The objectives include providing clear evidence-based communications that meet the needs of our implementing partners, health and agriculture professionals and ensuring that those working in Primary Health Care are provided with the support required to provide quality health services to the people of Sierra Leone.

As with all policy documents, MOHS is fortunate to have had multiple individuals and institutions contribute to the development of the National Integrated Pesticides Management Policy. I would like to thank all the staff who drafted the sections and the individual specialists who provided technical assistance. I also wish to thank the Technical Working Group for their time and efforts in providing guidance. Among the specialists are Dr. Ibrahim M. O. Shamie and Prof. Bailah Leigh. The contribution of the Technical Working Group led to the final version of the document.

Appreciation is also due to the Directorate of Primary Health Care, Pest Control Unit of the Ministry of Agriculture, Forestry and Food Security and to innumerable colleagues, agencies, NGOs, and donors. In addition, I must acknowledge the financial and technical support provided by WHO in the development and printing of this pesticides policy.

Lastly, I thank the staff of the Directorate of Environmental Health and Sanitation for the leadership provided throughout the process.

Chief Medical Officer
Freetown
14 November 2016

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ACRONYMS AND ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
CDTI	Community directed treatment with Ivermectin
DAOs	District Agricultural Officers
DDT	Dichlorodiphenyltrichloroethane
EPA-SL	Environmental Protection Agency Sierra Leone
GHS	Globally harmonized System
GOSL	Government of Sierra Leone
HIV	Human Immunodeficiency Virus
IQC	Inspection and Quarantine Certificate
IRS	Indoor residual spraying
ITNs	Insecticide treated nets
IVM	Integrated Vector Management
L LINs	Long Lasting Insecticidal Nets
LF	Lymphatic filariasis
MAFFS	Ministry of Agriculture, Forestry and Food Security
MDA	Mass Drug Administration
MDG	Millennium Development Goal.
MoHS	Ministry of Health and Sanitation
MoU	Memorandum of Understanding
NFSL	National Food Safety Law
NGOs	Non-Governmental Organizations
NMCP	National Malaria Control Programme
NPPD	National Plant Protection Division
NTD	Neglected Tropical disease
NTDCP	Neglected Tropical Diseases Control Programme
OHSA	Occupational Health and Safety Act
Oncho	Onchocerciasis
PHPs	Public Health Pesticides
PIC	Prior Informed Consent Procedure
PMC	Pesticide Management Committee
POPs	Persistent Organic Pollutants
SCH	Schistosomiasis
SLDHS	Sierra Leone Health and Demographic Survey
STHs	Soil Transmitted Helminths
UNICEF	United Nations Children Fund
WHO	World Health Organization
WHOPES	World Health Organization Pesticide Evaluation Scheme
WTO	World Trade Organization

National Integrated Pesticides Management Policy for Sierra Leone

December 2016

1.0 INTRODUCTION

1.1 Background

The Republic of Sierra Leone is one of the 54 countries in Africa. It is situated on the west coast and shares borders with Guinea and Liberia.

The country's total surface area is about 72,000 squares Km, and its 400 km coastline overlooks the North Atlantic Ocean. The country is divided into 4 provinces (Eastern, Northern, Southern and Western area). There are 13 districts comprising rural and urban areas, and each district is divided into chiefdoms and each chiefdom is presided over by a Paramount Chief. Chiefdoms are further divided into Sections and villages, which are headed by section Chiefs and village Headmen respectively. A map of Sierra Leone showing the thirteen (13) districts is shown below:

The Republic of Sierra Leone has an estimated population of 5.9 million people, of which 37% reside in urban areas. The average annual growth rate is about 2%, and, the country is experiencing significant rural to urban migration, leading to an estimated urbanization rate of 2.9%. The female population accounts for 52% of the total population with an average total fertility rate of 5.1 children per woman. Women of the reproductive age group (15-49 years) constitute approximately 25% of the population. Adolescents and youth represent about 55% of the population, and infants and children less than 5 years of age constitute 4% and 16%, respectively.

The adult literacy rate is estimated at 27% for women and 45% for men. There are about 20 distinct language groups in Sierra Leone, reflecting the diversity of cultural traditions. According to the 2012 World Bank's ranking, Sierra Leone is one of the poorest countries in the world, with 68% of the population living below the poverty line. The long civil war that lasted from 1993 to 2002 (9 years), had a devastating effect on the economy and the socio-economic development of the nation.

1.2 GENERAL SECTOR CHARACTERISTICS

1.2.1 Health system characteristics.

The health status of the people of Sierra Leone is still amongst the poorest in the world. The infant and maternal mortality rates of Sierra Leone remain among the highest in the world. According to the Sierra Leone Demographic Health survey (SLDHS) 2008, the life expectancy is 47 years. Also, according to the survey, the infant mortality rate is 89 per 1,000 live births, the under-five mortality rate is 140 per 1,000 live births, and the maternal mortality rate is 857 per 100,000 births. Sierra Leone's fertility rates are also quite high due to low contraceptive prevalence rates.

Malaria and neglected tropical diseases (NTDs) such as Schistosomiasis (SCH), Onchocerciasis (ONCHO), Lymphatic filariasis (LF) and soil transmitted helminths (STHs) attribute to a significant proportion of disease burden in Sierra Leone. Malaria, ONCHO, LF and STHs are endemic in all the 13 districts, and thus, the whole population is at risk of infection. In spite of the fact that these diseases are preventable and controllable, they continue to cause unacceptably high morbidity and mortality in the country. In response to this situation the Government of Sierra Leone has designed policies and strategies to systematically control and ultimately eliminate these diseases. However, implementation of systematically integrated prevention and control strategies remains to be strengthened.

1.2.2. Agricultural Sector Characteristics

1.2.2.1 Food security

The principal role of the Ministry of Agriculture, Forestry and Food Security (MAFFS) is to achieve sustainable food security and reduce poverty through agricultural intensification, diversification and the efficient management of the natural resource base. MAFFS has the mandate to support the production of all crops and livestock in an environmentally sustainable manner and to ensure the achievement of food security in the country. To underscore this genuine commitment to the development of the nation's Agriculture and eventual

alleviation of poverty; His Excellency the President, President (Dr.) Ernest Bai Koroma, created the portfolio of "Food Security" under the Ministry of Agriculture and Forestry (MAF).

1.2.2.2 Phytosanitary issues

The government is developing a phytosanitary policy that incorporates the following thematic areas:

1.2.2.2.1 Legislative and Regulatory Framework

The government of Sierra Leone has the autonomous right to regulate plant imports to achieve the appropriate level of protection for cultivated and wild flora in a way that is compatible with its international obligations. Rights, obligations and responsibilities associated with international agreements must be upheld. The principles and standards that concern the structure and implementation of import and export regulatory systems and that are embedded in international agreements such as those propagated by the International Plant Protection Convention (IPPC) (1997), the Inter-African Phytosanitary Council (IAPSC) and the World Trade Organization Agreement on the Application of Sanitary and Phytosanitary Measures (WTO-SPS Agreement), must also be upheld.

The country requires a legal and regulatory system for promoting plant health. Accordingly, the government of Sierra Leone as a matter of policy shall prohibit the introduction of quarantine pests or limit the entry of regulated non-quarantine pests (RNQPs) likely to enter the country with imported consignments and other regulated articles.

1-2-2-2-2 National Phytosanitary Standards

For the purpose of promoting safe international agricultural trade in Sierra Leone, the country requires adherence to international and national standards by importers and exporters. The International Standards for Phytosanitary Measures (ISPMs) are the standards, guidelines and recommendations recognized as the basis for phytosanitary measures applied by members of the World Trade Organization under the agreement on the application of Sanitary and Phytosanitary Measures (the SPS Agreement).

The government shall ensure that national Phytosanitary standards are developed in line with international standards and agreements on the application of Sanitary and Phytosanitary measures, so as to promote international agricultural trade in Sierra Leone.

1-2-2-2-3 Import Certification

The growing demand for foreign or "exotic" agricultural commodities, such as seeds and planting materials, increases the risk of introducing unwanted pests into Sierra Leone. In order to reduce the risk to commercial crop production and the environment from the introduction of plant pests and diseases, agricultural inspectors will be required to make regulatory decisions on items not commonly seen in Sierra Leone. These decisions may include identifying quarantine plant pests and regulated non-quarantine pests. The outcome of such decisions would be the issuance or otherwise of a phytosanitary certificate, which confirms that the goods have been inspected in their country of origin and meet Sierra Leone standards on pests and diseases. Importers must check if a product requires a Phytosanitary Certificate to be allowed entry into the country.

In general, all importations of plants and some categories of plant produce, plant pests, soils and growing media that require customs clearance must be accompanied by a Phytosanitary Certificate. These imports must be pre-notified to the National Plant Protection Division (NPPD) of the Ministry of Agriculture, Forestry and Food Security. A copy and the original Phytosanitary Certificate must be presented to the NPPD. The NPPD shall carry out a document identification and physical inspection of all consignments. If the NPPD is satisfied that all the requirements have been complied with, NPPD shall issue the importer/agent with an 'Inspection and Quarantine Certificate' (IQC), which the importer must forward to Customs to obtain customs clearance for the consignment.

1.2.2.2.5 Import Quarantine System

Plants and plant products imported from foreign countries by means of freight, personal luggage and parcel post etc., are subject to plant quarantine. This is to prevent a possible invasion of pests which may inhabit these plants. This policy will effectively prevent exotic pests from being introduced into the country, reduce the risks of spreading the pests in the country and ensure the reputation of safe agricultural trade. The latter will be done by demanding that a phytosanitary certificate issued by the authorities of the exporting country be attached to the plants and plant materials imported into Sierra Leone. This will show that the plant and plant products have been inspected in the exporting country and that these plants are imported through designated ports of entry.

Sierra Leone shall adopt the practice of "quarantine inspection before customs declaration". All plant imports must be pre-notified to the National Plant Protection Division (NPPD) of the Ministry of Agriculture, Forestry and Food Security. A copy and the original Phytosanitary Certificate must be presented to an officer of the NPPD. The officer shall carry out a

document identification and physical inspection of all consignments. If the officer is satisfied that all requirements have been complied with, NPPD shall issue the importer/agent with an Inspection and Quarantine Certificate (IQC). If any quarantine pests are found during the inspection, NPPD shall issue a non-conformity notice to the importer. It will then either undertake treatment measures such as sterilizing, sorting, eliminating of the pests, burning, deep burying of the plants after informing the importer; or returning of the quarantine objects to the consignee or country of origin.

NPPD shall also advise the Minister of Agriculture, Forestry and Food Security to place quarantine restrictions on importation from any country whose phytosanitary quarantine system it is not satisfied with and any country where some quarantine pests are endemic. The quarantine restriction shall be removed only when NPPD is notified in writing by the phytosanitary authority of that country of the rectification of the threat posed by such pests; and after a visit paid by NPPD to that importing country to track the inspection and quarantine system and certify compliance with plant health standards of that country.

Furthermore, Sierra Leone shall encourage countries importing plant and plant products to visit and support field inspection, and quarantine certification and packaging, prior to shipment from Sierra Leone.

In order to provide healthy propagation materials to farmers and horticulturalists, domestic quarantine will undertake inspections on plant nurseries in-country to certify freedom from viruses and other harmful diseases. Unless the seedlings have passed inspection, their movement to farmers shall be prohibited.

Domestic/Internal Quarantine systems will be established to control, contain or eradicate destructive plant pests originally considered as quarantine pests or regulated plant quarantine pests, which were able to enter the country through infested or infected imported plant material or commodities from distant countries or passively from neighbouring countries.

To ensure knowledge of plant pests that exist in the country there would be continuous monitoring of nurseries, farms, plantations, wild flora and plants and plants products in storage and transportation.

Phytosanitary Inspection System

Global agricultural trade is a major medium for the spread of quarantine plant pests; however, border phytosanitary inspection is a major barrier against the introduction of quarantine pests through imported commodities. Though, there is limited resource allocated to phytosanitary inspection.

Sierra Leone shall develop and implement an efficient and effective phytosanitary inspection system in line with international protocols to prevent the introduction of quarantine pests into the country.

1.2.2.2.6 Plant Pest Management

The policy direction of the plant protection strategy for Sierra Leone will be driven by a clear understanding and adoption of Integrated Plant Management (IPM) principles and practices for the growing of healthy crops. IPM is the most appropriate approach for dealing with pest and disease problems affecting sustainable crop production; it is a systematic, farmer-centered and holistic approach to produce healthy crops/animals in a sustainable way, using a combination of appropriate options (i.e. cultural, physical, biological, chemical) with an emphasis on environmentally friendly and economically sound principles. Decision making in IPM strategies and measures is based on regular monitoring and analysis of pest problems by farmers. The basic philosophy in IPM is the development of pest control methods consistent with our realistic and economic objectives, and to reduce the use of pesticides. IPM can reduce the use of pesticides by avoiding unnecessary chemical applications and by using non-chemical control methods whenever possible.

The use of pesticides is the most effective, convenient and quickest method of controlling pests; however, improper use of pesticides may lead to serious consequences including health hazard to applicators, destruction of natural enemies of pests, development of resistant species of pests, pest resurgence, toxic chemical residues in food, soil and water bodies, and environmental pollution

To ensure an effective control and management of pesticides, there is the need for the promulgation of pesticide management and control law. There is also the need to regulate the importation, registration, distribution, sale and application of pesticides in Sierra Leone.

1.2.2.2.7 Capacity Building and Awareness Creation for Phytosanitary System

Effectiveness and efficiency in operating plant protection projects in a holistic manner in a competitive environment require the appropriate capacity development of human, material and infrastructural resources. Hence, a systematic programme of continuous training and re-tooling including diagnostics and testing laboratories should be developed to enhance the required capacities for the effective implementation of this policy. More entomologists, plant pathologists, toxicologists, and phytosanitary inspection specialists should be trained for this purpose. Additionally, in order to promote phytosanitary behavioral change, it is necessary to create awareness of phytosanitary measures within the general public.

The policy shall facilitate a capacity development plan and provide support for the National Plant Protection Division (NPPD) to carry out its mandate.

In order to realize the full potential and benefit of agricultural international trade, the knowledge of farmers, exporters and importer, and other relevant stakeholders in phytosanitary measures should be improved through provision of relevant information, or and training where necessary. The policy shall build adequate and quality knowledge on phytosanitary measures in relevant stakeholders and the general public for early detection of plant pests in Sierra Leone.

1.2.2.2.8 Resource Mobilization and Partnerships

The government of Sierra Leone is highly committed to the sub-regional, regional and global approaches to prevent and control the spread of pests. The policy shall ensure a broad–based and all-inclusive approach including the involvement of all stakeholders in its implementation. Due to the movement of plant and plant materials across borders, the government shall promote regional dialogue and international co-operation for early detection and identification of pests to prevent adverse impacts of these pests. Strong advocacy shall be conducted with development partners who will have a greater involvement in the implementation of this policy. The government agencies and institutions shall ensure increased collaboration in sourcing resources and technical assistance necessary for the implementation of support programmes throughout the country.

In accordance with the spirit and content of this policy, the government of Sierra Leone shall advocate for increased funding for implementation of sanitary and phytosanitary measures and support programmes.

All relevant partners shall be identified and their specific roles defined and agreed upon.

1.2.2.2.9 Research, Monitoring and Evaluation

The rate of introduction and establishment of new, economically and environmentally damaging plant pests, diseases and invasive species is steadily increasing as the volume and diversity of trade in plant material becomes more global. Sierra Leone as part of the global community is no exception. However, phytosanitary research activities and funding is not increasing in spite of the threats posed by these pests. This situation has negative repercussion for the development of sustainable programmes and projects for effective implementation of this policy.

Currently, Njala University, and Sierra Leone Agricultural Research Institute carry out agricultural research. These institutions lack required requisite scientific staff and appropriate level of funding for their research activities. Their phytosanitary research projects are not coordinated. This policy shall facilitate a programme for phytosanitary research and the use of research findings for reaching appropriate decisions for project development and implementation in Sierra Leone.

Surveillance must be an integral part of pest control and eradication programmes. Surveillance provides information to support sound regulatory decisions and programs. The policy shall detect and identify plant pests for effective management decision making and to minimize the adverse and unintended effects of these pests.

The pest detection program protects a country's agricultural and ecological resources by ensuring the early detection of harmful or economically significant plant pests and weeds that occur naturally, or are accidentally or intentionally introduced into the country. A strong national domestic agricultural pest detection system provides a continuum of surveillance from offshore pre-clearance programs through port inspections to surveys in rural and urban sites across the country. While most plant pest introductions occur accidentally as a consequence of increased global travel and trade, deliberate introductions may occur from time to time.

Plant pests and diseases are mobile and with no respect for national borders. It is therefore imperative to investigate the occurrence of a pest, evaluate the potential introduction of a pest and make appropriate decisions to avoid or reduce the probability of entry or establishment of the pest into the country.

1.2.2.2.10 Phytosanitary Laboratory Services

There is the need for a modern laboratory with the necessary equipment and staff, in order to conduct taxonomic work for the accurate identification of pests, which are intercepted during plant import inspection, collected during surveys or other pest control activities including those reported by farmers and other producers and for pesticide analysis. Qualified persons in the various fields of plant protection, such as, entomology, plant pathology, and where possible weed science and plant quarantine inspection should be employed, where this is not available, promising ones should be recruited and trained. The staff should also include chemists or toxicologists.

1.2.2.3 Agricultural crop pesticides/herbicides

In an emergency pest outbreak, the tendency to use different types of pesticides remains high. During an emergency, large quantities of pesticides are normally allowed entry into the country without regard for the nation's pesticide regulatory system. Though some of such pesticides may not be required for the particular pest, they are allowed because there is an emergency pest outbreak and the authorities want it to be controlled in the shortest possible time. Most of such pesticides would remain unused after the whole exercise has been completed and the question concerning what to do with such pesticides would remains unanswered.

Pesticides are poisonous substances or combination of substances to cause death on living organisms. Like every other medication, their usefulness depends on proper application as prescribed for each individual pesticide. They are dangerous when they are not properly applied, handled, stored or disposed off.

The use of synthetic pesticides in agriculture is perhaps the most widespread method of pest management. However, environmental and human health problems relating to the use of pesticides have created an increasing pressure against their use. For a better understanding of pesticides, there is a need for us to first see how they are grouped based on their synthetic or biological properties, their various mode of action and effects.

1.2.2.3.1 Pesticide storage management

Pesticide storage areas can contain a wide range of concentrated chemicals, some in relatively large quantities. These chemicals must be stored and managed properly to prevent potential release; through broken, damaged or leaking containers of chemicals that may have the potential to cause harm to human health and the environment. Some potential problems associated with pesticide storage areas include risk of spills during storage, mixing or loading operations; loss of security; accumulation of unwanted, old, or unregistered materials; and the risk of fire, flooding or some other disastrous events. These problems can be minimized through the proper use of building security, temperature control, fire prevention and, inventory control, secondary containment, emergency mitigation/planning, preventive maintenance, good housekeeping, and user education.

1.2.2.3.2 Safe disposal of pesticides

Pesticides that can no longer be used for any purpose are dangerous toxic waste. But it is not just pesticides that are dangerous, pesticide containers such as paper packets, cans, sacks, plastics, bottles, etc, are also dangerous. These old containers can be as dangerous as the pesticides themselves as

such empty containers are often used to store food, water or palm wine. Often stocks of old pesticides are poorly stored and toxic chemicals leak into the environment, turning potentially fertile soil into hazardous waste. When measures are taken to dispose of empty containers or expired pesticides, they are often not appropriate. For example, many pesticide suppliers recommend the burying or burning of waste pesticides and empty containers; but, buried chemical waste can contaminate soil and ground water and highly toxic fumes are released into the atmosphere when pesticides and their containers are burned

Often pesticides, empty containers and contaminated materials are dumped in landfills or other general waste collection sites. Most of these sites aren't designed to prevent toxic materials from leaking into the ground or being washed out by rain into water bodies. Such sites are also usually scavenged and useful items such as pesticide containers are reclaimed and used to store other items, such as food. Under the International Code of Conduct on the Distribution and Use of Pesticides, manufacturers and distributors of pesticides are expected to provide facilities that allow pesticide users to dispose of empty containers and pesticide related waste materials safely.

1.2.2.4 Animal Protection pesticides-Dips, etc

So far there is no documented regulatory mechanism for this category of pesticides in Sierra Leone. The government of Sierra Leone shall institute measures to establish the availability of these pesticides and regulate their importation into the country in line with the relevant regulatory system.

1.2.2.5 Wild life and marine issues

Currently there is no documented regulatory mechanism for pesticides with respect to wildlife and marine resources in Sierra Leone.

The government of Sierra Leone shall institute measures to establish the availability of such pesticides and regulate their use and importation into the country in line with the relevant regulatory system.

1.3 GLOBAL SITUATION OF VECTOR BORNE DISEASES AND PESTICIDE USE

Every year, hundreds of millions of cases of insect-, snail- and rodent-borne diseases occur, representing a major threat to global public health. Vector-borne diseases account for about 17% of the estimated global burden of infectious diseases. Operational, financial and managerial problems, together with environmental change, pesticide resistance and increasing population mobility have contributed to increases in the prevalence of many of these diseases in recent decades. Diseases that are usually transmitted

via vectors or intermediate hosts include dengue, filariasis, Japanese encephalitis, leishmaniasis, malaria, onchocerciasis, schistosomiasis and trypanosomiasis. In addition, it has recently been confirmed that domestic flies play a significant role in the mechanical transmission of diarrhea diseases and trachoma. Although these two diseases are also transmitted by other routes, they are such important causes of child death and blindness that domestic flies should be considered of major significance as disease vectors.

Vector control is an important component of many vector-borne disease control programmes. Its implementation includes targeted site-specific use of the available methods, predicated on technical and operational feasibility, resources and infrastructure. They should be applied in accordance with the principles of integrated vector management, an evidence-based decision-making process adapted to local settings. It rationalizes the use of vector control methods and resources and emphasizes the involvement of communities.

In many countries with endemic infestation with pests, vector control strategies have evolved from large, centrally organized vertical programmes to decentralized programmes integrated into general health services. The dwindling funding of safe, cost-effective pesticides for public health use, increasing concern about the environmental and safety implications of the widespread use of chemicals, and the need to use increasingly more limited health sector funds to the maximum benefit has resulted in greater emphasis on the judicious use of pesticides. Thus, non-chemical measures are the first option, and use of chemical interventions is considered only when necessary. The selection and use of different chemical and non-chemical methods for vector and pest control should be based on their efficacy, sustainability and cost-effectiveness.

Nevertheless, despite the growing contribution of alternative measures, chemical control will continue to play a vital role in vector-borne disease control, particularly when rapid, effective control is essential, such as during disease epidemics.

Community-based vector-borne disease control has received greater emphasis in recent years. Notably, the demonstration that insecticide-treated mosquito nets can reduce mortality and morbidity due to malaria, led to the promotion of net use in many malarial areas. Greater attention has also been paid to personal and household protection from insect vectors and intermediate rodent hosts, and to community participation in eliminating vector breeding sites. The provision of information on simple, effective, acceptable methods for reducing the sources of vectors and for personal protection at a reasonable cost is an important part of vector control programmes.

Four classes of chemical insecticides: the organochlorines, the organophosphates, the carbamates and the pyrethroids are still the mainstay of vector control programmes. Use of pyrethroid insecticides has however increased, and that of the organochlorines and some of the more toxic organophosphate compounds has decreased in recent years.

The continued use of DDT for disease vector control is conditionally approved under the Stockholm Convention on Persistent Organic Pollutants (4), in accordance with WHO recommendations and guidelines, and when locally safe, effective and affordable alternatives are not available.

Use of the bacterial insecticides, Bacillus thuringiensis israelensis (serotype H-14) and B. sphaericus has increased in response to the demand for safe, pest-specific compounds.

Although these materials are considered to be biopesticides, they are considered with chemical insecticides as larvicides for control of mosquitoes and black flies. Insect growth regulators have also become more widely used in recent years.

Insect growth regulators have been most widely used against mosquito vectors, although they are active against a wide range of public health pests. These compounds show extremely little toxicity to humans. However, some insect growth regulators adversely affect aquatic crustaceans and species closely related to mosquitoes which share the same habitats, some of which may be predators for mosquito larvae, thus keeping vector populations down in a naturally balanced situation.

Pesticides are widely used to control the growth, development and proliferation of undesirable organisms. Based on the target pest, they are categorized as insecticides, fungicides, rodenticides, miticides, herbicides/weedicides etc. If applied selectively and responsibly, the use of pesticides could prove the most effective, convenient, and quickest method of controlling pests. However, owing to the fact that they are designed to be biologically active, pesticides have potentials to cause undesirable side effects.

Improper use of pesticides may lead to serious consequences like health hazards to applicators, consumers, community health and safety; destruction of natural enemies of pests; development of resistant species of pests; pest resurgence; toxic chemical residues in food, soil and water bodies; damage to forests; significant damage to ornamentals and landscape plants, building structures; pollution of the environment, and non-target wildlife organisms.

The use of pesticides in both agricultural and public health settings provides important benefits to society, contribution to an abundant supply of food and to the control of a variety of public health hazards and nuisance pests.

In addition, the use of pesticide raises concerns about their persistence and accumulation in food chains quite distant from the original point of use, and their effects on both wildlife and humans and other species that are not their intended targets. It is therefore, important to control the use of pesticides, by carefully weighing the benefits that they confer against any possible adverse effects.

1.4. SITUATION OF PESTICIDE MANAGEMENT IN SIERRA LEONE

Generally, the use of pesticides in Sierra Leone is very low with less than 1% of farmers applying pesticides for pest and disease control. Notwithstanding the rather insignificant use of pesticides to control pests and diseases, pesticide contamination of food and water bodies is a problem in Sierra Leone. There are several reported cases of pesticide-related accidents in Sierra Leone. These include:

a. Death of humans and wild life
b. Death of aquatic live especially fish
c. General illness
d. Skin and eye irritations

In a recent situation analysis, there were reported cases of ineffectiveness of pesticides against certain plant pests (e.g. Malathion against grasshoppers).

There is no legal framework to regulate the importation, registration, distribution, sale and application of pesticides in Sierra Leone. Currently there is no public laboratory facility for the monitoring of pesticide residues in food, water and the environment. In this light, the government of Sierra Leone should establish a well equipped and accredited pesticide laboratory for pesticide quality and residue analysis.

Several governmental institutions, agencies and other stakeholders should be involved in the policy formulation, management and control of pesticides. The Pesticide Law should spell out clearly the major executing body and other supporting institutions, agencies and committees with shared tasks for the effective management and control of pesticides in Sierra Leone. The relevant stakeholders in pesticide industry; that is, inspectors, farmers, input dealers, manufacturers, and pest control operators in both the private and the public sector, need to be trained in safe handling and application of pesticides. In order to ensure effective regulatory

process and to meet the needs of the regulatory and implementing agencies, adequate funding should be provided for infrastructure, equipment, transportation and other operational costs.

1.4.1 Vector borne diseases profile in Sierra Leone

The predominant vector borne diseases in Sierra Leone are: Malaria, Schistosomiasis (SCH), Onchocerciasis (Oncho) and Lymphatic filariasis (LF), account for the bulk of its disease burden. Some vector borne diseases are endemic in the whole country, while others are localized in certain parts where they contribute to the disease burden in the local communities.

Malaria is by far the most important vector borne disease which is endemic in the whole country, including the cities. The most vulnerable groups include children under five years and pregnant women.

Malaria control has so far achieved significant progress especially in the areas of prevention. In November 2010, Sierra Leone conducted a one-week National Integrated Maternal and Child Health Campaign to provide health interventions, which included distribution of over 3.2 million long-lasting insecticide-treated nets (LLINs) to all households in the country, and was aimed at achieving 100 percent household possession of LLINs. In addition to the distribution of LLINs the NMCP also launched the Indoor Residual Spraying Programme in four pilot districts in December 2010.

Regarding the NTDs, in 2006 the MOHS produced a national plan of action for integrated control of ONCHO, SCH, STH and LF. The plan aims to eliminate LF by 2015 and to reduce morbidity due to ONCHO, SCH and STHs to levels where the diseases are no longer of public health significance. The main strategy is mass drug administration (MDA) through community directed treatment (CDTI) and or school based approach. However, the strategies targeting vectors of LF, Oncho, and SCH have not been incorporated in the Plan of Action. MDA alone is unlikely to interrupt disease transmission for some of the NTDs (e.g. SCH) or will take a very long time to do so (e.g. ONCHO). Schistosomiasis, Onchocerciasis and lymphatic filariasis are among the major neglected tropical diseases (NTDs) that are widespread in the country.

Schistosomiasis studies conducted in all 13 health districts of the country in 2008 showed that 7 districts (Kono, Kailahun, Kenema, Bo, Koinadugu, Tonkolili and Bombali) have high enough prevalence of Schistosoma haematobium and Schistosoma mansoni to be targeted for mass drug administration (MDA) of Praziquantel. This will be conducted at school and community levels.

Onchocerciasis, the 4th leading cause of blindness after cataract, trachoma and glaucoma, is endemic in the 12 provincial health districts. The Forest type of the disease is distributed in Eastern parts of the country, while the Savanna type is found in the North. A mixture of the two types is found in the Southern region. The national prevalence of Oncho is around 46%. MDA is conducted for Oncho except in the Western Area (the only district where the disease is not endemic).

Lymphatic Filariasis is also highly endemic in Sierra Leone. According to a survey conducted for mapping of the disease in all districts of the country in 2005 using immuno-chromatographic test cards, the national average prevalence is 21% and all 13 health districts of Sierra Leone are endemic for LF. Oncho and LF are co-endemic in 12 out of the 13 health districts and preventive chemotherapy with Ivermectin and Albendazole is justified annually in all 13 districts of Sierra Leone including urban areas such as Freetown and district headquarter towns.

Trypanosomiasis has not been considered a disease of importance in Sierra Leone as there have been no cases reported for many years. However, the recent reported resurgence of the disease in neighbouring countries calls for systematic surveillance, particularly in border areas, to be able to control transmission through the appropriate vector control interventions, should the disease reappear.

In spite of such a heavy burden of malaria and neglected tropical diseases (NTDs), control of vector borne diseases in Sierra Leone is focusing mainly on case management and mass drug administration (MDA). More efforts should be made to reduce and interrupt disease transmission.

1.4.2 Household and Commercial pesticide use

While the use of insecticides, for instance as aerosols, is widely practiced in Sierra Leone, so far there is no documentation of the extent of their use by individuals at household level , nor is there any official information of their use at commercial levels.

The government of Sierra Leone shall institute measures to determine the availability and use of insecticides and regulate their importation into the country in line with the relevant regulatory system.

1.5 RATIONALE FOR POLICY DEVELOPMENT

All the pesticide products presently imported into and used in Sierra Leone have not gone through any form of registration or evaluation. Currently, there are no regulations on the importation and distribution of pesticides and agro-chemicals. Individuals can bring any type and quantity of pesticides and agro-chemicals into the country regardless of their potential harmful effect on plants, humans and the environment. Their safety therefore, has not been assessed to bring them in line with national standards risk assessment. The absence of effective management of pesticides to ensure that they are used in ways that lead to the minimization of significant adverse effects on human health and the environment is of concern.

The perception of consumers, nationally as well as internationally, demands a move towards pesticide residue-free agricultural produce. In this light, policies for safe and effective use of pesticides are urgently required; this is necessary to eliminate all significant risks to human health and the environment potentially from pesticides use. Human health, environmental quality and economic development among other things depend on effective systems that enable Sierra Leone to manage and use pesticides safely and sustainably. Effective systems are those that identify the potential impacts that pesticide use may have on human health and the environment and provide government, industry and the community with correct tools to reduce and manage those impacts.

The existence of multiple vector borne diseases and their high level of endemicity in Sierra Leone warrant comprehensive, integrated and systematic implementation. Multiple vector control interventions within the concept of integrated vector management (IVM) are therefore advised.

IVM will facilitate the use of existing resources and capacities to control multiple vector borne diseases through integrated delivery of vector control interventions, and among others, involving all stakeholders, engaging communities, and using local resources. Therefore, the policy must take into consideration global competitions, hence sustainable development, balanced economic growth, equitable access and long-term environmental sustainability should be well thought-out.

This Policy will provide necessary information and will serve as guidelines to support future legislation and regulation frameworks on pesticides; such regulation shall cover production, packaging and labeling, importation, storage, sale, distribution, transportation, use, and safe disposal in Sierra Leone.

It will provide direction and guidance to major vector borne diseases control programmes such as the National Malaria Control Programme (NMCP) and the Neglected Tropical Diseases Control Programme (NTDCP) of the Ministry of Health and Sanitation (MOHS) and its Development Partners for a comprehensive and consolidated approach to the implementation of vector control interventions within the context of IVM in Sierra Leone.

The policy will also provide decision-makers with direction and framework for the usage and effective disposal of pesticides throughout their full life-cycle without significant adverse effects on human health and the environment.

2.0 VISION

To create functional national systems that protects integrity of the environment and health of the people in Sierra Leone

2.1 MISSION STATEMENT

To ensure that available resources (human, financial, and material) are maximally utilized to provide quality, affordable and accessible pesticide management services to the people of Sierra Leone, whiles minimizing resistance and ensuring extended use of available pesticide actives.

3.0 GOALS AND OBJECTIVES OF THE POLICY

The ultimate goal of the national pesticide management policy is to achieve effective, safe and sustainable vector-borne disease, agricultural, household, and public health nuisance pests' management systems.

3.1 OBJECTIVES

The Objectives of this policy are as stated below:

a. To achieve agricultural and public health objectives, with respect to lowering of the burden of vector-borne diseases;
b. To optimize and rationalize the use of resources and tools for nuisance pest and vector control, and where possible reduce reliance on chemical control;
c. To ensure regulatory control over the production, importation, distribution, sale, transportation, export, use, and safe disposal of public health, agricultural and household pesticides with the aim of minimizing risks to human health and the environment;
d. To create an enabling environment for sound public health, agricultural and household pesticide management through advocacy and resource

mobilization;

e. To advocate for enactment of relevant laws and an enabling legal environment that will ensure that people are better protected from health and environmental risks posed by pesticides;
f. To encourage the development and use of alternative products and techniques and reduce dependence on chemical plant protection products;
g. To integrate relevant international agreements and initiatives from other government departments;
h. To foster increased transparency, access to information and improve public participation in the importation, distribution, sale and registration of pesticides.
i. To minimize the development of vector tolerance and resistance to pesticides thereby enhancing the lifespan of present actives

These objectives will be achieved through partnerships between Government and government agencies, that is, Ministry of Agriculture, Forestry and Food Security, Ministry of Health and Sanitation, and Ministry of Trade and Industry; Environmental Protection Agency, Sierra Leone (EPA-SL); importers and pesticide dealers; farmers; Community Based Organizations; Civil Society; Non-Governmental Organizations; Consumer protection groups and other stakeholders.

4.0 POLICY TO ADDRESS THE PROBLEM

The objectives of the policy will be achieved through the application of relevant and existing international agreements, policies and regulatory frameworks, including the intended outcomes of a pesticide management policy, with particular reference to the following:

4.1 Protection of human and promotion of non-toxic environment

The Ministry of Agriculture, Forestry and Food Security and the Ministry of Health & Sanitation shall use sound scientific criteria that are generally acceptable worldwide. This must be the foundation stone of the regulatory decision-making process.

Regulatory decisions will be made, using a risk management approach that will involve thorough risk assessment. The evaluation process will focus on whether the health and environmental risks posed by a pesticide falls within internationally acceptable range, and whether the product offers a worthwhile contribution to effective pest management.

Pesticides that pose unmanageable risk should be considered for severe restriction and ban in Sierra Leone. Such pesticides include those with

Persistent Organic Pollutants properties (see annex for details), as well as pesticides associated with frequent and severe poisoning incidents. The MAFFS and MoHS, in collaboration with other stakeholders, shall develop and implement comprehensive strategy for judicious and safe use of pesticides through their life cycle.

4.2 Pesticide Management

Government shall promulgate a Pesticide Control and Management Act with an instrument for its enforcement. This Act will be detailed, taking care of each operational activity such as production, packaging and labeling, importation, storage, sale, registration, distribution, transportation, use and safe disposal in Sierra Leone. A Pesticide Management Committee (PMC) will be established within the relevant Ministry as the Control Authority; and all pesticides imported into the country registered for effective regulation.

In line with this, legislation and regulations framework should be developed to permit the provisions of information exchange with the public about pesticide risks as well as to facilitate the participation of the public in the management of all types of pesticides in the country. Provisions would then be made in the legislation for its effective monitoring and enforcement, including the establishment of appropriate education, advisory extension and sensitization of the community.

4.3 Registration of dealers in pesticides

All dealers in pesticides must be registered, and the licenses must be renewed every year. Dealers will have to apply for license for the importation and distribution of all types of pesticides. Information required in applying for registration may include:

a. Address of the company/person wishing to import pesticides
b. Names and qualifications of the responsible persons in that company
c. List of pesticides to be handled under the license
d. Description of technical storage and handling facilities
e. All other requirements relevant to safe management of pesticides

Licenses may be suspended or cancelled if the conditions are not fulfilled at a certain point.

4.4 Registration of pesticides

The types and quantities of pesticides entering Sierra Leone should be registered, this will help the management to know the location, quantity and type of pesticides in the country viz a viz the safety of the people and the environment. Registration with the designated authority should be a basic requirement for the importation, advertising and selling of individual pesticides.

Exemption may be possible if an unregistered pesticide is to be used for research or for a national emergency programme. The actual registration process of pesticides should start as soon as the Act is put into effect. An application is required to provide information including clear details (as listed above) on the applicant and the pesticide intended for import.

4.4.1 Importation

Importers will apply for registration and wait for approval by the designated authority before proceeding on importation. Information must be provided on whether the pesticide meets the requirements on effectiveness, toxicity level and environmental effects. This information should be supported with documents either from the country where the manufacturer is based or through records of trials under similar conditions other than Sierra Leone.

When an application meets all importation requirements, an approval letter valid for a stipulated period will be issued to the applicant. Within that period, the company or individual will be allowed to import the quantities stated on the application form of a registered pesticide. An import license valid for the applied quantity in one or more shipments will then be issued. The license for a particular pesticide will be given only to the applicant. Other persons who want to distribute the same pesticide will have to go through the registration process separately.

The relevant Pesticide Control Authority will keep a register of all pesticides permitted for import which should be published at least once per year in the government gazette. Imported pesticides, which do not meet the quality, regulations, product labeling, or other set requirements should be refused entry into Sierra Leone.

Under the Act, offenders should be fined. Illegal actions will include among the following:

a. Importation and distribution of unregistered pesticides
b. Importation, distribution and selling by an unregistered person or company
c. Altering registered pesticides
d. Distribution of pesticides of doubtful quality
e. Incorrect labeling and packaging.

4.4.2 Monitoring

The Customs and Excise department of the National Revenue Authority (NRA) and the Sierra Leone Police Force will work in collaboration with the relevant Pesticide Control Authority to enforce the law. Staff of the relevant Pesticide Control Authority will monitor the pesticide market as regards to compliance, post-registration, quality control, and dates of expiry of individual pesticides, etc.

5.0 REGULATORY FRAMEWORK

5.1 Strengthening of legal basis for management of Pesticides

The government of Sierra Leone has the sovereign right to make laws for the management of all forms of pesticides. In this regard there is a need for advocacy and awareness raising to obtain political commitment.

The Customs and Excise department of the National Revenue Authority (NRA) and the Sierra Leone Police Force should work in collaboration with the Environmental health officers of the MoHS to enforce the law.

Well equipped and up-to-date laboratory facilities should be employed for quality control checks. This should be available in the port of entry and in the manufacturing and use institutions.

5.2 Reducing illegal imports of pesticides

The trade in illegal and counterfeit pesticides is a major concern in the Region, and it requires adequate legislation and capacity for enforcement.

a. The government shall build awareness and ensure community education and sensitization on risks of using illegal pesticides.
b. The government shall establish licensing scheme for pesticide distribution and sales and impose fines for illegal imports.
c. The government shall build effective compliance monitoring and enforcement mechanisms.

5.2.1 Certification of imported pesticides

The government shall ensure the issuance or otherwise of an appropriate certificate, which confirms that imported pesticides have been inspected and certified as of good quality in their country of origin and that they meet the required standards for importation into Sierra Leone . It is the onus of importers to check if a product requires such a **Certificate** to be allowed entry into the country.

All imports must be pre-notified to the designated authority in the relevant Ministry which shall carry out a document identification and physical inspection and certification of all consignments. If that authority is satisfied that all the requirements have been complied with, it shall issue the importer/agent with the appropriate Certificate, which the importer must forward to Customs to obtain customs clearance for the consignment. Without such certification, no pesticide may be allowed entry into Sierra Leone.

5.3 Reducing presence of substandard pesticides

The use of substandard pesticide products can result in ineffective pest or vector control operations, leading to increasing application rates and costs. It may also lead to the development of pest resistance to pesticides or aggravate existing problems. In addition, substandard pesticide products may seriously increase the risk to users and the environment as these products may contain impurities/chemicals that can increase the toxicity of the product to humans and other non-target organisms. This could be remedied by the following methods:

a. Raise awareness on risks of using substandard pesticides
b. Set quality standards for pesticides.
c. Use WHO pesticide quality specifications where available.
d. Establish effective national pesticide quality control system.
e. MOHS shall collaborate with Ministry of Agriculture, Ministry of Lands, Country Planning and the Environment, the Sierra Leone Environment Protection Agency, the Private Sector and all other relevant institutions to minimize importation and use of sub-standard pesticides and misuse of pesticides.

For the purpose of promoting international trade, there is need for adherence to international and national standards by importers and exporters.

5.3.1 Development of national standards

Government shall ensure that national standards are developed in line with international standards and agreements. The standard will take into consideration issues concerning registration of agents and products, control of importation, and application of pesticide management measures that will promote international trade.

5.4 Increasing cost effectiveness of vector control

The predominant vector borne diseases in Sierra Leone are malaria, Schistosomiasis (SCH), Onchocerciasis (Oncho) and lymphatic filariasis (LF). They account for the bulk of its disease burden. Some vector borne diseases are endemic in the whole country while others are localized in certain parts, where they contribute to the disease burden in the local communities.

In spite of such a heavy burden of malaria and neglected tropical diseases (NTDs), control of vector borne diseases in Sierra Leone is focusing mainly on case management and mass drug administration (MDA). More efforts should be made to reduce and interrupt disease transmission. There is a current global movement to scale up malaria control interventions to ensure universal access by all populations at risk of the disease and a renewed interest to control and eliminate neglected tropical diseases (NTDs). Therefore, the Government of Sierra Leone has recently developed a policy to guide the implementation of vector control interventions in the context of Integrated Vector Management (IVM) as part of the comprehensive vector borne diseases control strategy in the country.

5.4.1 Implementation of vector control interventions

a. Register more products for the same use thus promoting increased competition.
b. Establish IVM projects.
c. MoHS shall promote IVM and establish the necessary systems and mechanisms for safe and appropriate management of pesticides, used for all insecticide-based IVM interventions, prior to the launch of the relevant interventions.
d. MoHS shall build the required technical and material capacity especially of vector control staff at all levels for proper and safe management of the appropriate pesticides.
e. MoHS shall ensure that the norms and guidelines set by the World Health Organization (WHO) with regards to the management of pesticides are adhered to by those involved in the control of vector borne diseases with the application of insecticides at all times.

5.5 Prevention or slowing down of insecticide resistance development

5.5.1 Monitoring resistance

Monitoring of vector resistance to pesticides should be an integral component of the planning and evaluation of vector-bone disease and pest control programmes. The susceptibility of vectors should be ascertained before selection of an insecticide, and to provide baseline data for further

resistance monitoring. Such monitoring should be standardized to ensure the comparability of data from different sources. The use of standard test kits and procedures, including 'discriminating concentrations', is recommended.

Resistance management consists of preventing, or delaying as long as possible, the development of resistance to a pesticide, while at the same time maintaining an effective level of disease control.

5.5.2 Managing resistance

THE GOVERNMENT: Government should ensure that the following are considered in managing resistance and vector control with optimal cost–effectiveness:

a. Use of non-chemical control methods, either alone or as a supplementary measure, in the seasons or areas in which they are applicable and cost-effective;
b. Limitation of pesticide use to areas with high levels of disease transmission;
c. Use of adulticides, which kill only adult females, rather than larvicides, which kill both sexes, resulting in approximately half the selection pressure for resistance;
d. Rotation among unrelated insecticides according to a pre-arranged plan based on knowledge of the likelihood of resistance developing to each compound;
e. Choice of a compound that has been found by experience to select for a narrow spectrum of resistance rather than a broad one; and
f. Use of mixtures or mosaic treatments with unrelated compounds, so that individuals resistant to only one of the components are killed by the other. This principle is used routinely in therapy of tuberculosis, HIV infection and leprosy to avoid the induction of drug resistance and should be more thoroughly investigated for insecticides.

MINISTRY OF HEALTH & SANITATION: MoHS should ensure implementation of the following strategies

a. Promoting IVM
b. Training vector control staff
c. Promoting insecticide resistance monitoring and management
d. Restricting registration according to mode of action of pesticides
e. Reducing registration fees for insecticides with new modes of action
f. Developing a resistance management strategy, in collaboration with Ministry of Agriculture and other stakeholders.

5.6 Reducing risks of vector control for human health and the environment

Information dissemination and education on the importance of personal and communal contributions in the reduction of risks for spread of vector borne diseases shall be a major component of IVM implementation

MoHS should ensure implementation of the following strategies:

a. Promoting IVM
b. Raising awareness and community education and sensitization, for example on using ITNs/LNs, and improved hygiene and sanitation for all affected communities
c. Establishing pesticide risk reduction targets or schemes (voluntary)
d. Registering low-risk insecticides
e. Restrict moderate/high-risk insecticides in vector control
f. Establishing pesticide risk reduction targets or schemes (legally binding)
g. Subsidizing LLINs
h. Establishing IVM projects
i. Funding public research in biological control and environmental management

5.7 Reducing incidence of pesticide poisoning by household pesticides

The authority that approves use of a pesticide, including substitution of a new material for one already in use, must ensure that it is applied under appropriate supervision.

Training in the safe use of pesticides should be provided for medical specialists, entomologists, engineers, safety supervisors and other relevant practitioners on the mode of action of the pesticide. It should be provided for the purpose of diagnostic measures, recognition of the signs and symptoms of toxic effects, and the facilities required for treatment of cases of poisoning. Training in the safe use of pesticides should additionally be provided for field team leaders and other operators in relation to spraying techniques, safety precautions, protective equipment, recognition of early signs and symptoms of poisoning, and first-aid measures including resuscitation.

Government should put in place mechanisms to:

a. Raise awareness on risks of household pesticides
b. Create awareness on low-risk use of pesticides
c. Maintain register of low-risk household insecticides
d. Prescribe comprehensible pesticide labeling

e. Ensure public and private entities incorporate public education in their pesticide delivery services
f. Reduce registration fees and duty for low-risk pesticides as incentive to industry to bring low/risk products on the market
g. Ensure agreed percentage of revenue to be used for public education
h. Strengthen compliance monitoring and enforcement in supermarkets and retail shops

5.8 Improving pest and vector control services

5.8.1 Insecticide-treated nets

As most important malaria vector species tend to bite late at night, mosquito nets would be expected to protect against them effectively. Mosquitoes can, however, enter through holes in torn nets or can bite human skin in contact with the net. In order to avoid this problem, nets are treated with insecticides that are safe for humans in close contact.

Pyrethroids are the only insecticides currently recommended for treatment of mosquito nets. Long Lasting Insecticidal Nets have been a component of the malaria control strategy in Sierra Leone for the last 5 years targeting only children and pregnant women who are the most vulnerable to the disease. In 2008 however, the insecticide treated nets policy was revised to include the distribution of LLINs to the general population as opposed to the targeted delivery to only children and pregnant women.

5.8.2 Indoor residual spraying

In view of the general applicability of this method and the relatively well-established standardization of the application techniques and equipment, indoor residual spraying continues to be the most widely used method for malaria vector control. Indoor residual spraying increases the risks for a mosquito each time it enters a house for a blood meal, which it typically does every 2–3 days, so that few will survive the approximately 12 days that are required for malaria parasites to complete part of their life cycle in the vector mosquito.

5.8.3 Larviciding for Simulium damnosum

a. Target area: The insecticide is introduced into rivers and streams in several places. The number of application points should be determined from a preliminary survey and will vary by area and river according to the insecticide formulation used the breeding habits of the local vector and the characteristics of the watercourse, such as flow rate.

b. Insecticides: Suitable insecticides for Simulium control are available in the area covered by the Onchocerciasis Control Programme. The use of

LLINs is considered a suitable intervention in all epidemiological and under all socio-economic circumstances (urban and rural) in Sierra Leone.

i. The use of LLINs shall be implemented all over the country and be complemented by the application of indoor residual spraying (IRS).
ii. Distribution of LLINs in high transmission areas aims at contributing to fast reduction of the disease burden and sustaining the impact achieved by the application of IRS.
iii. In moderate transmission areas, LLINs are aimed at controlling disease transmission both in peak and low transmission seasons since one round of IRS shall be implemented targeting peak transmission in such areas.
iv. Train vector control staff.
v. Train private pest control operators.
vi. Establish certification scheme for vector control staff.
vii. Establish licensing scheme for private pest control operators.
viii. Establish association of private pest control operators.
ix. Elaborate technical guidelines.

5.9 Availability of sustainable funding for pesticide management

The government of Sierra Leone is highly committed to the sub-regional, regional and global approaches to prevent and control the spread of pests. The policy shall ensure broad-based and all-inclusive approaches that will include all stakeholders in its implementation.

a. Hence, Government agencies and institutions shall ensure increased collaboration in sourcing resources and technical assistance necessary for the implementation of support programmes throughout the country.
b. In accordance with the spirit and content of this policy, the government of Sierra Leone shall advocate for increased funding for implementation of application of agricultural and public health pest and vector control measures and support programmes.
c. Advocacy and awareness building for political commitment
d. Include cost/recovery mechanisms in pesticide legislation
e. Introduce import/sales taxes on pesticides
f. Allocate adequate human and financial resources

5.10 Avoidance of accumulation of obsolete pesticide stocks.

Sierra Leone needs to restrict the use of all banned POPs listed under the Stockholm Convention on Persistent Organic Pollutants (POPs).

Sierra Leone shall work with international communities to prevent the production and use of substances with POPs characteristics.

a. Sierra Leone should conform with Article 2.1 of the WTO's Technical Barrier to trade, which sets out that imported products shall be accorded treatment no less favourable than that accorded to products on national origin. To comply with the above, the import of pesticides shall be based on scientific risk assessments
b. Train vector control managers on pesticide needs assessments and procurement
c. Centralize pesticide procurement
d. Include provisions in tender documents for return of substandard pesticides by the supplier at their own cost

5.11 Availability of good quality pesticides

While public health pesticides are generally chosen to have a low hazard with respect to human health and the environment, all pesticides pose an inherent risk that should be reduced as much as possible.

a. Government is committed to abide by specifications developed by WHOPES for pesticides as part of the International Code of Conduct on the Distribution and Use of Pesticides for quality control and international trade
b. The government of Sierra Leone should ensure the establishment of a well equipped and accredited pesticide laboratory for quality and residue analysis.

5.12 Protection of biodiversity

Another key issue for pesticides is the effect they might have on biodiversity. Considering how prevalent the use of pesticides is in ecosystems, where endangered species are at risk, the MAFFS and MoHS, in collaboration with other relevant agencies, shall give explicit protection for such species.

The EPA should initiate a National Toxicity Monitoring Programme, which will monitor the levels of a number of pesticides in groundwater and surface water to ensure that water pollution from pesticides does not threaten compliance with the National Water quality. An effective approach to reducing pollution of water by pesticides would be to release fewer pesticides and/or less toxic pesticides into the environment and ground water.

The MAFFS and MoHS, through the regulatory system, shall place requirements or restrictions on users to limit the movement of pesticides to water sources. These will include institution of buffer zones, forbidding spraying in a certain proximity to water sources.

5.13 Food Safety

Efforts to maintain and enhance the safety of the nation's food supply are critical as established in the National Food Safety Law (NFSL).

The NFSL regulations should make provision to establish maximum limits for pesticide residues that may be present in food stuffs to ensure that food is safe to eat. To regulate the safety of food, the MAFFS and MoHS regulatory systems shall ensure that pesticides are properly labeled. To ensure compliance with NFSL, monitoring of residues on food is important and should be implemented.

5.14 Workers Protection

Government shall promulgate an Occupational Health and Safety Act (OHSA) to regulate health and safety at the workplace for all workers. This Act places the onus on employers to maintain a safe work place. The regulation shall make provision for various mandatory safety measures to protect the health of workers handling hazardous chemicals, such as risk assessment, safety training, safe practices and medical, biological and environmental monitoring of all work places.

The MAFFS and MoHS shall, in accordance with OHSA Act, engage employers and employees to raise awareness, and set up educational and training programmes appropriate to the public and users.

Training and information programmes should include all sectors handling and using pesticides. Aside from farmers, pesticide retail store-owners and Labourers, extension workers, DAOs/Directors/Deputies, pest control operators, and even medical doctors, environmental health officers, nurses and paramedics should also be trained on the safe use and handling of pesticides, and the disposal of pesticide containers and unused pesticides.

The MAFFS and MoHS shall require that any person applying and selling pesticides must be certified in order to apply or sell pesticides.

6.0 COMPLIANCE WITH THE ROTTERDAM CONVENTION ON THE PRIOR INFORMED CONSENT (PIC) PROCEDURE FOR CERTAIN HAZARDOUS CHEMICALS AND PESTICIDES IN INTERNATIONAL TRADE

The Rotterdam Convention on Prior Informed Consent (PIC) for certain hazardous industrial chemicals and pesticides oblige an exporter of such chemicals to obtain consent of the receiving country before delivery. This

international instrument addresses the international trade of pesticides; it is developed to protect human health and the environment from the potential harmful effects of certain hazardous pesticides. Sierra Leone shall sign to this convention and comply with the procedure that international shipment of pesticides that are banned or severely restricted to protect human health or the environment should not proceed without the agreement, or contrary to the decision, of the participating country. This supports the notion that the ban or restrictions of highly toxic pesticides should go along with the promotion of crop protection alternatives to the users.

7.0 COMPLIANCE WITH THE STOCKHOLM CONVENTION ON PERSISTENT ORGANIC POLLUTANTS (POPS)

Sierra Leone shall restrict the use of all banned POPs listed under this Convention. Sierra Leone shall work with international communities to prevent the production and use of substances with POPs characteristics.

8.0 CONFORMITY WITH INTERNATIONAL OBLIGATIONS UNDER THE WORLD TRADE ORGANIZATION (WTO):

8.1 Conformity

Sierra Leone should conform with Article 2.1 of the WTO's Technical Barrier to trade, which sets out that imported products shall be accorded treatment no less favourable than that accorded to products on national origin. To comply with the above, the import of pesticides shall be based on scientific risk assessments.

8.2 Labeling

The MAFFS and MoHS shall ensure that pesticides are properly labeled to ensure that information necessary to ensure their safe use is prominently displayed. Information should be presented in such a way that it enables a person to understand the risks and develop a sense of proportion in order to make a judgment on the acceptability of those risks. The Policy on Labeling would be consistent with the new Globally Harmonized System (GHS) of classification and labeling of chemicals.

8.3 Pesticide disposal and container management

The environmentally sound disposal of expired and unwanted pesticides poses a significant challenge to producers of agricultural products and other pesticide users, as a result of its high cost. The proper disposal of waste pesticides eliminates a potential threat to health and the environment. Sierra Leone is yet to become a signatory of the Basel Convention on the Control

of Trans - boundary Movements of Hazardous Wastes and their Disposal. The Convention's main objectives are as follows:

a. To ensure that the generation of hazardous waste is reduced to a minimum;
b. To dispose as much as possible, hazardous wastes within the country of their generation;
c. To establish enhanced controls on exports and imports of hazardous waste;
d. To prohibit the shipment of hazardous wastes to countries that lack the legal, administrative and technical capacity to manage and dispose of them in an environmentally sound manner; and
e. To cooperate on the exchange of information, transfer of technology, and the harmonization of standards, codes and guidelines.

Whiles the Government is working on signing in to Basel convention, MAFFS and MoHS must institute programmes to collect old, out-of-date or otherwise unusable pesticides to avoid the build-up of obsolete pesticide used by farmers and other users. The programmes should also be expanded to include recovery and recycling of pesticide containers.

8.4 Support for alternative product and/or methods

The Policy proposes that the Government should support the availability and adoption of sustainable pest management tools and practices in agriculture and health. This will include the following:

a. Help address farmers' needs in achieving effective and sustainable pest management;
b. Develop and implement strategies to reduce environmental and health risks from pesticides;
c. Support research to develop and improve pest management tools;
d. Facilitate the registration of reduced-risk pesticide adoption, and
e. Support the development of and provide information on the best Integrated Pest Management and Organic Production.

To ensure transparency and access to information, the MAFFS and MoHS shall incorporate all aspects of the regulatory system and also give opportunity to the public for involvement in the development of new aspects of the regulatory decision in the legislation. Information must be presented in such a way that it enables a person to understand the risks and develop a sense of proportion in order to make a judgment on the acceptability of those risks.

To provide Sierra Leoneans with the opportunity to provide inputs into requirements, processes and policies for assessing pesticide risk and efficacy, regulatory proposals and consultation documents will be made available publicly.

9.0 LEGISLATION

Legislation is needed for the regulation of pesticides that will strengthen health and environmental protection.

9.1 Special protection

MAFFS and MoHS should introduce special protection for vulnerable populations like children, women, disabled, etc. by:

a. Prohibiting registration of pesticides that pose unacceptable risk to people's health or the environment;
b. Expediting the registration of lower-risk pesticides;
c. Taking into account pesticide exposure from all sources, including, food and water;
d. Considering cumulative effects of pesticides that act in the same way;
e. Supporting sustainable pest management;

9.2 Mandatory disclosure of hazardous pesticides

MAFFS and MoHS should make the registration system more transparent and participatory by the public by establishing a public register containing information about permits applications. The legislation will establish conditions that will allow for pre and post-decision access to health, safety and environmental data. The conditions will include provisions that will ensure confidential business information

MAFFS and MoHS, in collaboration with the EPA, must strengthen post-registration control of pesticides by:

a. Requiring pesticide companies to report adverse effects;
b. Requiring pesticide companies to report sales data;
c. Requiring re-evaluation of older pesticide or special reviews of registered pesticides;
d. Providing a comprehensive compliance strategy, with appropriate enforcement provisions.

10.0 INSTITUTIONAL ARRANGEMENTS

10.1 Pesticide Regulation Units

MAFFS and MoHS should have statutory mandate to regulate agricultural, public health, household, and all other pesticides. The relevant units in each Ministry will:

a. Review applications for registration of pesticides;
b. Conduct science-based health, environmental and efficacy assessments;
c. Develop and implements policies and guidelines related to pesticide management;
d. Promote sustainable development;
e. Enforce compliance with the legislation, and disseminate information on pesticide management issues.

10.2 Inter-departmental cooperation

The policy recognizes that effective and efficient management of pesticides is a concerted effort that requires inter-departmental coordination from a range of team players. The responsibility for the enforcement of pesticide regulation will be shared among various relevant ministries and agencies with the MAFFS and MoHS having the statutory responsibility.

Recognizing that these departments will have complementary responsibilities, the MAFFS and MoHS and the various ministries and agencies will develop inter-departmental Memorandum of Understanding (MoU) in relation to pesticide management issues. These MoUs are intended to foster a strong working relationship between the parties by delineating their respective responsibilities and identifying areas of mutual interest, and to avoid duplication of efforts.

11.0 MONITORING AND RESEARCH

Many pesticides are known to accumulate in the environment and to have detrimental effects on human health and the environment. Long-term monitoring programmes and targeted research are essential in order to evaluate these impacts. Without adequate and reliable data, it would be impossible for the Government to assure Sierra Leoneans that pesticides in current use are not posing such a risk to wildlife and people.

Government recognizes that effective regulations are based on good science, and that strong ties are needed between research/monitoring and regulation. Research and monitoring will help to identify changes in pesticide pollution, danger spots, and particularly problematic pesticides. Furthermore, effectiveness of interventions and their impact on disease

transmission and burden shall be monitored through active surveillance of prevalence of the diseases among children and the general population on a regular basis.

12.0 IMPLEMENTATION

Local responses to the management of pesticides in public health, agriculture and environment sectors are often poor. Coordination and collaboration may not be sufficiently effective between the principal pesticide regulatory authority that is the Ministry of Agriculture and the Ministry of Health, on the evaluation, authorization, monitoring and control of public health pesticides. As a result, not all elements of the pesticide life cycle may be properly regulated and managed.

A lack of adequate coordination tends to be observed between government and other stakeholders, such as the private sector, (manufacturers, importers, retailers, and pest control operators), civil society, and academia and research institutes. Consequently, problems in pesticide management that could have been recognized and dealt with at an early stage are either overlooked or only materialize in the legislation or enforcement phase. A particular example is the development of insecticide resistance in public health applications which is caused or exacerbated by use of insecticides with the same mode of action in agriculture. The prevention and management of such resistance selection requires routine monitoring of insecticide resistance as well as joint development of a strategy for resistance management between the Ministries of Health and Agriculture.

For effective implementation of this policy, and for the development of strategies and programmes, there must be a designated national competent authority responsible for performing the administrative and technical functions required for this purpose.

There must be a designated Government Ministry which has portfolio responsibility for implementation and coordination of the functions and powers assumed by the Government of Sierra Leone.

13.0 ADVISORY BODIES

This policy considers it necessary to form advisory bodies for the Pesticide Regulation Unit, the advisory bodies will advice on policies and issues relating to the regulatory system and to monitor the system for efficiency and performance.

ANNEX: WHO CLASS 1A AND 1B HAZARDOUS PESTICIDES

Annex 1:

WHO Class 1a: "Extremely Hazardous"

1. Acrolein,
2. Aldicarb
3. Arsenous
4. Brodifacoum
5. Bromadiolone
6. Bromethalin
7. Calcium
8. Captafol
9. Chlorfenvinphos
10. Chlormephos
11. Chlorophacinone
12. Chlorthiophos
13. Coumaphos
14. Crimidine
15. Cycloheximide
16. Demephion-o
17. Demephion-s
18. Demeton-o
19. Demeton-s
20. Dibromochloropropane
21. Difenacoum
22. Difethialone
23. Dimefox
24. Diphacinone
25. Disulfoton
26. Epn
27. Ethoprophos
28. Fenamiphos
29. Fensulfothion
30. Flocoumafen
31. Fonofos

32. Fosthietan
33. Hexachlorobenzene
34. Leptophos
35. Mephosfolan
36. Mercuric
37. Mevinphos
38. Parathion
39. Parathion
40. Phenylmercury
41. Phorate
42. Phosfolan
43. Phosphamidon
44. Prothoate
45. Schradan
46. Scilliroside
47. Sodium
48. Sulfotep
49. Tepp
50. Terbufos
51. Thionazin
52. Trichloranat.

Annex 2:

WHO Class 1b: "Highly Hazardous"

1. 3-chloro-1,2
2. Propanediol
3. Aldoxycarb
4. Aldrin
5. Allyl Alcohol
6. Aminocarb
7. Antu
8. Azinphos Ethyl
9. Azinphos Methyl
10. Benfuracarb
11. Blasticidin-s
12. Bromphos Ethyl
13. Butocarboxim
14. Butoxycarboxim
15. Cadusafos
16. Calcium Arsenate
17. Carbofuran
18. Carbophenothion
19. Cloethocarb
20. Coumachlor
21. Coumatetralyl
22. Crotoxyphos
23. Demeton-s Methyl
24. Demeton-s Methylsulphon
25. Dichlorvos
26. Dicrotophos
27. Dieldrin
28. Dimetilan
29. Dinoseb
30. Dinoseb Acetate
31. Dinoterb
32. Dioxathion
33. Dnoc
34. Edifenphos
35. Endrin
36. Esp
37. Famphur
38. Fenthion
39. Flucythrinate
40. Flouroacetamide
41. Formetanate

42. Fosmethilan
43. Furathiocarb
44. Heptenophos
45. Isazophos
46. Isofenphos
47. Isoxathion
48. Lead Arsenate
49. Mecarbam
50. Mercuric Oxide
51. Methamidophos
52. Methidathion
53. Methomyl
54. Monocrotophos
55. Nicotine
56. Nitralicarb
57. Omethoate
58. Oxamyl
59. Oxydemeton Methyl
60. Paris Green
61. Pentachlorophenol
62. Phenylmercury Nitrate
63. Pirimiphos Ethyl
64. Propaphos
65. Propetamphos
66. Sodium Arsenite
67. Sodium Cyanide
68. Strychnine
69. Tefluthrin
70. Thallium Sulfate
71. Thiofanox
72. Thiometon
73. Triamiphos
74. Triazophos
75. Tributyltin Oxide
76. Vamidothion
77. Warfarin
78. Zeta Cypermethrin
79. Zinc Phosphide