NATIONAL PROFILE
OF
CHEMICALS MANAGEMENT INFRASTRUCTURE
IN
KIRIBATI

Environment & Conservation Division

Ministry of Environment, Lands & Agriculture Development

Republic of Kiribati

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EXECUTIVE SUMMARY

INTRODUCTION

This project of updating of the National Chemical Profile for Kiribati is a series of global efforts in achieving the goal of "Agenda 21" on "Environmentally Sound Management of Toxic Chemicals". This Profile was developed under the guidance of UNITAR and in close consultation with national stakeholders.

The Chemical Profile reports on the current state of chemicals including pesticides, industrial, and consumer chemicals. The Profile consists of chemicals inventory and information on production, import, export and use; ministries and agencies managing chemicals, issues contributing to health and environmental problems at various stages of their life-cycle, and priority concerns identified. Existing legal and non-legal mechanisms for chemical management, co-coordinating mechanisms, data access and use, technical infrastructure, international linkages, awareness and understanding of workers and the public, and resources available for chemicals management are also reported.

The Profile contributes to a better understanding of problems or potential problems related to chemicals that exist in Kiribati and mechanisms that are available to address these issues. The Profile identified gaps or weaknesses in the existing systems, and established priorities for future activities for improving chemical management at the national level.

CHEMICAL PRODUCTION, IMPORT, EXPORT AND USE

Chemicals in Kiribati are used for domestic applications, educational purposes, agricultural, industrial, and consumer uses. Chemicals are not manufactured in Kiribati but mostly imported for uses in various industries including for further processing into consumer and exportable products. Types of chemical wastes generated include petroleum products waste, obsolete chemicals including pesticides, fertilisers, pharmaceuticals, school chemicals, and other consumer chemicals.

PRIORITY CONCERNS RELATED TO CHEMICAL PRODUCTION, IMPORT, EXPORT AND USE

Current priority concerns related to chemicals in Kiribati particularly for Tarawa and Banaba are for the following chemical pollutants:

- Asbestos – the uncontained nature of asbestos in buildings materials and remains of construction materials surrounding residential areas on the island of Banaba are posing health risks from prolonged exposure
- Bitumen containing PAH and Heavy Chain Hydrocarbons – at Bonriki airstrip area are contaminating the nearby shore platform, sea water, marine animals, and groundwater

that is encroaching to residential areas, and with potential risks in contamination of the fresh groundwater reserve

- Mercury, dioxins, furans, particulate matter, infectious medical waste, and odour – resulting from the deteriorated state of the TCH hospital main incinerator, disposal of toxic chemicals such as through mercury thermometers, and the lack of waste sorting from infectious and non-infectious waste materials
- Hydrocarbons and Odour – resulting from petroleum leakages permeating the ground and contaminating the groundwater at KOIL and PUB premises and affecting groundwater of nearby residents
- Hazardous, toxic, and obsolete chemicals at the Agriculture department - pesticides including the poisonous copper arsenate, fertilisers, animal pharmaceuticals and other agricultural chemicals including unused metal-based salts and unlabelled chemicals, which are stored at Agriculture's storeroom
- Hazardous and toxic chemicals at the MHMS: silver in x-ray films; xylene solution, cyanide complexes, phenol, uranyl acetate, and o-toluidine, in the pathology laboratory; and obsolete pharmaceuticals including antibiotics in pharmaceutical stores
- Hazardous and toxic chemicals at schools: mercury, dichromate, organic solvents (chlorophenol and chloroform), and metal-base salts that are not suitable for stabilisation including mercury sulphate and ammonium thiocyanate.

LEGAL INSTRUMENTS AND NON-REGULATORY MECHANISMS FOR MANAGING CHEMICALS

Chemicals management from import, through to use and export, is a cross-sectoral matter, and relevant legislation, regulations, or standards in the country often exist separately. The laws commonly aim to protect Kiribati' environment and her population by controlling and regulating the importation, manufacture, sale, distribution, use, export, and other movements of chemicals including those that are dangerous and may cause harm.

The key legal instruments for regulating chemicals particularly of hazardous and toxic nature include the

- Environment Act No. 9 of 1999 (and amendment)
- Chemical Weapons (Prohibition) Act No. 2 of 2006
- Pharmacy & Poisons Ordinance CAP. 70
- Dangerous Drugs CAP. 23
- Petroleum Ordinance
- Shipping Ordinance. CAP. 93
- Merchant Shipping Oil Pollution Gilbert Islands Order 1975
- Nuclear Installation Act of 1965
- Customs Act of 2004

All Bills and Legislations are made publicly known in the process of Parliament hearings, and legislations are made available within the records of the laws of Kiribati preserved at the Attorney General's Office, and can be accessed by the public.

Several non-regulatory mechanisms for managing chemicals include:

- The levy of tax on imported items which includes chemicals under the Customs legislation
- Awareness and voluntary campaigns e.g. during world environment days, community clean-ups, and community workshops
- Enabling Technical Assistance programmes under broader global/regional chemical-related programmes
- Supplementary programmes provided by non-government and community-based organisations.

MINISTRIES, AGENCIES AND OTHER INSTITUTIONS MANAGING CHEMICALS

The management of a chemical throughout its life-cycle is normally handled by several ministries, agencies, and other institutions. Government ministries and agencies responsible for most of the stages of a chemical's life-cycle (i.e. importation, storage, transportation, distribution, use and handling, and disposal) are mainly MHMS, Agriculture department, MWE, and the Private sector. The MEYS is involved only in the importation, storage, use, and disposal of chemicals; MICT mainly for the transportation and distribution, and the MFED (including KCS) for the importation, storage, and disposal of chemicals particularly obsolete and unclaimed chemical consignments.

The MLHRD and MHMS are jointly responsible for occupational health and safety related to chemical hazards in the workplace. MELAD through ECD has the key responsibility for regulation and protection of the environment from activities using chemical substances that pose potential risks to the environment and human health. The national Parliament and the Attorney General's Office are responsible for legislation, and the Office of *Te Beretitenti* is responsible for enforcing the control of all stages of the chemical's life cycle. Resources for chemical management are currently insufficient and needs to be improved for most of the stages of chemicals life-cycle used in Kiribati.

Prevention of overlapping of mandates among ministries and bodies and the potential for duplication of activities and efforts are clearly addressed through the Kiribati Development Plan (KDP), outlining Lead and Supporting Ministries for Government's key policy areas.

RELEVANT ACTIVITIES OF INDUSTRY, PUBLIC INTEREST GROUPS AND THE RESEARCH SECTOR

Industrial organisations, research institutes, and non-governmental organisations (NGOs) play an important role in the management of chemicals through their programmes which normally supports Government's efforts particularly throughout the community or civil society. However, there are no current specific chemical related activities that are being implemented with NGOs. Government owned main industries which includes KOIL and the Kiribati Copra Mill Company

Ltd (KCMCL) are involved markedly in the import, sales/marketing, transport, storage and disposal of chemicals or chemical-related products.

Educational institutions, industries, and NGOs are able to provide some expertise outside Government mainly on data collection, risk reduction, training and education, research on alternatives, monitoring, and providing of information to the public. There is very limited expertise in country for chemical testing, risk assessment, policy analysis, and for chemical related research, hence external expertise and services were normally sought to meet these requirements.

Government's key policies, broad strategies, and some relevant laws allow opportunities for participation of non-government organisations. These are enabled through joining of multi-stakeholder national committees by NGOs.

INTER-MINISTERIAL COMMISSIONS AND COORDINATING MECHANISMS

An effective management of chemicals requires cooperation and coordination of efforts among ministries, agencies and other relevant government and non-governmental bodies. The main coordinating mechanisms currently employed by ministries, agencies, and institutions are through national coordinating committees (such as NCMC) and working committees. An NCMC or other sub-committees provides a platform for NGOs to share information, participate in planning, decision-making and in the implementation of national chemicals management programmes and policies.

MELAD's Environment & Conservation Division has been the main coordinating body for chemicals management including for the facilitation of information sharing across sectors.
Coordination, however, of inter-ministerial commissions through existing mechanisms has proved to be difficult and costly.

DATA ACCESS AND USE

Availability of data and information are crucial to facilitate decision making processes often required for the effective management of chemicals. However, very limited data and information are available for most aspects of chemical management such as risk assessments of activities relating to chemical use, licensing, accidental preparedness/response, and auditing.

National data including statistics on production, import/export, transport accidents, poisoning, register of pesticides and toxic chemicals are located separately across relevant ministries. Government Officers and the general public have access to national data and information.

There is no specific law to date providing for the collection and dissemination of national and local data. There are however, fragmented legal provisions in some laws such as in the Environment (Amendment) Act 2007 requiring the keeping of a public register of applications

and licenses issued. Nevertheless, data requested within Government and by the general public are readily provided to Kiribati citizens.

Access to international literature and databases is important to facilitate increase in availability of information resources and for their dissemination for the effective management of chemicals. Some published international literatures are available in relevant ministries and agencies such as environmental health documents, environmental and chemical information, and decision documents for Pacific Island countries.

International databases are not stationed in Kiribati; however, some access to global networks may be possible only through authorised Government officials whose work has direct relevance to Kiribati's reporting obligation under international agreements.

The exchange of national information among various ministries and other institutions and concerned parties is encouraged through forums such as national and project committees. Other mechanisms employed in information exchange include the use of electronic mail, newsletters, and Government circulars. Information collection and exchange however, has not always been efficient and can become a costly process.

TECHNICAL INFRASTRUCTURE

Availability of technical infrastructure is important for the effective management of chemicals. Chapter 3 and Annex 2 identified priority chemical issues and concerns and associated degraded states of infrastructure such as the hospital incinerator causing more environmental and health problems and thus needs urgent attention.

Laboratory infrastructures in Kiribati are limited mainly for health and educational purposes. Environmental testing laboratories are non-existent and, health and educational laboratories currently do not have the capacity to carry out complex chemical analysis required for more comprehensive environmental assessments.

Existing cooperation programmes between Kiribati and regional countries have enabled assistance in the sharing of laboratory facilities and conducting of chemical analyses that cannot be done in country. At this stage, national relevant programmes do not exist for the purpose of improving the quality and quantity of the laboratories, and there is also no existing plan for establishment of an environmental testing laboratory. Technical expertise required to implement government policies and programmes related to chemical management is also limited in Kiribati.

INTERNATIONAL LINKAGES

Kiribati is a party to a number of international treaties, conventions, and agreements that are beneficial to the country and its people. Kiribati is actively involved in forums such as

those concerned with the management of chemicals, and is adopting opportunities for an integrated approach at the national level. Although as a small island state with limited resources, there are difficulties in fulfilling responsibilities under international agreements. At the national level, the Government has re-allocated financial, human, and other resources; restructured some institutions, introduced new laws, and have begun to mainstream some global programmes into Government's policies and national programmes. However, areas particularly on chemicals management still require improvement.

The most recent relevant technical assistance for chemicals management is through the 'Strategic Approach to International Chemicals Management' (SAICM) programmes, funded by UNITAR in collaboration with IOMC, and implemented by MELAD. The SAICM enabling project provides for the updating of the national chemical profile and identifies capacity needs for the sound management of chemicals in Kiribati. Several programmes relevant for chemicals management and environmental sustainability exist within MELAD and other relevant ministries.

The common constraints in relation to implementing international agreements are the inadequacy of financial support, the limited number of qualified persons in the country to effectively implement chemical management activities, problems with communication systems, transportation, and inadequate participation by key stakeholders due to over commitments of their time.

There is a need for international organisations, aid agencies', and Government commitment to provide for the improvement in programme planning with more local participation, administrative and technical support during project implementation, maintaining of a reliable communication system, providing of more incentives, and providing of means for programme sustainability.

AWARENESS/UNDERSTANDING OF WORKERS AND THE PUBLIC

Awareness activities on potential risks, safety, and other aspects associated with chemicals is an important component of chemicals management. Information to workers and to the public in relation to the potential risks associated with a chemical's life cycle (production, import, export, handling, use and disposal) is provided mainly through legal instruments, chemical-related programmes, policies and other relevant activities of government, institutions, and non-government organisations.

Relevant Government policies that promote the increase of awareness and understanding of chemicals risks and management include:

- the development of knowledge and skills by raising the standards and quality of education in the science and engineering based subjects addressing chemicals information and applications; and
- minimising and controlling waste and pollution by increasing public awareness on proper waste disposal and reducing pollution;

Other policies relevant for promoting awareness of chemicals risks and management are captured in laws which include the Environment Act, Merchant Shipping Oil Pollution Gilbert Islands Order, Petroleum Ordinance, and the Customs Act.

Workers obtain relevant chemical information through participation in appropriate trainings normally conveyed within ministries, companies, or educational institutions. Government's national public awareness campaigns also provide for information dissemination to the general public. Non-government organisations through their community environmental and waste management education programmes have also been actively involved in raising workers and public awareness on a range of environmental issues including chemical hazards and pollution.

RESOURCES AVAILABLE AND NEEDED FOR CHEMICALS MANAGEMENT

Availability of resources in terms of human and financial, are fundamental to the effective implementation of activities related to chemicals management. Resource availability is inadequate within Government ministries, agencies and other institutions with roles in chemical management.

Resources and expertise required to fulfill responsibilities for chemicals management was estimated and include the requirement of professional staff in the following Ministries and Divisions:

- Environment Division - for hazardous and toxic waste management and disposal; and the monitoring, sample collection and analyses, collection of chemical pollution data, and capability in the implementation of enforcement measures
- Health Ministry – for devising of a waste management plan; hazardous, toxic, infectious, and obsolete chemicals sorting and disposal, maintenance of incinerator; and monitoring of chemicals for adverse effects on health
- Agriculture Division – for knowledge of pesticides and toxic chemicals involved; storage and disposal of obsolete pesticides, safe application of pesticides, and follow up activities on possible adverse effects on the environment and human health.

The various Government ministries and agencies that have responsibilities related to chemicals management are not sufficient to effectively undertake all responsibilities that they are charged with including for meeting of requirements of international agreements. Qualified human resources in ministries and agencies, for the safe management of chemicals, including technicians, legal experts, customs officers, environmental and health inspectors, chemical waste experts, and occupational health and safety officers, can therefore be assessed as deficient.

CONCLUSION & RECOMMENDATIONS

Kiribati has progressed much to this stage in fulfilling her obligations under international chemical and related agreements. This can be seen in the increased number of achievements related to chemical management compared to previous years which includes the introduction and amendment of relevant laws and more rigorous technical assistance following up outstanding chemical issues.

The adverse effects of chemical wastes were already threatening environmentally, culturally, and economically significant and limited resources vital for the survival of the population. This

chemical profile provides important chemical information important for understanding of issues and potential problems necessary for the effective management of chemicals in Kiribati. Although not all data were able to be obtained fully at this stage, this report was able to present more updated data and information, reinforce priority issues identified in recent studies, and identify policy, institutional and legislative gaps that needs attention for strengthening and improving the management of chemicals.

This report highlights the following recommendations for improving chemical management:

- the need for political will and support through ongoing commitment of resources for the sound management of chemicals in Kiribati.
- the need for institutional capacity development and strengthening to effectively carry out responsibilities related to chemical management including the enforcement of relevant laws that affect chemicals management
- develop and strengthen technical expertise particularly in the science disciplines (chemistry, toxicology, environmental sciences, and environmental engineering), and also in related management aspects.
- the need to improve chemical infrastructure for priority issues and concerns identified in the recent study (Annex 2), and for environmental analysis purposes to support monitoring and data generation required for improving chemical management and protection of the environment and human health
- to strengthen and improve chemical related data generation, and information management across sectors; to establish a centralised information system, and to encourage the sharing of data and information amongst the NCMC and other key stakeholders
- to increase awareness and training activities related to chemicals and their management across sectors, key stakeholders, and the wider community
- that relevant and responsible ministries are encouraged to take initiative in putting in place appropriate policies and regulatory regimes necessary for improving the management of chemicals
- the need for more follow up studies and technical assistance to be undertaken to provide science-based rationale for priority setting
- to translate Government's key policy areas and broad strategies for development into effective tangible action plans and to integrate elements of chemical management
- to develop an appropriate information law to provide for the collection, dissemination, and management of local and national data and information
- to encourage more participation of private organisations in the planning and implementation of Government's development plan including those related to chemical management activities
- to improve implementation of international chemical related agreements by mainstreaming international programme activities into national sector policies and programmes, and for donors/international agencies to increase support for implementation at the national level.

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ACRONYMS

AMAK	Aia Maea Ainen Kiribati
FAO	Food and Agriculture Organisation of the United Nations
FSP	Foundation of the People of the South Pacific
GC-MS	Gas Chromatograph-Mass Spectrometer
ILO	International Labour Organisation
HPLC	High Performance Liquid Chromatography
ICP-MS	Inductively Coupled Plasma-Mass Spectrometer
ICP-OES	Inductively Coupled Plasma-Optical Emission Spectrometer
IOMC	Inter-Organisation Programme for the Sound Management of Chemicals
KANGO	Kiribati Association of Non-Government Organisations
KCMCL	Kiribati Copra Mill Company Ltd
KGV/EBS	King George V & Elaine Bernacchi School
KOIL	Kiribati Oil Company Ltd
KTI	Kiribati Technical Institute
MCIC	Ministry of Commerce, Industry, and Cooperatives
MICT	Ministry of Information, Communication, and Transport
MELAD	Ministry of Environment, Lands & Agriculture Development
MEYS	Ministry of Education, Youth & Sports
MFA	Ministry of Foreign Affairs
MFED	Ministry of Finance & Economic Development
MHMS	Ministry of Health & Medical Services
MLHRD	Ministry of Labour and Human Resources Development

NCC	National Coordinating Committee
NCMC	National Chemical Management Committee
NGO	Non-Government Organisation
OECD	Organisation for Economic Co-operation and Development
POPs	Persistent Organic Pollutants
PUB	Public Utilities Board
SAICM	Strategic Approach to International Chemicals Management
SPREP	Secretariat of the Pacific Regional Environment Programme
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organisation
UNITAR	United Nations Institute for Training and Research
USP	University of the South Pacific
WHO	World Health Organisation

CHAPTER 1

NATIONAL BACKGROUND INFORMATION

1.1. INTRODUCTION

Chapter 1 provides the general background information on Kiribati both at the national and the regional level. The physical, demographic, and political context of Kiribati are described. The two sectors of the economy, the industrial and agricultural sectors, are described and summarised.

1.2. PHYSICAL AND DEMOGRAPHIC CONTEXT

The Republic of Kiribati is an archipelago composed of a strain of 33 island atolls scattered in a vast Exclusive Economic Zone (EEZ) of 3.55 million km^2 in the central Pacific Ocean. The islands are divided into three main groups: the Gilbert (west), Line (north east), and Phoenix (in the south east). Total land area is 820 km^2 while the ocean has 3.5 million km^2. The islands are located where the 180th Meridian crosses the Equator and extends to 4 degrees north and south of the Equator. The geographic spread reaches 4,000 km from east to west and 2,000 km from north to south.

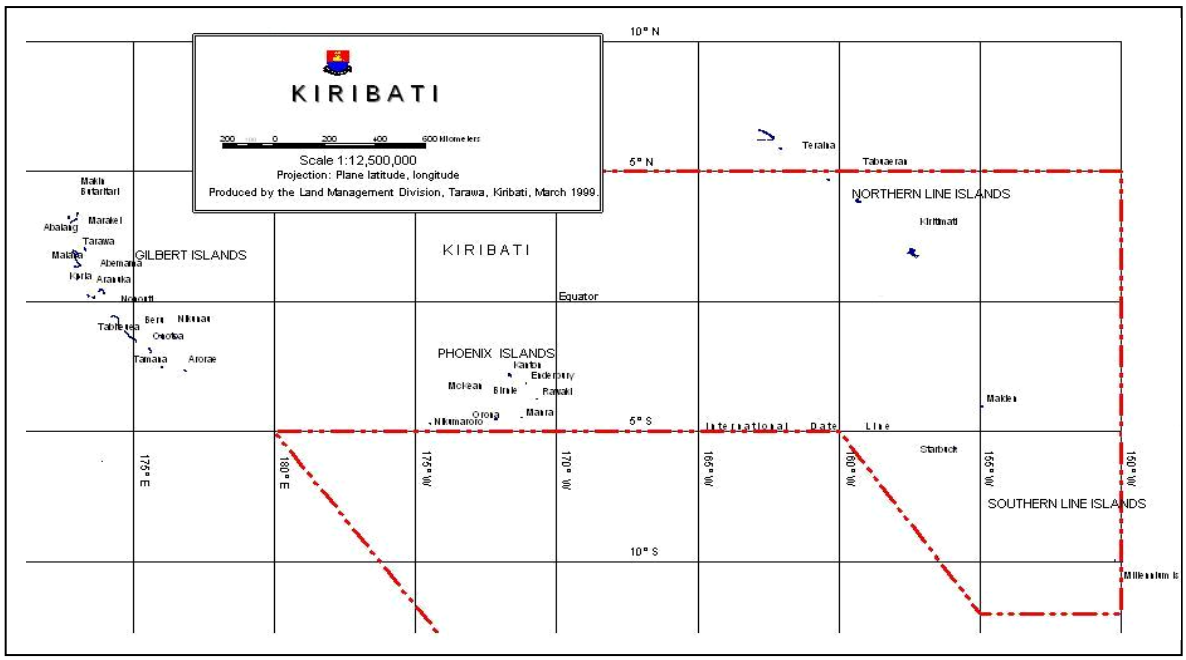

Figure 1.1: The vast ocean zone and the geographical distribution of the islands makes it challenging for the effective management of chemicals and environmental protection.

Climate is tropical with a temperature averaging at 30 degrees Celsius. The humidity is high and there is a high and ferocious salinity in the atmosphere. The water table is thin and brackish.

Economic indicator includes a GDP per capita (average 2005-2008) of AUD$961.00 and a GNP per capita (average 2005-2008) of AUD$1,670 (National Statistics Office, 2008). Kiribati falls under the UN category of Least Developed Countries (LDCs) due to its low per capita GDP, limited human resources, and high vulnerability to external forces.

The population of Kiribati was counted at 92, 533 (2005 Census). Of this total, 44 % resides on the capital, urban and main commercial centre, of South Tarawa. Of the population of 15 years and over (84 %), 28 % attained secondary school while only 3 % were graduates. Of the population of 10 years and over, about 41 % were smokers, about 20 % drink alcohol, and 14 % drink Kava, showing dependency of chemical related products and the health risks associated.

Official languages are I-Kiribati and English, however, the I-Kiribati language is predominantly spoken nation-wide. Other languages including Tuvaluan, Chinese, Japanese, and German are spoken by a few particularly expatriates and those residing in Kiribati.

About 14 % of the total population of 15 years and over was involved in either formal or non-formal employment. The agriculture and fisheries sector (includes copra cutters, seaweed farmers, and fishermen) made up 7 %; trade workers (includes carpenters, vehicle mechanics, printer workers, food preparers, and tailors) comprised 8 %; plant and machine operators (includes vehicle and electrical power operators), and professionals (includes teachers, engineers, and pharmacists). The main local staple food includes breadfruit grown in 60 % of households, and ‘babai’ grown in 51 % households. Traditional farming and fishing plays a very important role in the life of the Kiribati people.

1.3. POLITICAL/GEOGRAPHIC STRUCTURE OF THE COUNTRY

Kiribati adopts a form of government where the *Beretitenti* (President) is both Head of Government and Head of State. The *Maneaba ni Maungatabu* is the Legislature (law-making body) while the Cabinet is an Executive body. Implementation of government policies through administrative and management functions are executed by government ministries where appointed Ministers play a leading role and ensure that government policies are implemented accordingly.

The Ministry of Internal and Social Affairs (MISA) is charged with local government services on outer islands (other than South Tarawa, Line and Phoenix groups) and also urban centres through Local Councils. The placement of Local Councils on outer islands provides a mechanism for decentralising administrative activities and services including the facilitation of decision-making needed for the community in the outer islands.

1.4. INDUSTRIAL AND AGRICULTURAL SECTORS

Limited land mass, the atoll make up of the islands, and their geographical isolation, render Kiribati as disadvantaged in the scale of her natural resources, biodiversity, and efficient access to world markets. Industrial and agricultural activities are rather limited with the main large ones existing only as Government owned companies. However, Kiribati benefits largely from the marine sector that utilises the vast EEZ of 3.55 million km^2 through the issuing of fishing licenses to foreign vessels, marine resources and products trade including export, and from other fishing enterprises.

Major groups of occupation for the population of 15 years and over (2005 census) include: Agriculture and Fisheries (7 %), Manufacturing (2 %), Electricity (2%), Construction, (4 %) Wholesale and Retail Trades (13 %), Hospitality (Hotels and Motels) (1.7 %), Transport (Land, Sea and Air) and Communication (11 %), Financial Services (3 %), and Public Administration (52 %).

The following tables provide further breakdown of data for the Industrial and Agricultural sectors. Most numbers were estimates only but close to actual data (for example, employees in the Agricultural Division comprising the agricultural sector were estimated from the total of the whole Ministry of Environment, Lands & Agriculture Development (MELAD).

Table 1.A: Overview of the Industrial and Agricultural Sectors

Sector	Contribution to the Gross Domestic Product (%) (2008)	Number of Employees	Major Products in each Sector
Industrial/Manufacturing Sector	56 %	2,218	Boats, carpentry products, garments, food (by catering services and general outlets)
Agricultural Sector	5 %	936	Copra, vegetable and livestock
TOTAL	61 %	3, 154	

With the current structure of the agricultural sector, it is difficult to classify the size of farms at this stage since farming in Kiribati consists of coconut plantations which cover most of the islands while other smaller-scale farming activities can be segmented across different parts of the islands but on land owned by the same person or family.

The breakdown of agricultural production and industrial production by region (such as total value of crops, total value of industrial production, number of employees, and size of productive areas) is also difficult to report at this stage since there are no relevant published reports or studies for the Gilbert, Line, and Phoenix groups. It can be reported, however, that the major crops are coconut, copra, vegetable, and banana for the Gilbert group, while coconut and copra are mostly common only for the Line and Phoenix groups.

1.5. INDUSTRIAL EMPLOYMENT BY MAJOR ECONOMIC SECTORS

Table 1.B: Industrial Employment by Major Economic Sector

ISIC Code	Description	Number of Facilities	Total Employment	Output Value (per year)	Major Emissions (type)
31	**Food Industry**[1]	-	47	-	-
32	**Textiles/Clothing And Leather Goods**	-	18	-	-
33	**Wood and Wood Products, Printing**[2]	-	66	-	-
34	**Paper and Paper Products**	-	-	-	-
35	**Chemical/Coal/Petrol Plastic Products**	-	-	-	-
36	**Non-metallic Mineral Products**	-	-	-	-
37	**Basic Metals Industry**	-	3	-	-
38	**Fabrication of Machinery and Equipment**[3]	-	62	-	-
39	**Other Manufacturing Industries**[4]	-	-	-	-
	Mining and Extraction (Coal/Oil/Natural/Gas/ Minerals/Metals)	-	-	-	-
	Electric Generation[5]	-	177	-	-
	Dry Cleaning	-	-	-	-
TOTAL		**-**	**373**	**-**	**-**

1. Food enterprises including Tarawa Biscuit
2. Betio Shipyard, Other furniture manufacturer, Other transport manufacturer, Government printery, and Other printery service
3. Joinery department and PVU (estimate of about 50 from Min. of Works & Energy)
4. Beverage/sour toddy, footwear company
5. PUB

1.6. COMMENTS/ANALYSIS

The population on South Tarawa has notably increased (from 36 % for 1995 census, to 40 % for 2000 census, to 44 % for 2005 census. Increase in population coupled with high commercial activity, would normally be associated with increase in the use of chemical related products, exposure to hazardous and toxic waste, harmful chemical wastes entering the environment, and the quantity of chemical related waste generated. This situation also has unfavourable implications on resources that have already been stretched including infrastructure available on the island for efficient chemicals and waste management.

Chemicals, particularly greenhouse gases could contribute to global warming, ozone depletion, and climate change. Uncontrolled disposal of chemicals could contribute to environmental degradation through the contamination of water, soil, air, and biodiversity. The fragile ecosystems of Kiribati such as limited landmass, fresh groundwater, and agriculture and fisheries productivity are adversely affected by climate change, and the degradation of which would be further exacerbated by the effects of uncontrolled disposal of hazardous and toxic chemicals.

The political structure in Kiribati has influence on jurisdictional aspects of chemicals and waste management. Local authorities particularly island and town councils are responsible for implementation of pollution control including waste management and enforcing of chemical related laws. Local authorities work with Government ministries including the Ministry of Environment, Lands and Agriculture Development (MELAD), the Ministry of Internal and Social Affairs (MISA) , and the Ministry of Health and Medical Services, for the effective implementation of pollution control such as illegal dumping of toxic wastes, solid waste management, and public health programmes. The Ministry of Commerce, Industry and Cooperatives and the Ministry of Finance and Economic Development also works with Local authorities on trade including the importation of chemicals.

CHAPTER 2

CHEMICAL PRODUCTION, IMPORT, EXPORT AND USE

2.1. INTRODUCTION

Chemicals in Kiribati are used for a broad range of purposes, from those bought from retail shops for personal care, for automobiles, to medical uses, domestic applications such as for cleaning, and for educational purposes, through to agricultural and industrial uses. Kiribati does not manufacture and export but mainly imports chemicals for use in the country. This chapter provides basic information about the existence of chemicals, through production and import, export and use in Kiribati.

2.2. CHEMICAL PRODUCTION, IMPORT AND EXPORT

With limited resources and lack of major investments, there are no significant manufacturing industries for chemical production. Kiribati however, imports most of chemicals for use in agriculture, health, sanitary, transportation, education, and for processing in a few industries, and other consumer-related chemical products. Chemicals are not exported directly, but some products made from imported chemicals are further exported and could still be used as chemicals such as processed copra products in the form of oils and soaps.

Table 2.A: Chemical Production and Trade

Chemical Type	Production/ Manufacturing (tons/year & value)	Imports (tons/year & value)[1]	Formulation/ Packaging (tons/year & value)	Exports (tons/year & value)
Pesticides (agricultural, public health & consumer use)	-	AU$116, 318.00		-
Fertilisers	-	AU$38, 121.00	-	-
Petroleum Products	-	AU$20 m	-	-
Industrial (used in manufacturing/ processing facilities)	-	-	-	-
Consumer chemicals (unknown/mixed use)	-	-	-	-

1. All 2006 values (National Statistics Office, 2008)

2.3. CHEMICAL USE BY CATEGORIES

Table 2.B: Chemical Use by Categories

Type of Chemical	**Number of Tons Used per Year in the Country**
Pesticides – Agricultural	2.4
Pesticides – Public Health	4.0
Pesticides – Consumer Use	1.2
Fertilisers	1.6
Petroleum Products	20.6 m[1]
Industrial Chemicals (used in manufacturing/processing facilities)	-
Consumer Chemicals[2]	3.6
Other Chemicals (unknown/mixed use)	-
TOTAL	6,012.8

1. 2007 value in million tons. Petroleum products comprised of Automotive Diesel Oil (ADO), Unleaded Petrol (ULP), Dual Purpose Kerosene (DPK), and Jet A1 (Langley, D., KOIL, 2008)
2. Chemicals used by consumers in Kiribati are those obtained from wholesale and retail stores. These chemicals are normally used for domestic purposes, for example, cleaning products such as disinfectants, insecticides, and personal care products.

2.4. CHEMICAL WASTE

Several studies focusing on the more urbanised areas in Kiribati of South Tarawa and Kiritimati have been conducted on the general household waste stream. However, very limited information was available on chemical waste only. A recent study by GHD Pty Ltd consultants through MELAD's POPs programme (July 2008), with a focus on hazardous waste existing on Tarawa and Banaba, and was able to provide more comprehensive information on chemical waste.

Table 2.C: Chemical Waste Generation and Trade

Type of Chemical Waste	Generation (tons/year)	Export (tons/year)	Import (tons/year)
Petroleum products waste	16[1]	-	-
Obsolete Pesticides	5.2	-	-
Obsolete Fertilisers	1.6	-	-
Obsolete Pharmaceuticals	-	-	-
Obsolete School chemicals	-	-	-
Obsolete chemicals from Wholesalers	-	-	-
Consumer chemicals	3.6	-	-
TOTAL			

1.Waste oil shipped to Australia in 2007. The volume was an accumulation from previous years (Langley, KOIL, 2008).

Figure 2.1: Storage of obsolete chemicals is the only current safe disposal option but they still pose potential risks to the environmental and human health.

2.5. COMMENTS/ANALYSIS

Chemicals are mainly imported and used in Kiribati. Petroleum products dominate trade and were the highest used chemical type in the country. Lack of data has resulted in some chemical data not being able to be reported including consumer and pharmaceutical chemicals. Some data can only be reported partially, such as petroleum waste products in the form of waste oil, however an accurate figure for each year was not able to be determined since data recorded was a result of accumulation of waste oil previously.

Currently, accurate chemical related data could not be obtained for chemical waste generation from different industries including chemicals used in the private sector. This difficulty is attributed to the lack of proper infrastructure particularly for disposal, recycling, and recovery in the country. Most of the facilities used for chemicals storage and disposal are currently not being monitored for waste generated, and health and environmental impacts. Gaps in data collection exist across ministries and the private sector.

However, improvements by Government are progressing in addressing chemical management issues. Kiribati is a party and actively participating in international and regional chemical related agreements. Previous cooperation programmes have contributed to addressing waste (including chemical wastes) disposal such as through the provision of hospital incinerators by the Sanitation, Public Health, and Environment Improvement (SAPHE) project, and data collection on Persistent Organic Pollutants (POPs) chemicals through the UNEP POPs project. The recent study by GHD consultants enabled through the POPs project provided inventory of chemicals and technical review of chemical related facilities particularly for South Tarawa and Banaba.

2.6. RECOMMENDATIONS

- National key stakeholders recommended that a committee be established with a responsibility to oversee, manage, and regulate the importation of chemicals. The current NCMC may be utilised for this purpose.

- To improve efficiency of national reporting and chemical related policy development, it is recommended that chemical data from various sectors is regularly updated to a centralised system such as with ECD through the NCMC.

- There is a need to improve the capacity and mechanism for data collection related mainly to chemical import, use, waste generation, and export. More data generation can be encouraged through the use of chemical registration, monitoring, and inventories by all key industries including the private sector on all islands e.g. for chemicals storage and transportation, regular stocktaking of chemicals used, and chemical waste such as waste oil, obsolete chemicals, and emissions. Improving the collection of and increasing the amount of relevant chemical data more strategically would improve data availability and reliability for more accurate reporting. Such approach may be through mandatory sector policies and provision of resources for the integration of chemical data collection and sharing at different levels.

CHAPTER 3

PRIORITY CONCERNS RELATED TO CHEMICAL PRODUCTION, IMPORT, EXPORT AND USE

3.1. INTRODUCTION

This chapter provides an overview of the nature of problems related with chemical production, trade and use, and the chemicals or categories of chemicals which are causing the concerns. The recent study report by GHD Pty Ltd consultants under MELAD has been helpful in highlighting current priority concerns related mainly to chemicals in Kiribati particularly for Tarawa and Banaba.

3.2. PRIORITY CONCERNS RELATED TO CHEMICALS IMPORT, PRODUCTION, AND USE

Chemicals that are hazardous and toxic are mainly the ones raising concerns, particularly in their exposed states for prolonged periods, which have rendered them harmful to the environment and health of the population. The first four issues in Table 3.A. have been identified as priority concerns by national stakeholders following the study on chemical and waste management by GHD Pty Ltd consultants conducted in July 2008.

TABLE 3.A: DESCRIPTION OF PROBLEM AREAS

Nature of Problem	City/Region	Brief Description of Problem	Chemical(s)/ Pollutants (s)
Buildings (walls including cement sheeting and roof) were constructed with materials that contain asbestos products. Most buildings on Banaba were remains of those built during the phosphate mining era (ended in 1979).	Banaba Island	- Many buildings have lost or were losing their roofs and asbestos were common to see around residences. - Old phosphate mining buildings and surrounding areas were littered with asbestos. - The significant presence of asbestos clearly poses a huge exposure risk to the population, which can further be exacerbated by extreme weather conditions e.g. strong winds.	Asbestos
Bitumen remains identified were once used to upgrade the airport runway in the late 1980's at Bonriki international airport. Bitumen contained in drums was initially located at the northern side as a heating area for bitumen prior to application on the airport's runway. Bitumen found on the southern side of the runway has resulted from spilled bitumen that has only been partially removed.	Bonriki Airstrip area	Bitumen at northern side of runway: - Drums used to store bitumen have corroded and spread to the nearby shore platform where bitumen is now regularly submerged by seawater and highly likely to contaminate the sea water and marine animals of the intertidal zone. Bitumen from the drums has also leaked out into dry depressions in the sand dunes along the shoreline and likely to contaminate ground water, the intensity of which was further aggravated when it rained. Bitumen at southern side of runway: - Remains of bitumen were observed to have found their way into an old well and have reached the groundwater which is less than 2 meters in this area. Bitumen removed by machinery had been deposited over the low sea cliff on the shore platform and were entering the sea. Bitumen had also been	Bitumen containing PAH and Heavy Chain Hydrocarbons

		pushed into a water filled depression with a level to that of the water table. Within 50 meters of the edge of the leaking bitumen are occupied dwellings that all rely on groundwater for domestic purposes including drinking water. Water samples collected from the nearest household's well had hydrocarbon odour, and lab tests confirmed the presence of hydrocarbons. The shore platform and soil in the surrounding area are likely to be contaminated by hydrocarbons. The water table was confirmed to be contaminated with Polycyclic Aromatic Hydrocarbons (PAH) and Heavy Chain (HC) Hydrocarbons. The hydrocarbon contaminants identified are difficult to degrade and are the most toxic of the hydrocarbon group. - The contaminants plumes are also likely to spread in the direction of groundwater flow and may reach other residential areas and particularly the groundwater reserve. Should the problem be allowed to continue, there would be a high risk to residents and also population on South Tarawa that relies on the reticulated water system sourced from the groundwater reserve in Bonriki.	
The main high temperature incinerator installed around 2002 has deteriorated over the years and only significantly in late 2007. The current state of the incinerator is highly likely to be causing significant and serious environmental and health problems to operators, the hospital area, and nearby residents.	Tungaru Central Hospital, Nawerewere, Tarawa	The high temperature incinerator has long been deteriorated and cannot operate to its expected temperature at around 750 ^{0}C with a capacity of approximately 50 kg per charge. The present state of the incinerator has resulted from broken and worn out parts (Air delivery/blower pipe, cyclone pipe, ventilation fan above cyclone). The present state of the incinerator has resulted in the following: - Complete combustion cannot occur due to lack of	Mercury Dioxins Furans Particulate matter Infectious medical waste

	air/oxygen that can be forced into the combustion chamber, thus resulting in black, coke-like product at base of incinerator after each burn. - Operation of the furnace at lower than expected temperature (only around 250 ^{0}C) likely results in the formation of dioxins and furans that are dispersed through smoke over the hospital and residents. - Malfunction of the stack ventilation fan results in poor rapid dispersion of gases and smoke, thus causing odour, and are likely to be deposited on the surrounding buildings and houses. - Delivery pipe is blocked with ash. Recovered particulates drop out on the ground where they should have been collected in container at the base of the incinerator pipe. A significant amount of particulate matter is also found throughout the chimney stack, and with the broken cyclone pipe, the particulate matter continue to escape to the surrounding environment (hospital and residential areas). - The main large incinerator plus two other small ones currently does not have the capacity to cope with the waste generation and cannot adequately burn chemical substances to render them safe. - Disposal of Mercury thermometers with other sharps and incinerating them is a highly dangerous practice posing health risks from Mercury toxicity.	Odour

		- Lack of waste sorting from infectious and non- infectious materials poses serious health risks to the incinerator operators, and magnified by the lack of proper personal/worker's equipment (PPE).	
- The site owned and managed by Kiribati Oil Company Ltd (KOIL) had only been purchased from Mobil in June 2007. The site is the main storage on the island of large fuel tanks storing ADO, ULP, JETA1, and DPK, 200L fuel drums, mobile tanks, waste oil, and a gas refilling shed. - The central part of the site is bunded with three foots walls, while the base of the bund is made of gravel (dead coral pieces). - Mobil undertook sampling and assessments of the groundwater within its premises. KOIL and MELAD do not have records of these environmental assessment reports. KOIL staff monitors the groundwater only on the physical aspects e.g. thickness of separate phase.	KOIL, Betio, Tarawa	Recent inspection of KOIL site by MELAD and GHD Pty Ltd consultants (July 2008) found the following: - The base of the bund covered with permeable coral means that the spills are not fully contained and downward movement of the spills are likely to cause groundwater contamination. - Groundwater samples collected (2 m to groundwater depth) from three KOIL site remediation bores were analysed, and found to have strong petroleum odour, yellowish colour with apparent presence of oil sheen, and most importantly the presence of hydrocarbons were confirmed. Thus, groundwater at KOIL's site is apparently contaminated and is likely to spread beyond KOIL's premises. - Analysis of groundwater sample collected from a household well (1.2 m to groundwater depth) located just outside KOIL's boundary fence, was also found to have strong oily odour, slight yellowish colour, the presence of oil sheen, and the presence of hydrocarbons. This confirms that petroleum oil product spills/leakage from KOIL site has actually spread to residential areas, contaminating groundwater, and posing high risks to the limited water resource on the island and health risks to the surrounding population.	Hydrocarbons ($C_6 – C_{30}$) Odour Petroleum Oil

The storeroom at Agriculture Division was used for storage of chemical wastes including hazardous, expired animal pharmaceuticals, and pesticides. Agriculture Division's storeroom also accommodates storage for chemicals from other departments within MELAD. The storeroom not only stores chemicals but also other agricultural wastes including old files.	Agriculture Division, MELAD, Tanaea, Tarawa	The study team from MELAD (July 2008) inspected the storage room and found the following: - Chemical wastes including hazardous ones were mixed including with other agricultural wastes and were poorly organised. - Significant volumes of copper arsenate (a Restrictive Poison) were stored in open-top plastic buckets in solid form and surrounded the storeroom. This places significant environmental risk if released to the environment. - Unused metal-based salts purchased for an experiment was never used and unless stabilised and properly disposed, they would pose environmental and health risks. - Unlabelled chemicals were also identified and they pose risks if they do contain hazardous and toxic substances. - Expired animal pharmaceutical chemicals placed in garbage bags are also risks to the environment and human health if they are released.	Hazardous, toxic, and obsolete chemicals (includes pesticides, fertilisers, animal pharmaceuticals and other agricultural chemicals (included in Annex 1)): e.g. - Copper arsenate, picric acid, metal-based salts unsuitable for stabilisation, organic solvents, other unlabelled chemicals
<u>X-Ray Department:</u> The department prepares X-Ray images from developer/fixer system supplied by Kodak (RPX-OMAT). Disposal of waste of about 40 L/week is through the drainage (via septic tank and then to sewer).	Tungaru Central Hospital, Nawerewere, Tarawa	<u>X-Ray Department:</u> Levels of silver in the waste are not removed prior to disposal and as a biocide, silver poses risks to the marine environment where ultimate disposal via the sewer ends up in the ocean.	<u>X-Ray Department:</u> Silver (in form of silver thiosulphate) from X-Ray films

Laboratory Department:
Varying laboratory processes produces waste products and where staff was not sure of disposal options.

Pharmaceutical stores:
Chemicals stored both at the Pharmaceutical stores and containers were old and disused chemicals and have been stored for several years. Staffs were not sure of their uses, hazardous risks, and options for their safe disposal.

Laboratory Department:
Xylene/methanol solution (30 L):
- No safe on-island disposal options for these organic compounds and could not be incinerated with current temperature of the incinerator.

Cyanide complexes (waste test solutions for haemoglobin):
- Approx. 400 L stored in plastic vessels. Cyanide concentration in these waste products was unknown but likely to be sufficient to cause concern. Cyanide being very toxic could threaten marine life if disposed down the drainage.

Fuchin, phenol, ethyl alcohol (from TB colour carbol fuchsin solution, a reagent for microbiological staining):
- Environmental toxins and are very hazardous when in contact with skin. Presently there are no on-island disposal options.

Uranyl acetate made from depleted uranium (for specific staining in electron microscope):
- contains uranium although in non-significant amounts, it is still a radioactive material. No disposal options are available on the island.

O-toluidine (Class 6.1 hazardous substance) containing compounds of benzene, toluene and aniline:
- The chemical is a poison and a possible human carcinogen. It causes harm when inhaled or ingested, an irritant to skin, and may lead to cyanosis, dermatitis or nausea. There is also no on-

Laboratory Department:
-Xylene/methanol solution (30 L)
- Cyanide complexes (waste test solutions for haemoglobin)
- Fuchin, phenol, ethyl alcohol (from TB colour carbol fuchin solution, a reagent for microbiological staining)
- Uranyl acetate made from depleted uranium (for specific staining in electron microscope)
- O-toluidine (Class 6.1 hazardous substance) containing compounds of benzene, toluene and aniline

Pharmaceutical storage
Disused chemicals include:
- Phenol, Acetic acid, Benzidine (hydrochloride), Dextrose in Na2Cl, Sodium lactose, Creosol, O-Toluidine, Uric acid, Propenol, Nitric acid, Orthophosphoric acid, Xylene sulphur, Acetone, Diethyl ether, antibiotics, and Unknown chemicals.

		island disposal option presently available for this chemical. Pharmaceutical storage: Most of the chemicals are hazardous and toxic and pose risk to the environment and human health when released. There are currently no other on-island safe disposal options for the disused chemicals in the stores.	
The secondary schools on South Tarawa stores chemicals for experimental purposes. Some of the chemicals however are hazardous and toxic and some have been expired. The schools have problems with disposal of used, expired, and hazardous/toxic chemicals.	Junior and Senior secondary schools, Tarawa and outer islands including Line and Phoenix Groups	Mercury Five small bottles of elemental mercury metal and compounds are now stored at KGV/EBS school except one bottle remains at St. Louis for demonstration purposes. There are no re-sale or safe disposal options on the island. Dichromate This chemical stock can be stabilised but requires treatment first (reduction of hexavalent chromium to trivalent chromium) before it can be stabilised with other metal salts. Presently there are no reducing agents available e.g. sodium metabysulphite on the island, and the only option is continued storage of this chemical until such a treatment is possible. Organic liquids/solvents These chemicals include chloroform and other chlorinated solvents (xylene, toluene) are not suitable for stabilisation and there are no appropriate disposal options on-island. Export may be possible but need further work by MELAD.	Mercury Dichromate Organic solvents (e.g. Acetamide, chlorophenol, chloroform) Metal-bases salts unsuitable for stabilisation (e.g. Mercury sulphate, Mercurous oxide, Ammonium thiocyanate) Unknown Chemicals

	Unknown Chemicals About 100 bottles of unknown chemicals both liquids and solids remain at KGV/EBS school. The chemicals have historically been used for science laboratory experiments, but have lost their labels over the years. Identifying these chemicals offshore would be costly.	

TABLE 3.B: PRIORITY CONCERNS RELATED TO CHEMICALS

Nature of Problem	Scale of Problem	Level of Concern	Ability to Control Problem	Availability Of Statistical Data	Specific Chemicals Creating Concerns	Priority Ranking[1]
Air Pollution	local	high	low	no data	Asbestos, POPs (dioxins[2], furans), Particulate matter, carbon monoxide	1
Pollution of Inland Waterways	local	low	low	no data	-	-
Marine Pollution	regional	high	low	insufficient	Heavy chain hydrocarbons, PCBs, mercury, silver, cyanide	2
Groundwater/Drinking Water Pollution and Contamination	local	high	medium	insufficient	Heavy chain hydrocarbons, heavy metals	1
Soil Contamination	regional	medium	low	no data	Heavy chain hydrocarbons, pesticides (copper arsenate), heavy metals	2
Chemical Residues in Food	regional	low	low	no data	-	3
Hazardous Waste Treatment/Disposal	regional	high	medium	sufficient	Mercury, Uranyl acetate, O-toluidine, Cyanide complexes, Fuchin, phenol, ethyl alcohol, Benzidine, picric acid, copper arsenate, metal-based salts unsuitable for stabilisation.	2
Occupational Health: Agriculture	regional	medium	medium	no data	-	-
Occupational Health: Industrial	local	medium	medium	no data	-	-
Public Health	regional	high	medium	insufficient	As with above	-
Chemical Accidents: Industrial	regional	low	medium	no data	-	-
Chemical Accidents: Transport	local	low	medium	insufficient	-	-

Unknown Chemical Imports	local	low	low	no data	-	-
Storage/Disposal of Obsolete Chemicals	national	high	medium	insufficient	As in Table 3.A.	2
Chemical Poisoning/Suicides	local	low	low	insufficient	Lead acid	4
Persistent Organic Pollutants	national	high	medium	insufficient	Dioxins, furans	2

1. Ranking of the problems where 1 indicates the problem creating highest concern and 4 the least concern.
2. National dioxin emissions have been estimated at 391 mg TEQ/yr placing Kiribati as the second highest dioxin emitter compared to other Pacific islands (UNEP, 2002).

3.3. COMMENTS/ANALYSIS

The study by GHD Pty Ltd consultants under MELAD's POPs programme (July 2008, section 6.4) with inputs from the NCMC has been timely to provide updated information for this chapter. The following summarised the main issues and concerns discussed in this chapter:

- The high risk to human health from prolonged exposure to asbestos remains on Banaba Island

- Bitumen containing PAH and heavy chain hydrocarbons adversely affecting marine life and contaminating groundwater in Bonriki with likely risks when reaching the main fresh groundwater reserve

- The degraded TCH main incinerator has caused inefficiency to its operation which has resulted in unrestricted emission of particulate matter, POPs, other gases, and odour, which are affecting the hospital and the surrounding residential area, and compounding the problem of accumulation of toxic and infectious waste

- The contamination of groundwater by heavy chain hydrocarbons and PAH at KOIL's premises and that of nearby residents. This issue is similar to that resulting from PUB's powerhouse where waste oil leakage has also contaminated the groundwater table and has also affected groundwater of nearby residents

- Hazardous and toxic chemicals were found in schools as they are still used as part of the Ministry of Education's science school curricula.

Chemical waste remediation and promotion of sound chemicals management would ensure prevention and/or minimisation of the harmful effects of hazardous and toxic chemicals on the environment that have now become serious risks. The urgent need to address the priority concerns would protect the environment particularly the quality of fresh groundwater, the productivity of agriculture and marine fisheries, and also reduce the need for more difficult and costly environmental remediation if left to a much later stage.

3.4. RECOMMENDATIONS

- Immediate attention should be given for addressing the priority concerns identified and discussed (Table 3.A and 3.B). Appropriate actions should be taken by MELAD, MHMS, KOIL, MEYS, and other concerned agencies.

- It is important and recommended that the school curriculum be revised in order to eliminate the use of hazardous and toxic chemicals and replace them with alternative safer chemicals

- Environmental monitoring and assessments of environmental and health risks should be conducted or strengthened and mechanism for data collection and storage be improved, to be able to provide

- updated data and information particularly for areas of priority concern. These include monitoring of groundwater in high risk areas of Betio and Bonriki, and gas emissions from incinerators at the TCH hospital and extent to the surrounding residential areas. to urgently address the above priority concerns

- Law enforcement for environmental and health should be strengthened to minimise adverse effects of chemicals on the health of the population and the environment

- Future studies similar to that conducted by GHD consultants should also be conducted for the Line and Phoenix groups and other outer islands to provide for more comprehensive national chemical data and chemical management related information. Other scientific and related studies should also be considered to provide Government with a science-based rationale and to continually assist in assigning of priorities for action. Such studies may include monitoring and assessment of air, land and groundwater quality, environmental and health assessments of marine resources in relation to chemical contamination, and monitoring and assessment of the extent of the transboundary movements of toxic and hazardous chemicals within the region and in Kiribati.

CHAPTER 4

LEGAL INSTRUMENTS AND NON-REGULATORY MECHANISMS FOR MANAGING CHEMICALS

4.1. INTRODUCTION

The nature of chemicals management is a cross-sectoral matter and legislation, regulations, or standards in the country are often fragmented. Many of these laws may not directly target chemicals, however, they may still be relevant for chemicals management from import, through to use, export or disposal.

This chapter provides an overview of existing legal instruments and non-regulatory mechanisms related to the management of chemicals; addresses the implementation and enforcement of these instruments and mechanisms, and identifies relevant strengths, weaknesses and gaps.

4.2. OVERVIEW OF NATIONAL LEGAL INSTRUMENTS WHICH ADDRESS THE MANAGEMENT OF CHEMICALS

TABLE 4.A: References to Existing Legal Instruments Which Address the Management of Chemicals

Legal Instrument (Type, Reference, Year)	Responsible Ministries or Bodies	Chemical Use Categories Covered	Objective of Legislation	Relevant Articles/ Provisions	Resources Allocated	Enforcement Ranking
Environment Act No. 9 of 1999	MELAD	Applications directly to or those that may pose adverse effects to the environment.	To provide for the Protection, Improvement and Conservation of the Environment of the Republic of Kiribati and for connected purposes.	s.31. Application for an environment license, s.33-39: Requirements of environmental impact assessment report, s.45-47: Management of protected areas s.49-55: Enforcement powers, s.57-59: Compliance and Clean Up Notices, s.60-63: Infringement notices and Improvement plans s.64: Amending, suspending, revoking and withholding other authorizations s.66-71: Provisions relating to contraventions of the Act s.80: Making and effect of environment protocols, s.81: Environment committees s.83: Public register of applications, licenses, etc.	-	-

				s.85: Making of Regulations by the Minister		
Chemical Weapons (Prohibition) Act No. 2 of 2006	Office of Te Beretitenti	Development, production, storage, transportation, and use of chemical weapons (toxic chemicals and precursors, and munitions and devices designed to cause death or harm).	To implement the provisions and obligations of Kiribati under the Chemical Weapons Convention and for Related Matters.	s.5: Acts of offence in the use of chemical weapons. s.6: Forfeiture and seizure of chemical weapons s.8: Use of toxic chemicals and precursors listed in Schedule 1 of the Act s.9: Imports and exports of toxic chemicals and precursors s.11-13: Supply of information on production, acquiring, storage, transfer and use of toxic chemicals or their precursors s.15-20: Facilitation of inspections under the Convention s.21-24: Enforcement provisions s.27-28: Liability of a body corporate and Confidentiality s.30: Making of Regulations and amendment of the Schedule of the list of chemicals for the purpose of chemical weapons.	-	-
Pure Food Ordinance CAP. 84	Ministry of Health	Medicinal, composition of, and preparation of human food, or selling for consumption or use by man.	To secure the wholesomeness and purity of food.	s.5: Sales of food with mixed chemical ingredients so as to be injurious to health s.13: Analysis of identity of food s.22: Forfeiture of food related to conviction under the Ordinance s.29: Making of Regulations related to the standards for quality of any food	-	-

				from manufacturing to sales.		
Pharmacy & Poisons Ordinance CAP. 70	Ministry of Health	Importation, sales, supply, distribution of medicines and poisons.	To control the practice of pharmacy and the sale and distribution of drugs and poisons	s.17: Register of Pharmacists s.20: Examination of a pharmacist applicant s.28: Corporate body carrying on a business of pharmacist s.33: Dispensation of any drug or medicine only by registered pharmacist s.37: Issuing of prescriptions by a medical practitioner s.38: record of prescriptions s.42: Restrictions on supply of certain medicines s.45: Sale of drugs or medicines s.46: Medicine licence s.51. Labels on medicines imported s.52: Prohibition of importation of certain drugs s.53: Importation and sale of poisons s.54: Poisons licence s.57: Prohibition and regulations with respect to the sale of poisons s.58: Exemption with respect to medicines s.59: Exemption with respect to sales to certain persons s.62: Power of the Minister to make regulations with respect to the manufacture of pharmaceutical preparations containing poisons and; sale and supply of poisons s.64: Application of Customs Ordinance in the prohibition of certain drugs and	-	-

				poisons. Schedule 2 (s.19) – List of chemical articles not prohibited for sale; Schedule 3 (s.53) – List of Poisons prohibited for sale except in the manner prescribed in this ordinance.		
Dangerous Drugs CAP. 23	Ministry of Health	Importation, manufacture, sale, distribution, and export of dangerous drugs.	To control the importation, transit, manufacture, sales, distribution, and export of dangerous drugs.	s.11-12: Prohibition of importation, exportation, manufacture, sales or use of opium s.15: Power of the Beretitenti with advice of Cabinet to make Rules for controlling the manufacture, sale, possession, distribution and custody of any or all dangerous drugs. This includes: - regulating of the issue of prescriptions containing such dangerous drugs and the dispensing of any such prescription by medicinal practitioners; - recording and keeping of information on the manufacture, sale or distribution of dangerous drugs; - authorising of business activities in accordance with Pharmacy & Poisons Ordinance. s.21-24: Export of dangerous drugs s.25: Importation of dangerous drugs s.31. Dangerous drugs in transit s.32: Removal of licenses s.33: Drugs not to be tampered with	-	-

				s.39: Offences and penalties Part I of Schedule 2 – substances dealings in which are subject to control; Part II of Schedule 2 – preparations and other substances falling within Part I whose Importation and Exportation is exempted from control.		
Petroleum Ordinances	Ministry of Works and Energy	Storage, importation, and testing	Prevention of accidents	-	-	-
Quarantine Ordinance	Ministry of Health	Chemical disinfection of vessels	To disinfect infected vessels	-	-	-
Shipping Ordinance CAP. 93	Ministry of Information, Communication, and Transport (MICT)	Transport of Dangerous Cargoes on Sea	To control sea transportation of dangerous cargoes	-	-	-
Merchant Shipping Oil Pollution Gilbert Islands Order of 1975	MICT	Liability for Oil Pollution	Control of Oil Pollution	-	-	-
Nuclear Installation Act of 1965	MELAD	Transportation of radioactive material	Protection from radiation	-	-	-

Customs Act of 2004	Ministry of Finance & Economic Development (MFED)	Importation of chemicals	Control of the importation of dangerous chemicals	-	-	-
Education Ordinance CAP. 29	Ministry of Education, Youth and Sports (MEYS)	Regulation of basic curricula for schools; Standards required for teaching qualifications	Promotion and provision of education and training opportunities	s3: Promotion of education by the Minister to ensure that education and training opportunities are provided at different levels s9 (a) The Educational Advisory Committee shall "consider and make recommendations upon any matter referred to it either under the provisions of this Ordinance or by the Minister" s9 (b) "to advise and assist the Minister on the formulation of plans and policies for the development of education"	-	-

4.3. SUMMARY DESCRIPTION OF KEY LEGAL INSTRUMENTS RELATING TO CHEMICALS

The legal instruments relating to chemicals are provided for in Table 4.A above. The laws commonly aim to protect Kiribati' environment and population by controlling and regulating the importation, manufacture, sale, distribution, use, export, and other movements of chemicals including those that are dangerous and may cause harm. Other than chemicals that are intended for direct human application or consumption (such as food additives, cosmetics, pharmaceuticals), the key legal instruments for regulating other chemicals particularly of hazardous and toxic nature are:

- Environment Act No. 9 of 1999
- Chemical Weapons (Prohibition) Act No. 2 of 2006
- Pharmacy & Poisons Ordinance CAP. 70
- Dangerous Drugs CAP. 23
- Petroleum Ordinance
- Shipping Ordinance. CAP. 93
- Merchant Shipping Oil Pollution Gilbert Islands Order 1975
- Nuclear Installation Act of 1965
- Customs Act of 2004
- Education Ordinance CAP. 29

Some chemicals are specifically listed and issues such as non-compliance are addressed in several legislations such as the Petroleum ordinance, Pharmacy & Poisons Ordinance, and Dangerous Drugs ordinance.

All Bills and Legislations are made publicly known in the process of Parliament hearings, and legislations are made available within the records of the laws of Kiribati preserved at the Attorney General's Office. Copies of these laws can also be accessed through the Parliament library, and offices of responsible Ministries.

4.4. EXISTING LEGISLATION BY USE CATEGORY ADDRESSING VARIOUS STAGES OF CHEMICALS FROM PRODUCTION/IMPORT THROUGH DISPOSAL

Based on information provided in sections 4.2 and 4.3, Table 4.B provides a strategic overview of the legal instruments that regulate each stage of chemicals from production/import through disposal, for each of the main use categories of chemicals addressed in this profile. The overview should assist in identifying gaps hence providing opportunities for strengthening the existing system.

TABLE 4.B: Overview of Legal Instruments to Manage Chemicals by Use Category

Category of Chemical	Import	Production	Storage	Transport	Distribution/ Marketing	Use/ Handling	Disposal
Pesticides (agricultural, public health and consumer use)	X		X[1]			X	
Fertilisers	X		X			X	
Industrial Chemicals (used in manufacturing/ processing facilities)			X	X		X	
Petroleum Products	X		X	X	X	X	
Consumer Chemicals	X		X		X		
Chemical Waste			X				
Chemical Weapons	X	X	X	X	X	X	
Others							

1. An "X" denotes that the specific stage of the Category of Chemical is adequately addressed through legislation

4.5. SUMMARY DESCRIPTION OF KEY APPROACHES AND PROCEDURES FOR CONTROL OF CHEMICALS

Some procedures for the control of various classes of chemicals and for the different stages of their life-cycle e.g. classification and labeling of chemicals/products, registration of products, permits (e.g. for discharge), licenses (e.g. to operate), reporting requirements, inspections, information to be provided, etc., may be available within responsible ministries, agencies and institutions. However, the collation of such information was not possible within the time of compilation of this profile.

TABLE 4.C: BANNED OR SEVERELY RESTRICTED CHEMICALS[1]

Name of Chemical	Level of Restriction (ban (B) or severe restriction (SR))	Details of Restriction (e.g. reason for control action, remaining allowed uses)
DDT	B	Not in use
Mercury	SR	Contained in hospital equipments and some schools for demonstration purposes
PCB	SR	Remains still found in old transformers

1. Following the criteria established by the FAO/UNEP Joint Group of Experts on Prior Informed Consent. Other banned or severely restricted chemicals that are still found in Kiribati are reported in GHD consultants and MELAD report (Annex 2).

4.6. NON-REGULATORY MECHANISMS FOR MANAGING CHEMICALS

Several non-regulatory mechanisms exist for managing chemicals. These include:

- The levy of tax on imported items which includes chemicals under the Customs legislation
- Available and accessible information to workers in the form of operational manuals, codes of conduct, guidelines for quality control, and other relevant manuals such as for dangerous goods for air transportation, are constantly consulted and often used as reference documents for appropriate management of chemicals
- Awareness and voluntary campaigns e.g. during world environment days, community clean-ups, workshops and school activities such as quiz and speech competitions
- Training programmes for enhancing institutional capacity for the management of chemicals e.g. training workshops for lab technicians, petroleum products deliverers, and others working with chemicals. Awareness raising of chemical safety issues would reduce the occurrence of chemical-related accidents.
- Delivery of science education at different education levels establishes the foundation for knowledge of chemicals and their management
- Labels and other clear instructions posted at public places and institutions e.g. clearly labeled chemical related signs showing hazardous areas, labels school and industry chemicals, on containers recycling waste oil, and pesticide containers
- Complementary programmes provided by non-government and community-based organisations e.g. Waste management and environmental education programmes utilising drama groups

- Accidents and other related chemical incidences that may prompt affected individuals and affected bodies to improve chemical management

- Enabling Technical Assistance programmes under broader global/regional chemical-related programmes such as the POPs programme funded by UNEP and national implementation of SAICM funded by IOMC and UNITAR.

4.7. COMMENTS/ANALYSIS

The Government of Kiribati has showed her commitment to the management of chemicals through the range of chemical related laws now existing (Table 4.A). Some laws are the direct results of international conventions or agreements of which Kiribati is a party to and thus required to fulfill her obligations under the conventions. For example the "Chemical Weapons (Prohibition)" Act 2006 was made to implement the obligations of Kiribati under the Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction, established in 1993.

The existing laws (Table 4.A) broadly cover the priority concerns stated in chapter 3. However, there are still missing elements in the regulatory regimes to enable the full management of chemicals throughout their life cycle. For example, some regulations or protocols still need to be created for more effective chemicals management, such as for pesticides, gas emissions, disposal of used petroleum products, building codes for chemical storage, chemical waste cleanups and disposal, chemical handling in different industries, importation of building materials containing toxic chemicals, and controlling of the transboundary movement of hazardous and toxic substances.

Enforcement of the different legislations are not very effective and attributed to limited monitoring by most of the responsible ministries; insufficient resources, including financial, required for undertaking of proper monitoring and enforcement measures; lack of human resources (for example, the number of inspectors required for the whole country, and those qualified specifically for chemicals issues); and the non-prioritisation of chemicals management issues by key authorities such as MHMS for the hospital incinerator problem.

4.8. RECOMMENDATIONS

- Responsible ministries should encourage the review of existing laws and regulations, and initiate the drafting of appropriate regulatory regimes required to improve the effective management of chemicals within their jurisdiction. External support under relevant international conventions or environmental programmes could be utilised to achieve this

- Capacity should be strengthened within responsible ministries for effective follow up activities on chemical and related hazards and issues of concern, and sufficient resources committed for undertaking of such activities.

CHAPTER 5

MINISTRIES, AGENCIES AND OTHER INSTITUTIONS MANAGING CHEMICALS

5.1. INTRODUCTION

The management of chemicals for the different stages of the chemical life-cycle from production/import through to use and disposal is normally handled by several ministries, agencies, and other institutions. This chapter describes and analyses the mandates and programmes of different ministries, agencies and other governmental institutions responsible for, and concerned with, various aspects of chemicals management.

5.2. RESPONSIBILITIES OF DIFFERENT GOVERNMENT MINISTRIES, AGENCIES AND OTHER INSTITUTIONS

TABLE 5.A: Responsibilities of Government Ministries, Agencies and Other Institutions

Stages of Chemical Life Cycle / Ministry Concerned	Importation	Production	Storage	Transport	Distribution/ Marketing	Use/ Handling	Disposal
MELAD	X		X	X	X	X	X
MHMS	X		X	X	X	X	X
MLHRD			X			X	
MCIC	X				X		
MCIT				X	X		
Attorney General's Office	X	X	X	X	X	X	X
MFED	X						
MEYS	X		X			X	X
MWE	X		X	X	X	X	X
Private Sector	X		X	X	X	X	X

1. An "X" denotes a positive response.

5.3. DESCRIPTION OF MINISTERIAL AUTHORITIES AND MANDATES

The Ministry of Labor and Human Resources Development (MLHRD) and the Ministry of Health and Medical Services (MHMS) jointly responsible for chemicals management at the workplace through occupational health safety guidelines. The MHMS through its Public Health department ensures protection of community health by monitoring health hazards including chemicals that may act to adulterate food, water, and living environments of communities. The Environment department of the Ministry of Environment, Lands and Agriculture Development (MELAD) is responsible for protection of the environment (air, water, land, biodiversity) from activities including substances or chemicals that may have adverse effects on the environment e.g. pesticide control and petroleum products waste disposal. The Attorney General's Office (AG) and Office of *Te Beretitenti (OB)* is responsible for legislating and enforcing the control of all stages of the chemical's life cycle.

There are resources for chemical management, however, allocation of these, including for budget and person input, needs to be improved for the different requirements at the different stages of chemicals life-cycle. The type and level of expertise available for chemicals management activities are currently inadequate to sufficiently address the management of chemicals throughout their stages to the international standard required.

5.4. COMMENTS/ANALYSIS

Prevention of overlapping of mandates among ministries and bodies and the potential for duplication of activities and efforts are addressed by the Kiribati Development Plans (KDPs), which shows key policy areas (KPAs) of the Government, and incorporates Ministry strategic plans complementing and addressing the KPAs. The KDP shows the Lead Ministry with a mandate to ensure the full implementation of the strategy, and other Ministries that should offer support to the Lead Ministry in each particular strategy. The KDP is further addressed through Ministry Operating Plans (MOPs) published as one document and made available to all Ministries. The MOP is a form of a strategic work plan at the departmental level within each Ministry outlining its various efforts e.g. activities and programmes that should all contribute to the ultimate goal of achieving the KPAs, people's priorities, and Government's policy. The use of MOPs was fairly recently introduced to Ministries. The progress of MOPs are frequently monitored and reviewed.

5.5. RECOMMENDATIONS

Other bodies such as Government's companies and Associations including the Kiribati Chamber of Commerce and KANGO, whose activities are significant enough to positively impact on progress of Government ministries, should be incorporated in the KDP and MOPs or appropriate mechanism. This is necessary to further improve communication and coordination of efforts nationally, including in the effective management of chemicals.

The effective implementation of the various institutional mandates would depend on readily available resources (including financial, time, personnel, tools, and capacity). It is important that regular assessments for institutional capacity of concerned ministries be made to identify and prioritise needs for the effective implementation of national commitments.

CHAPTER 6

RELEVANT ACTIVITIES OF INDUSTRY, PUBLIC INTEREST GROUPS AND THE RESEARCH SECTOR

6.1. INTRODUCTION

Industrial organisations, research institutes, and non-governmental organisations (NGOs) play an important role in the management of chemicals through their programmes which normally supports Government's efforts particularly at the community or civil society level. This chapter provides information on all relevant programmes conducted by NGOs and entities on the management of chemicals.

6.2. DESCRIPTION OF ORGANISATIONS/PROGRAMMES

The major industrial organisations are owned by Government which includes the Kiribati Oil Company Ltd (KOIL), and the Kiribati Copra Mill Society (KCMS) Ltd. These industrial organisations are involved markedly in the import, sales/marketing, transport, storage and disposal of chemicals or chemical-related products. The companies operate independently but are often supported financially by Government.

Several organisations now exist as NGOs and most are registered as incorporated societies under the umbrella of the 'Kiribati Association of NGOs' (KANGO). These organisations include the National Women Federation - *Aia Maea Ainen Kiribati* (AMAK), Red Cross Society, Fisherman's Association, Handicap Association - *Te Toamatoa,* Foundation of the People of the South Pacific (FSP), Workers Union, and other community-based organisations. Financial assistance for organisations' programmes is normally sourced through KANGO and MFED. Programmes of NGOs are often implemented in partnership with relevant Ministries. Some previous chemical related programmes include for example the use of tie-dyes and paints in training programmes of AMAK, and the sorting of household waste containing chemical waste such as batteries. At this stage, there are no specific chemical related activity or programme directly for chemicals management.

6.3. SUMMARY OF EXPERTISE AVAILABLE OUTSIDE OF GOVERNMENT

An overview of the type of expertise in NGOs that may be available to support national programmes and policies related to chemicals management are provided in Table 6.A.

TABLE 6.A: SUMMARY OF EXPERTISE AVAILABLE OUTSIDE GOVERNMENT

Field of Expertise	Research Institutes	Universities	Industry	Environmental/ Consumer Groups	Labour Unions	Professional Organisations
Data Collection	-	University students may collect data (including chemical data) from relevant ministries, agencies, and the community as part of their research.	Collects and stores own data on all aspects of operation.	NGOs and community based organisations collects data through their various programmes such as those related to waste management, environment, nutrition, and health.	-	-
Testing of Chemicals	-	Simple testing through experiments are normally done as part of science subjects and conducted in school laboratories.	Chemicals testing are normally part of routine testing for identification purposes and for quality assurance. The main industries for this purposes would be KOIL, KCMS, and PUB.	-	-	Consultant organisations such as GHD Pty Ltd Group from Melbourne Australia under its contract with MELAD, tested water samples from Kiribati in July 2008.
Risk Assessment	-	-	-	Environmental impact and risk assessments can be provided with the Eco-Care Group, a national environmental consultant body. Other risk assessments are normally provided from external experts e.g. as part of project development proposals.	-	External Consultant groups such as GHD Pty Ltd has worked with MELAD (2008) and included risk assessment studies for hazardous and toxic chemicals on Banaba and Tarawa.

Risk Reduction	-	Safety procedures and policies, and liabilities of universities ensure reduction of risk in chemical management related activities. Staffs are usually informed on these aspects.	To operate to an international standard, industries have safety procedures and policies in place to ensure reduction of risks from harm in the workplace.	Interactive programmes of NGOs with communities and schools e.g. through environmental awareness and voluntary activities contribute to the reduction of risks in life threatening issues e.g. disposal options to reduce chemical pollution of groundwater and adverse effects to health and the environment.	-	-
Policy Analysis	-	Lecturers, tutors, and senior students are often involved in policy analysis in research topics of economics, planning, political, management, and social subjects.	Industries participate in policy analysis through its executive boards.	-	-	-
Training and Education	-	The University of the South Pacific (USP) campus in Kiribati, the Kiribati Technical Institute, and schools in Kiribati provide training and education particularly through the science, engineering and environmental science topics related to chemicals e.g. effects related to air and water pollution, climate change, and health effects.	Personnel can be provided with formal and non-formal training within the workplace or by taking part time courses towards a formal qualification with appropriate higher tertiary institutes such as USP, Kiribati Technical Institute (KTI), or external institutions.	-	-	-

Research on Alternatives	-	-	-	As part of environmental risk analysis, consultants or groups providing the assessment should also provide alternative solutions in order to minimise risks and adverse effects of proposed activities.	-	Technical Assistance programmes contracted to professional organisations such as environmental consultant groups are normally tasked to research and provide alternative solutions to issues of study.
Monitoring	-	-	Monitoring of chemical management related issues are normally done through regular reporting e.g. daily inspection of storage conditions, transportation and distribution, chemical handling, and reports of accidents, etc.	-	-	-
Enforcement	-	-	The industries concerned such as KOIL and KCMS have their own enforcement policies on the safe management of chemicals to reduce risk of accidents or injurious incidences.	-	-	-
Information to Workers	-	-	Workers are well-informed on work conditions and safe operation of equipments and handling of chemicals through orientation programmes, access to relevant operational manuals and information, and regular updates on new information to workers.	-	-	-

			-		
Information to Public	-	-	Access to information is normally provided to the public about existing programmes through distribution of information sheets, websites, and during environment and national days.	-	-

6.4. COMMENTS/ANALYSIS

The theme of the Kiribati Development Plan is 'Enhancing economic growth for sustainable development' which provides for Government's overall policy and vision: "A vibrant economy for the people of Kiribati". Relevant Government's key policy areas and broad strategies related to the management of chemicals also include opportunities for non-government organisations as in the following:

- Development of Human Resource:
    - by raising the standards and quality of education with one of the strategies to improve partnerships with communities and community-based organisations such as churches and increasing awareness of education policies and initiatives
    - by increasing the retention of school students to pursue higher education with strategies which include the establishment of private senior secondary schools; promotion of vocational training centers for early school leavers/dropouts; and improving partnership with communities and community-based organisations
- Economic Growth and Poverty Reduction:
    - by increasing and expanding economic growth with one of the strategies to stimulate and expand the private sector; restoring the replanting of staple food crops (such as breadfruit and swamp taro – *bwabwai*) on the islands; and improving and diversifying the copra industry
    - by minimising the impact of increasing price of imported fuel by further promoting the use of fuel efficient machinery and equipment.
- Health Improvement:
    - by minimising child mortality rate through expansion and promotion of awareness programs on child health
    - reducing maternal mortality rate by expanding awareness on women's specific health issues
    - improving medical clinics on the outer islands.

There is generally lack of awareness amongst communities on the vulnerability particularly of women and children to their harmful exposure to chemicals and related wastes. Different types of chemicals are toxic and have carcinogenic effects at certain levels in humans which can cause harmful effects to reproductive development, Women in particular can pass as much as 20 % of the toxicity in their body to their children both before and after birth that can cause effects such as child deformity. Thus, it is important that future health improvement programs, incorporate awareness raising activities and knowledge improvement particularly of women on proper storage, handling, use, and disposal of chemicals within the home to protect themselves and their families. Improving chemicals management can prevent and/or minimise a woman's risk from chemical contamination, improve and protect maternal health, and thus the health of future generations.

- Environment:
    - protection of island biodiversity including through the encouragement and promotion of community participation, prevention of the introduction of dangerous foreign species, and implementation of the Environment Act and Regulations

    - by minimising and controlling waste and pollution through implementation of the Environment Act and Regulations, and increasing public awareness on proper waste disposal and reducing pollution; and providing support on existing and emerging environmental projects and operations.

Joining national committees such as in the National Chemical Management Committee (NCMC) provides opportunities for NGOs to actively participate in Government's decision-making concerning the management of chemicals. NGOs play an important, active, and effective role in raising awareness and understanding amongst communities or the public on chemical management e.g. by integrating chemical related issues in their programmes, application of appropriate approaches on community education, and by working collaboratively with other NGOs including volunteer groups.

6.5. RECOMMENDATIONS

- Government's key policy areas and broad strategies for development needs to be translated into tangible and effective action plans that also incorporates chemical management elements

- Government to maintain and strengthen the active participation of NGOs through the planning and execution of national development plans including those specifically related to chemicals management, and to encourage NGOs independent operations including their access to internal and external financial support

CHAPTER 7

INTER-MINISTERIAL COMMISSIONS AND COORDINATING MECHANISMS

7.1. INTRODUCTION

An effective management of chemicals requires cooperation and coordination of efforts among ministries, agencies and other relevant government and non-governmental bodies. This chapter provides an overview of mechanisms for coordinating of activities relevant for chemical management in Kiribati.

7.2. INTER-MINISTERIAL COMMISSIONS AND CO-ORDINATING MECHANISMS

Description of the relevant mechanisms for coordinating activities among relevant ministries, agencies, and institutions are provided in Table 7.A. The mechanisms employed are usually the most convenient given the resources available; however, they may not necessarily be the most effective ones.

TABLE 7.A: Overview of Inter-ministerial Commissions and Co-ordinating Mechanisms

Name of Mechanism	**Responsibilities**	**Secretariat**	**Members**	**Legislative Mandate/ Objective**[1]	**Info. Provided in Section 7.3 (yes/no)**	**Effectiveness**[2]
National Coordinating Committees such as the NCMC	Oversee and coordinate program activities	MELAD	10-15	Environment Act 1999 (as amended 2007)	Yes	2
Working Committee	Implementation and monitoring of program outputs	MELAD	7-10	Environment Act 1999 (as amended 2007)	Yes	2

1. Other relevant Acts and Ordinances may also have the legislative mandate for the establishment of coordinating mechanisms
2. Effectiveness uses the following scale: excellent (1), adequate (2) and poor (3)

7.3. DESCRIPTION OF INTER-MINISTERIAL COMMISSIONS AND CO-ORDINATING MECHANISMS

The main coordinating mechanism that have provided for inter-ministerial coordination for chemical management is through a national coordinating committee (NCC) such as the existing National Chemical Management Committee (NCMC). The NCC endorsed by the Minister of MELAD, is chaired by the Senior Responsible Officer, with the Secretariat as the national coordinator for the national chemical projects. Members are nominated from relevant ministry departments, NGOs, and other agencies. The NCC's primary objective is to oversee the implementation and achievements of main activity outputs for chemical management such as a national chemical profile. The NCC is the decision-making body for implementation of a national project, and it also monitors a project's progress including budget and other resources. Decision is usually made as a result of consensus by all members. Meetings are normally held monthly with extra meetings held only if necessary given the circumstances e.g. urgent need for completion of a chemical-related study, or need for urgent approval of a budget for an important activity.

A Working Committee is a sub-committee of the NCC with smaller number of members, normally established by the NCC to undertake specific studies or tasks e.g. drafting of a national chemical profile or organisation of an awareness campaign. The Working Committee normally coordinated by the relevant project coordinator, reports its progress to the NCC.

At the end of an externally funded global chemical programme, the NCC would normally be adopted as the key national coordinating body to continue activities related to the programmes. However, coordination of inter-ministerial commissions such as an NCC has been proved to be a difficult and costly task. For example it requires resources (human, financial, and other logistics) in the organisation of meetings, and time commitment from members whom mostly are already over-committed in their respective work responsibilities. Common difficulties that have been encountered include non-attendance, lateness, lack of full commitment by some members, and delay of meetings due to limitations in funding.

7.4. DESCRIPTION OF MECHANISMS FOR OBTAINING INPUT FROM NON-GOVERNMENT BODIES

The main mechanisms for obtaining input from non-government (NGO) bodies are through their participation in national and working committees such as the NCC. The NCC or other sub-committees provides a platform for NGOs to share information, participate in planning, decision-making and in the implementation of national chemicals management programmes and policies.

7.5. COMMENTS/ANALYSIS

The present coordinating mechanisms described through the coordinating committees are working effectively, however, there are still challenges that require improvements such as in the form of communication e.g. not all members of the coordinating committee have access to an internet required for a more efficient means of communication; the sharing of information e.g. through regular newsletters; capacity enhancement of members i.e. members have different knowledge backgrounds and would benefit and be able to provide more effective inputs to the planning and implementation of a national chemical programme, if given the opportunities for capacity building on the chemical subject matter and other areas relevant for chemical management.

It is often difficult to accommodate all parties from government ministries and agencies which may be able to contribute to the effective implementation of chemical management, in mechanisms used such as the NCC. The difficulty is mainly attributed to the controlled size of such committees and limitations in funding for a larger committee. Because of this limitation, such mechanisms are normally established with members selected from most relevant ministry departments and non-government organisations whose work impacts most on areas covered by the chemical related programme concerned. There are still opportunities however, to bring in additional parties such as through their memberships and participation in sub-committees, or include at times in the main coordinating body (NCC) on a case-by-case basis to assist with specific issues of concern.

Since MELAD has been the main coordinating ministry for chemicals management, it has also taken the responsibility to coordinate, collate, and facilitate the sharing of information across different agencies which have functions related to chemicals management. For example the compiling and updating of this national chemical profile ensures that information is shared among stakeholders and provided via MELAD's Environment and Conservation Division.

7.6. RECOMMENDATIONS

Existing coordinating mechanisms need to be strengthened including improving of communication means and the sharing of information by coordinating committee members, which are important for the effective management of chemicals

Coordinating bodies such as MELAD need to be creative in finding ways to accommodate and improve the participation of various stakeholders including those under-represented in the coordinating committees. This would ensure a more well represented national body and improved planning.

CHAPTER 8

DATA ACCESS AND USE

8.1. INTRODUCTION

Availability of data and information are crucial to facilitate decision making processes often required for an effective management of chemicals. This chapter provides an overview of the availability of data for chemicals management and the related infrastructure, and analyses how information is used for national and local chemical risk reduction.

8.2. AVAILABILITY OF DATA FOR NATIONAL CHEMICALS MANAGEMENT

TABLE 8.A: Quality and Quantity of Available Information

Data Needed for/to:	Pesticides (agricultural, public health and consumer use)	Industrial Chemicals	Consumer Chemicals	Chemical Wastes
Priority Setting	X[1]	X	-	X
Assess Chemicals Impact under Local Conditions	-	-	-	-
Risk Assessment (environment/health)	-	-	-	X
Classification/Labeling	-	-	-	-
Registration	-	-	-	-
Licensing	-	-	-	-
Permitting	-	-	-	-
Risk Reduction Decisions	-	-	-	-
Accidental Preparedness/Response	-	-	-	-
Poisoning Control	-	-	-	-
Emissions Inventories	-	-	-	-
Inspections & Audits (environment/health)	-	-	-	-
Information to workers	X	X	X	
Information to the public	-	X	X	-

1.An "X" denotes that the specific stage of the Category of Chemical is adequately addressed through legislation

8.3. LOCATION OF NATIONAL DATA

TABLE 8.B: Location of National Data

Type of Data	Location(s)	Data Source	Who Has Access?	How to Gain Access	Format
Production Statistics	MFED	Statistics Office	Government Officers and the General Public	Write to Republic Statistician	Automated database
Import Statistics	MFED	Statistics Office Customs Division	Government Officers and the General Public	Write to Republic Statistician and Principal Customs Officer	Automated database
Export Statistics	MFED	Statistics Office Customs Services Division	Government Officers and the General Public	Write to Republic Statistician and Principal Customs Officer	Automated database
Chemical Use Statistics	Not Available	Fragmented in relevant ministries	Government Officers and the General Public	Write to Senior Responsible Officer of relevant ministry	-
Industrial Accident Reports	Not Available	Not Available	Not Available	Not Available	-
Transport Accident Reports	OB	Police Headquarters	Government Officers and the General Public	Write to Commissioner of Police	-
Occupational Health Data (Industrial)	Not Available	Not Available	Not Available	Not Available	-
Poisoning Statistics	MHMS	Statistics Unit	Government Officers and the General Public	Write to Senior Responsible Officer of the MHMS	Automated database
Pollutant Release and Transfer Register	Not Available	Not Available	Not Available	Not Available	-
Hazardous Waste Data	MELAD	Environment & Conservation Division (ECD)	Government Officers and the General Public	Write to Senior Responsible Officer of MELAD	-
Register of Pesticides	MELAD	Agriculture Division	Government Officers and the General Public	Write to Senior Responsible Officer of MELAD	-
Register of Toxic Chemicals	MELAD	ECD	Government Officers and the General Public	Write to Senior Responsible Officer of MELAD	-
Inventory of Existing Chemicals	MELAD	ECD	Government Officers and the General Public	Write to Senior Responsible Officer of	Automated database

				MELAD	
Register of Imports	MFED	Customs Services Division	Government Officers and the General Public	Write to Customs Principal Officer	-
Register of Producers	MCIC		Government Officers and the General Public	Write to Senior Responsible Officer of MCIC	Automated database
PIC Decisions	MFA		Government Officers and the General Public	Write to Senior Responsible Officer of MFA	-

8.4. PROCEDURES FOR COLLECTING AND DISSEMINATING NATIONAL/LOCAL DATA

There is no law to date specific on the collection and dissemination of national and local data. There are however, fragmented legal provisions in some laws e.g. the Environment (Amendment) Act 2007 (s.83) requires that the Principal Environment Officer keep a public register including for applications, licenses, and environment impact assessment reports. However, data related to chemicals management is not specified in the Environment Act.

Government ministries, agencies, and other organisations all collect data and have their own storage system such as through their Registry Unit, Statistics Unit, or Information and Education Units, and Resource Centres. Since there is no specific legal instrument for the management of data, to date data requested within Government and by the general public are readily provided. However, restrictions may apply to foreigners or non I-Kiribati citizens on release of data except when approved by the appropriate Minister and Senior Responsible Officer of the relevant ministry.

Environment and health data on chemicals is available and maintained. Data on environmental effects of some chemicals such as those from petroleum products containing hydrocarbons are available with ECD, however, data on health effects of chemicals are limited as there has not been any study that focuses on this aspect of chemicals.

Confidential business information (CBI) is information not to be disclosed to any other Parties not concerned with the information. Such information is usually kept confidential for the purpose of a business's competitive environment and may include information such as on chemical formulations, manufacturing agents, or expert contacts that gives a business its competitive advantage over other ventures.

TABLE 8.C: Availability of International Literature

Literature	Location(s)	Who Has Access?	How to Gain Access	URLs
Environmental Health Criteria Documents (WHO)	MHMS WHO Country Office	- WHO Staff - Health Officials - MPs - Research Students - Other Government Officers	Contact WHO Country Liaison Officer	http://www.who.int/ipcs/publications/ehc/en/index.html
Health and Safety Guides (WHO)	MHMS	- WHO Staff - Health Officials - MPs - Research Students - Other Government Officers	Contact WHO Country Liaison Officer	http://www.who.int/ipcs/publications/hsg/en/index.html
International Chemical Safety Data Cards (IPCS/EC)	MELAD (ECD, Agriculture) MEYS	- Ministry Officers	Contact Director or Principal Officer of relevant department.	http://www.inchem.org/pages/icsc.html
Decision Guidance Documents for PIC Chemicals (FAO/UNEP)	MELAD (ECD, Agriculture)	- Ministry Officers	Contact Director or Principal Officer of the relevant department.	http://www.pic.int/en/Table7.htm
FAO/WHO Pesticides Safety Data Sheets	MELAD (Agriculture) MHMS (WHO Office)	- Agricultural Officers - WHO Staff and MHMS Staff	Contact Director or Principal Officer of the relevant department.	http://www.who.int/ipcs/publications/pds/en/index.html
Documents from the FAO/WHO Joint Meeting on Pesticide Residues	MHMS WHO Country Office	- MHMS Officers - Government authorized personnel - WHO authorized staff	Contact WHO Country Liaison Officer	http://www.who.int/ipcs/publications/jmpr/en/
Material Safety Data Sheets (industry)	MEYS Kiribati Copra Mill	- MEYS school teachers and laboratory technicians. KCMS Staff	Contact Principal of school or Lab. Technician. Contact Supervising Staff	http://www.msds.com/index.asp http://www.permabond.com/ http://www.3ecompany.com/Industries_Application/chemical_distributors.htm

OECD Guidelines for the Testing of Chemicals	-	-	-	http://www.oecd.org/document/40/0,3343,en_2649_34377_37051368_1_1_1_1,00.html
Good Laboratory Practice Principles	MEYS MHMS Industry (KCMS)	- School science teachers, Lab. Technicians, and science students; - Pathology Lab. Technicians and other hospital Staff; - KCMS Staff	Contact Head of Science Department or Lab. Technician; Pathology Lab. Supervisor; KCMS Supervisor.	http://www.oecd.org/document/63/0,3343,en_2649_34381_2346175_1_1_1_1,00.html
Good Manufacturing Practice Principles				http://www.who.int/medicines/areas/quality_safety/quality_assurance/production/en/index.html
WHO/UNEP Global Env. Library Network	MHMS WHO Country Office MELAD (ECD)	- MHMS, WHO, and ECD (MELAD) authorised Officials; - Information and Resource Centre Staff	- Contact Director or Principal Officer of relevant department.	

8.5. AVAILABILITY OF INTERNATIONAL LITERATURE

The following tables describe the type of international literature and databases that are available and accessible within Kiribati. Awareness of such information and their availability is important to facilitate increase access and sharing of information relevant for the effective management of chemicals.

8.6. AVAILABILITY OF INTERNATIONAL DATABASES

International databases are not available in Kiribati; however, some access to global stations may be possible only through authorised Officers whose work has direct relevance or have been appointed to update country information onto international databases, as part of Kiribati's obligation under international agreements. Due to limited time, identification of ministries or organisations that has access to these databases was not possible.

TABLE 8.D: Availability of International Databases

Database	Location(s)	Who Has Access?	How to Gain Access	URLs
IRPTC	-	-	-	http://www.chem.unep.ch/irptc/irptc/databank.html
ILO CIS	-	-	-	http://www.ilocis.org/
IPCS INTOX	-	-	-	http://www.intox.org/
Chemical Abstract Services Database	-	-	-	http://www.cas.org/
Global Information Network on Chemicals (GINC)	-	-	-	http://www.nihs.go.jp/GINC/
STN Database	-	-	-	http://www.cas.org/products/stnfamily/index.html
Relevant Databases from Other Countries	-	-	-	

8.7. NATIONAL INFORMATION EXCHANGE SYSTEMS

Some national information exchange systems that facilitate information flow from international organisations to all concerned parties in the country include the following:

- distribution of copies of relevant international reports through electronic mail or hard copies
- presentations made to stakeholders on relevant information obtained from international meetings
- relevant international information summarised in newsletters and national papers
- Government circulars containing international information, distributed to concerned parties.

The exchange of national information among various ministries and other institutions and concerned parties is also encouraged through forums such as national committees, working groups, and project committees, where members are representatives from Government ministries, NGOs, institutions, and other organisations. However, information collection and exchange have not always been efficient as there have been issues such as the lack of participation and response from some members and would become a time-consuming process.

8.8. COMMENTS/ANALYSIS

Although relevant literature and information are distributed through some national information exchange systems such as through electronic mails and committees, there are still significant gaps in the current system. For example, representative members from ministries or other organisations may not distribute or fully provide information obtained from the meetings to his/her members as expected; distribution via electronic mails may not reach concerned organisations due to lack of access to the internet by all members; limited number of hard copies due to financial constraints would mean that a significant portion of those concerned with the information may not have direct access. The lack of a central information system such as a national database and resource centre for chemical information that could provide easy access by all interested parties including the public would be the main significant gap in the information distribution system. This also results in some overlapping and duplication of efforts in the storage of chemical management related information.

The present systems of accessing information from different ministries and organisations through personal contact is a very time consuming and costly process and not all information was able to be gathered as required. Very few ministries have well established databases however, most ministries and organisations do not have databases or are still in the process of establishing one, and still some departments and organisations do not have automated systems. Efforts to improve the quality of existing databases are increasingly being addressed e.g. through the use of contemporary including web-based database software that can now be seen by some departments particularly those linking to a global central information centre.

8.9. RECOMMENDATIONS

- To establish a centralised chemical information system that coordinates, collates, and regularly update chemical data and related information such as a national chemical database system

- Data gaps should be addressed by all relevant sectors to improve amount of data and information available and thus their reliability required for national reporting, research, priority setting, and policy development.

- Existing storage of chemical data and information should be improved for more easy access to all stakeholders and the general public. This can be improved by strengthening national data systems, encouraging publication of relevant chemical data from all key stakeholders including in electronic format, and improving mechanisms for their accessibility.

CHAPTER 9

TECHNICAL INFRASTRUCTURE

9.1. INTRODUCTION

Availability of technical infrastructure is important for the management of chemicals. This chapter provides an overview of existing technical infrastructure in Kiribati related to identification and analysis purposes that are useful for the management of chemicals.

9.2. OVERVIEW OF LABORATORY INFRASTRUCTURE

Laboratory infrastructures in Kiribati are limited mainly for health and educational purposes, and are located only within the respective ministries. Environmental testing laboratories are non-existent and health and educational laboratories are currently not equipped or have the capacity to carry out comprehensive chemical analysis required for environmental assessments such as the analysis for heavy metals and heavy chain hydrocarbons.

Even so, workers received training on chemical monitoring and safe disposal of chemicals e.g. KOIL staff were trained in the physical testing of the presence of petroleum in underground water, Laboratory technicians in schools and at the hospitals, Pharmacists and Chemical Stock persons were trained on the safe storage and disposal of chemicals.

Table 9.A: Overview of Laboratory Infrastructure for Regulatory Chemical Analysis

Name/ Description of Laboratory	Location	Equipment/ Analytical Capabilities Available	Accreditation (if yes, by whom?)	CERTIFIED GLP (yes/no)	Purpose
Hospital Laboratory	Tungaru Central Hospital, (Nawerewere, and Betio, Tarawa) and Kiritimati Hospital	Pathological testing equipment e.g. microscope; Electrolyte analyser	-	Yes	Microbiological testing; elements testing of Na^+, K^+, Cl^-, Li^+, Ca^{2+}, and pH, from body fluid samples
Secondary School, University, and Institute Laboratories	Junior Secondary and Senior Secondary schools on all islands in Kiribati, USP	Basic experimental testing equipments	-	Yes	Selected elemental testing

	campus and KTI on South Tarawa				
KOIL Laboratory	Betio, Tarawa	-	-	Yes	Basic petroleum products testing
PUB	Betio, Tarawa	Water testing and Disinfection equipments	-	Yes	Basic water parameters (e.g. pH and salinity) testing and for chlorination
Copra Mill Laboratory	Betio, Tarawa	-	-	Yes	-

Existing laboratories at this stage cannot offer a range of analyses services on many environmental matrices, including drinking water, ground water, landfill leachates, contaminated soil, and effluents. The laboratories are not well equipped to test for metals, organics, nutrients, and other chemicals e.g. metals analysis would require advanced instrumentation such as ICP-MS, ICP-OES, graphite furnace AA, flame AA, and cold vapour AA which also determines mercury. Organics testing would require instruments such as multiple GC-MS, GC-FID, HPLC, ASE extraction, and gel permeation chromatography. The laboratories also currently cannot fully utilise internationally recognised protocols including OECD Test Guidelines.

There are existing cooperation programmes between Kiribati and regional countries such as Fiji, Australia and New Zealand who provides assistance in the sharing of laboratory facilities and conducting of chemical analyses that cannot be done in country. At this stage, no national programmes currently exist to improve the quality and quantity of the laboratories. There is also no existing plan for establishment of an environmental testing laboratory and consideration of one would require a considerable financial commitment by Government. Human Resource development is also needed in this area.

9.3. OVERVIEW OF GOVERNMENT INFORMATION SYSTEMS/COMPUTER CAPABILITIES

Computer systems across ministries and other governmental institutions are generally compatible. Access to the internet and email, however, can only be accessed by few authorised staff in some ministries and government institutions. Most computers do not currently have advanced systems and database capabilities (Table 9.B.).

Table 9.B: Computer Capabilities

Computer System/Database	Location	Equipment available	Current Uses
POPs inventory of chemicals	ECD, MELAD	-	Internet, email, simple databases, local area networking
Other	-	-	-

9.4. OVERVIEW OF TECHNICAL TRAINING AND EDUCATIONAL PROGRAMMES

The importance of the development of human resources and future economic growth is greatly emphasised in the Government's Kiribati Development Plan (2008-2011) document. Government's key policy areas to ensure human resources development are:

- To raise education standards and quality
- To increase retention of school students to continue on to higher education

Training and educational programmes to raise education standards at the tertiary level are implemented by different schemes that are mostly Government and externally funded, such undergraduate scholarships offered through MEYS; postgraduate scholarships through the Public Service Office for public servants; or directly through universities for the general public. Other programmes include shorter term training (few days to few months only) for Government and other organisations' staff that can take place in country or with external institutes or organisations.

Technical expertise required to implement government policies and programmes related to chemical management is limited in Kiribati. Development in this area would require a commitment by Government to allocate a larger portion of funds towards training and education in the science disciplines such as chemistry, toxicology, environmental sciences, and environmental engineering, and also be able to match it with establishment or improvement of infrastructure for application of skills by qualified personnel. Technical training of workers should also be encouraged such as in the effective implementation of occupational safety regulations.

9.5. COMMENTS/ANALYSIS

Existing laboratories in the country are mainly used for health and educational purposes and have been designed and equipped to meet common needs for public health and medical requirements, and to be able to meet at least minimum requirements particularly for the science curriculums.

International cooperation enables the sharing of laboratory facilities particularly for medical testing requirements that cannot be accomplished in the country due to lack of other specialised testing facilities.

Population's health in Kiribati has always been Government's issue and priority, thus implied by the long established health laws and associated infrastructures. Comparatively, the lack of infrastructure and facilities for environmental purposes including for chemical analyses was attributed partially to the fact that the concept of 'environment' was only fairly introduced in Kiribati with the establishment of the Environment Division of about two decades now. The environment laws have also recently being developed (Environment Act 1999) and further amended for improvement. Enforcement of the Act, however, is still difficult and not effective in particularly for chemicals effects.

9.6. RECOMMENDATIONS

Even if chemicals management is presently not a priority with Government, the establishment of proper infrastructure including an environmental analyses laboratory for chemicals testing in environmental systems, needs to be considered now that the effects of chemicals are increasingly becoming evident (see Chapter 3) and are already deteriorating environmentally, culturally, and economically important resources such as coastal, marine and fresh groundwater resources. Improved infrastructure for adequate chemicals management would be possible with the improvement and enforcement of environmental laws and with Government's commitment to environmental protection.

CHAPTER 10

INTERNATIONAL LINKAGES

10.1. INTRODUCTION

This chapter describes Kiribati's participation and involvement in international organisations and agreements concerned with the management of chemicals and identifies opportunities for an integrated approach at the national level.

10.2. CO-OPERATION AND INVOLVEMENT WITH INTERNATIONAL ORGANISATIONS, BODIES AND AGREEMENTS

Kiribati is a party to a number of international treaties, conventions, and agreements (Table 10.A) that would be beneficial to the country and its people. Although as a small island state with limited resources, Kiribati embraces and works on the challenges that come with participation in international agreements e.g. fulfilling obligations of provisions in international agreements. This may involve at the national level on Government's part, the re-allocation of financial, human, and other resources; institutional restructuring, introduction of new laws, and mainstreaming of global programmes into Government's policies and national programmes.

Table 10.A: Membership in International Organisations, Programmes and Bodies

International Organisation/Body/ Activity	National Focal Point (Ministry/Agency & Primary Contact Point)	Other Ministries/ Agencies Involved	Related National Activities
Intergovernmental Forum on Chemical Safety (IFCS)	Senior Responsible Officer, Ministry of Foreign Affairs and Immigration (MFAI)	MELAD (ECD)	National POPs inventory report
UNEP IRPTC-National Correspondent IE/PAC-Cleaner Production Center	Senior Responsible Officer, MFAI	MELAD (ECD)	World Environment and Clean Up Days

IPCS	Senior Responsible Officer, MFAI	MHMS	-
WHO	Senior Responsible Officer, MFAI	MHMS (WHO Country Office)	National Health Days
FAO	Senior Responsible Officer, MFAI	MELAD (Agriculture Division)	Food and Agriculture Days
UNIDO	Senior Responsible Officer, MFAI	MELAD	-
ILO	Senior Responsible Officer, MFAI	MLHRD	National Labour Days
World Bank	Senior Responsible Officer, MFAI	MFED	Kiribati Adaptation Project
Regional Development Bank (specify)	Senior Responsible Officer, MFAI	MFED	-
OECD	Senior Responsible Officer, MFAI	MELAD	-
Regional Economic Commissions (specify)	Senior Responsible Officer, MFAI	MFED	-

Table 10.B: Participation in International Agreements/Procedures Related to Chemicals Management

International Agreements	Primary Responsible Agency	Relevant National Implementation Activities
Agenda 21 – Commission for Sustainable Development	MELAD	National Chemical Profile, Persistent Organic Pollutants (POPs) Project, SAICM project, National Biodiversity Strategy & Action Plan,National Biosafety Framework
UNEP London Guidelines (voluntary procedure)	MELAD	POPs National Implementation Plan
FAO Code of Conduct (voluntary procedure)	MELAD	Pure Food Ordinance Consumer Protection Act
Montreal Protocol	MELAD	-
Basel Convention	MELAD	-
London Convention	MELAD	-
Rotterdam Convention	MELAD	-
Stockholm Convention	MELAD	National Implementation Plan under POPs programme
Strategic Approach to International Chemicals Management	MELAD	Updating of National Chemical Profile, Developing a Capacity Assessment for the Sound Management of Chemicals, National priority settings, through SAICM's Quick Start Programme

GHS	MELAD	-
GATT/WTO agreements (related to chemicals trade)	MCIC	-
ILO Convention 170 and 174	MLHRD	National Labour Days Trade Union national conventions Human Rights Days
UN Recommendation for the Transport of Dangerous Goods	MFAI	Publications of Dangerous Goods Manuals to Transport Sector
Chemicals Weapon Convention	MFAI	Chemical Weapons (Prohibition) Act 2006
Regional/Subregional Agreements (specify)	MFAI	-
Bilateral Agreements (specify)	MFAI	-

10.3. PARTICIPATION IN RELEVANT TECHNICAL ASSISTANCE PROJECTS

Table 10.C: Participation as Recipient in Relevant Technical Assistance Projects

Name of Project	International/ Bi-lateral Donor Agency Involved	National Contact Point	Relevant Activities
Persistent Organic Pollutants (POPs) and National Implementation Plan for Kiribati	UNEP	MELAD	Development of a National Chemical Management Profile
Strategic Approach to International Chemicals Management (SAICM)	UNITAR in collaboration with IOMC SAICM Secretariat/ UNEP	MELAD	Enabling Activities: Updating of a National Chemical Management Profile and National Capacity Assessment for the Sound Management of Chemicals, and National SAICM Priority Setting
Kiribati National Adaptation Plan of Action	UNDP GEF	MFED	Preparation of a draft National Adaptation Plan of Action (NAPA) report
Kiribati National Capacity Self Assessment – Enabling Activity	UNDP GEF	MELAD	Assessments of the current capacity constraints for addressing global and local environmental issues, taking into account Kiribati's obligations under the global conventions on biodiversity, climate change and desertification/degradation.

Kiribati Second National Communication (SNC)	UNDP GEF	MELAD	Stocktaking of needs to identify and validate the critical priorities for UNFCCC implementation in Kiribati.
Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project (PIGGAREP)	SPREP INDP GEF	MPWU	Renewable energy initiatives: - Technical Training project for maintaining renewable energy; - Expansion of the Kiribati Solar Renewable Energy Company (KSEC)
Development of Kiribati National Energy Policy	Pacific Islands Forum Secretariat, SOPAC EDF-9 Regional Technical Facility	MPWU	Development of the Kiribati national energy policy and mainstreaming of energy
Taro Beetle Management (TBM)	SPC EU ACIAR	MELAD	Initiatives for biological control measures for pest management

- Persistent Organic Pollutants (POPs)

The POPs project, initiated under the Stockholm Convention with the support of the Global Environment Facility (GEF) strengthened capacity for the National Implementation Plan (NIP), with an overall objective to reduce, eliminate and substitute POPs gases and promoting the sound management of chemicals. The project was executed at the national level by MELAD and implemented by ECD.

- Strategic Approach to International Chemicals Management (SAICM)

The SAICM Quick Start Programme Trust Fund enabling project provides for the development or updating of a national chemical profile for Kiribati, identifying capacity needs for sound chemicals management, and setting National SAICM priorities. The project runs for approximately for 12 months starting from 2008. Participating ministries and organisations include MELAD, MFED, MHMS, KCMS, KOIL, and KANGO. Key outcomes of the SAICM project would be:

- An updated assessment of the national infrastructure that looked into legal, institutional, administrative, and technical aspects of chemicals management
- National capacity assessment
- SAICM-related priorities for implementation developed through consultative processes
- Strengthened national coordination and dialogue on chemicals safety management involving all concerned stakeholders

- Raised awareness and sharing of information across government ministries and other stakeholders concerned with the sound management of chemicals and implementation of SAICM.

- Kiribati National Adaptation Plan of Action (NAPA)

The Kiribati NAPA builds on the Initial National Communication (INC) to UNFCCC of Kiribati that had identified various sectors that are vulnerable to climate change, their adaptation measures, and local knowledge of stakeholders to identify and implement identified adaptation activities requiring immediate and urgent action. These activities will be integrated within national and local development plans and frameworks, particularly in relation to members of the communities that are most vulnerable to climate change. Participating ministries include MELAD, MFED, OB, MISA, KANGO, and community-based organisations.

- Kiribati National Capacity Self Assessment – Enabling Activity

The overall objective of the Kiribati National Capacity Self Assessment project is to undertake assessment of the current capacity constraints in order to address global and local environmental issues, taking into account Kiribati's obligations under the 3 global conventions on biodiversity, climate change and desertification/degradation. Specific outputs include identification of needs for resource mobilisation strategy, and development of capacity development plans for priority setting.

- Kiribati Second National Communication (SNC)

The primary objective of the SNC project is to conduct needs assessment through consultative and participatory processes and validate the critical priorities for UNFCCC implementation in Kiribati. The project is crucial for preparing the proposal for the SNC to the UNFCCC for a larger project. MELAD is the executing ministry with implementing partners of MFED, MISA, NGOs, and community based organisations.

- Pacific Islands Greenhouse Gas Abatement through Renewable Energy Project (PIGGAREP)

The PIGGAREP project starts in 2008 with its main objective to increase power production from renewable energy sources and to improve the overall policy framework of the energy sector. Activities for Kiribati build on four key initiatives (1) Government of Italy and PIC Cooperation Programme; (2) EU EDF 10; with the main activity to provide training, installation and storage, and Technical Assistance; (3) Solar Energy Company Ltd; installation capacity to be expanded from 250,000 Wp to around 500,000 Wp which include installed systems in homes, schools, and larger buildings; and (4) the UNDP Multi-country Office in Suva, Fiji; through the maintenance of renewable energy systems

fund. The recent activity of PIGGAREP was the stakeholder consultations on the draft Energy Policy held in August 2008.

- Taro Beetle Management (TBM) project

The primary objective of the TBM regional project is to identify integrated approaches to combat taro beetle. Approaches would mainly include the use of natural enemies of pests or biological control, which are not chemical-based pesticides, and are much safer to the environment. The project started in 2002 in other Pacific countries and is now being implemented in Kiribati. The executing agency is MELAD through its Agriculture Division.

10.4. COMMENTS/ANALYSIS

Relative to her size and limited resources, Kiribati has done much in implementing her obligations under international agreements through introduction of new laws, incorporation of provisions into existing laws, and integrating global programme activities into national programmes. However, there is still much to be done to fully and effectively implement international agreements.

The work of some international organisations like WHO has been comprehensively integrated into the national health programme e.g. by incorporating WHO standards and targets into national health programmes.

There is no specific coordination policy on the national level for implementation of international activities and agreements for chemicals management. However, the KDP 2008-2011 has integrated the goals including environmental goals specifically of the Millennium Development Goals (MDGs), the Mauritius Strategy, and the Pacific Plan. The area of chemicals management would be covered under the broader environmental objectives of these international agreements. Chemicals management would be implemented under the Environment Policy coordinated by MELAD. Coordination of chemicals management activities is much easier at the ministry level but has proved to be more difficult to accomplish effectively across sectors.

There are no clear procedures to ensure coordination between ministries/agencies responsible for aid activities for health and environmental protection. Such activities however, through communication and sharing of information such as through national committees, have helped ensured some collaboration between ministries/agencies, NGOs and other organisations.

The common constraints in relation to implementing international agreements are inadequacy of financial support, the limited number of qualified persons in the country to effectively implement certain activities, problems with communication systems, transportation, and inadequate participation by key stakeholders due to over commitments of their time.

10.5. RECOMMENDATIONS

To improve the effectiveness of the implementation of international agreements, the following needs to take effect:

- International chemical related programme activities need to be integrated or mainstreamed into development plans across sector policies and programmes
- Assistance providers (donors) and international executing partners need to better understand local situations which may significantly impact on the implementation of planned activities

- Encourage more local participation in the planning of programme activities and budget to be implemented at the national level
- Provide and expedite the flow of programme funds
- Institutional capacities need to be strengthened (legal, administrative, and technical) and support provided to ministries/agencies implementing international agencies' activities (financial and administrative)
- Human resources in technical areas for chemicals management need to be increased by providing training opportunities to staff and stakeholders and active linkages to other similar external programmes
- Provide transportation, proper equipment, and reliable communication services including effective internet access
- Increase salaries and employment of sufficient staff to man locally implemented projects
- Improve programme sustainability e.g. by shortening timeframe gaps between multiple phase programmes in order to retain experienced and skilled staff, and to maintain the presence of a programme at the national level.

CHAPTER 11

AWARENESS/UNDERSTANDING OF WORKERS AND THE PUBLIC

11.1. INTRODUCTION

Awareness activities on potential risks, safety, and other aspects associated with chemicals is an important component of chemicals management. This chapter provides an overview of the mechanisms available for providing of information to workers and to the public in relation to the potential risks associated with a chemical's life cycle of: production, import, export, handling, use and disposal.

11.2. SUMMARY OF AWARENESS MECHANISMS

The following provides an overview of mechanisms such as legal instruments, programmes, policies and other activities of government, institutions, and non-government organisations that have provided for sharing of information and increasing of public awareness on chemical risks and safety aspects.

11.2.1. Policies and Legal Instruments

Relevant Government policies that promote the increase of awareness and understanding of chemicals risks and management include:

- the development of knowledge and skills by raising the standards and quality of education and would include the science and engineering based subjects addressing chemicals information and applications
- promoting partnerships with community-based organisations on education initiatives
- minimising and controlling waste and pollution by increasing public awareness on proper waste disposal and reducing pollution
- promotion of awareness activities including on child health and women's specific health issues.

Other policies relevant for promoting awareness of chemicals risks and management are captured in laws listed in chapter 6 which include:

- the Environment Act, for protection of the environment and sustainable use of resources
- Chemical Weapons (Prohibition) Act, for the prohibition of deliberate use of toxic chemicals intended to cause harm and death

- The Pure Food ordinance, for protection and ensuring the wholesomeness and purity of food
- Pharmacy and Poisons Ordinance, for controlling the practice of pharmacy and the sale and distribution of drugs and poisons
- Dangerous Drugs Ordinance, for the control of importation, transit, manufacture, sales, distribution, and export of dangerous drugs
- Petroleum Ordinance, for prevention of petroleum products related accidents
- Shipping Ordinance, for the control of sea transportation of dangerous cargoes
- Merchant Shipping Oil Pollution Gilbert Islands Order, for the control of oil pollution
- Customs Act, for the control of importation of dangerous chemicals.

11.2.2. Programmes

Training programmes are offered by institutions such as the Kiribati Technical Institute and those organised by relevant ministries including MELAD enabled through chemical management programmes such as POPs and SAICM activities. These programmes have raised awareness and provided training to national stakeholders consisting of government, institutions, and non-government organisations on the chemical risks and management also covering health and safety issues, and appropriate actions for protection from chronic and acute exposure to hazardous chemicals. These programmes continue to actively involve stakeholders in the progress of these activities towards improving chemical management in Kiribati. Government programmes also include hosting of national days such as environment, health, and labour days, where mass dissemination of information normally takes place from the community to the political level.

Non-government organisations such as the Foundation for the People of the South Pacific (FSP) and Te Itibwerere drama group through their community environmental waste management and education projects have also been actively involved in raising workers and public awareness on a range of environmental issues including chemicals particularly those of POPs, their risks, and management. The work of NGOs in this area includes information provision to communities, civil society groups, and schools through a range of media such as drama, radio, and provision of teacher resources.

11.3. RECOMMENDATIONS

- Increase in awareness activities related to chemicals and their management is strongly recommended across ministries, the private sector, non-government organisations, key stakeholders, and the wider community, to instill chemical understanding and knowledge for informed decisions and effective chemicals management

- Occupational Health and Safety training should be provided to workers who directly deal with chemicals. Employers and other agencies dealing with chemicals should have appropriate guidelines such as operational and safety manuals, index of hazardous/toxic chemical classification, and safe handling, storage, transportation, and disposal procedures. Other appropriate training and/or information including on

"Chemical Emergency, Preparedness, Response, and Follow up" should be provided to all workers and the public visiting areas that stores or uses hazardous chemicals.

- Political support is needed to ensure the effectiveness of awareness efforts for chemicals management, such as through the establishment or strengthening of relevant legal instruments, strengthening enforcement measures, participation in awareness activities, encouraging the work of non-government partners, and committing of resources for promoting the sharing and access of information related to chemicals management to workers and the public

CHAPTER 12

RESOURCES AVAILABLE AND NEEDED FOR CHEMICALS MANAGEMENT

12.1. INTRODUCTION

Availability of resources in terms of human and financial, are fundamental to the effective implementation of activities related to chemicals management. This chapter provides an overview of resources available within Government in relation to the various aspects of chemicals management and analysed resource needs.

12.2. RESOURCES AVAILABLE IN GOVERNMENT MINISTRIES/INSTITUTIONS

Tables 12.A and 12.B provide an overview of resource availability and needs within Government by listing existing resources within ministries, agencies and other institutions for the management of chemicals (Table 12.A), and estimating resources needed by ministries, agencies and other institutions to enable the fulfillment of their responsibilities for chemicals management (Table 12.B).

Table 12.A: Resources Available in Government Ministries/Institutions

Ministry/Agency Concerned	Number of Professional Staff Involved	Type of Expertise Available	Financial Resources Available (per year)
ECD (MELAD)	2	Advisory role in POPs management, chemicals disposal, and contingency plans	-
MHMS	5	Knowledge of chemicals for pharmaceutical and medical use, storage, handling and safe applications	-
Agriculture Division (MELAD)	5	Knowledge and practical experience in storage, handling, use, and safe applications	-
MLHRD	-	-	-
Industry Division (MCIC)	3	Knowledge of chemicals and applications, safe handling and storage	-
Transport Division (MICT)	4	Knowledge, inspection, identification, and safe handling of dangerous goods restricted for air and sea transportation	-
MEYS	3	Academic knowledge of chemicals; storage, handling, and disposal of chemicals	-

AG's Office	2	Advise on legal applications of environment and chemical related laws, and support in review and drafting of legal instruments	-
KCS (MFED)	3	Inspection of cargo manifests; identification of dangerous goods including of chemicals; tax provisions; safe storage.	-
MFA	2	Interpretation of policy requirements of chemical related international agreements; registry of international and regional decisions.	-

12.3. RESOURCES NEEDED BY GOVERNMENT INSTITUTIONS TO FULFIL RESPONSIBILITIES RELATED TO CHEMICALS MANAGEMENT

Table 12.B: Resources Needed by Government Institutions to Fulfil Responsibilities Related to Chemicals Management

Ministry/Agency Concerned	Number/Type of Professional Staff Needed	Training Requirements
ECD (MELAD)	2 Pollution Control Officers	Knowledge and skills on hazardous and toxic waste management and disposal; Public participation skills;
	2 Environmental Inspectors	Monitoring, sample collection and analyses, data collection, collection of chemical pollution evidence, and enforcement measures.
MHMS	1 hospital and medical waste coordinator;	Waste management plan, waste sorting, safe disposal of hazardous, toxic and obsolete chemicals, and infectious waste, occupational safety of incinerator operators, monitoring and maintenance of waste management equipments including incinerators;
	2 Environmental Health Inspectors	Monitoring for chemicals adverse effects on health, collection of samples and analyses, and data storage.
Agriculture Division (MELAD)	2 Pest Control Officers	Knowledge of pesticides and toxic chemicals involved; storage and disposal of obsolete pesticides; testing of pesticides for environmental and health effects; public participation; safe application with minimal effects; and follow up activities for effects of pesticide applications.
	1 Legal Officer	Development and preparation of legal instruments such as Pesticide regulation.
MLHRD	Occupational Health and Safety Officers	Knowledge of occupational health and safety procedures related to chemicals management; coordination and enforcement measures for application to ministries and non-government organisations.
Trade/Commerce Division (MCIC)	Trade Officers	Knowledge of business activities including trade agreements of certain goods such as chemicals;

		coordination of private sector activities involving chemicals particularly those that are hazardous and toxic; training skills to assist the private sector on knowledge and safe trade on chemicals and products.
Industry Division (MCIC)	Industry Officers	Knowledge, safe handling, management, and disposal of industrial chemicals
Transport Division (MICT)	Transport Officer	Knowledge, restriction guidelines and procedures, and safe transportation of chemicals particularly of hazardous and toxic nature.
AG's Office	Legal Officers	Knowledge of Environmental Law and applications; Review and drafting of chemical related policies and legal instruments.
KCS (MFED)	Customs Officers	Knowledge and practical application of import/export procedures, goods inspection, dangerous chemicals identification, handling, and storage.
MFA	Multilateral Environment Agreements (MEAs) Officer	Knowledge and translation of MEAs to Government policies for implementation at the ministries level; coordination of national environmental including chemical related activities of international agreements; development of database for international environment agreements.
MEYS	Occupational and Safety Officer	Safe handling, use, storage, and disposal of obsolete chemicals; training of Laboratory Technicians on chemical management and safe disposal options; determine safer alternative chemicals in place of hazardous/toxic chemicals still used, development of appropriate manuals incorporating management information and procedures of all aspects of chemicals used in schools.
KOIL	Occupational and Safety Officer	Knowledge and application of safety procedures in handling and distribution of petroleum products, development of safety manuals to customers, proper storage, and monitoring activities.

12.4. COMMENTS/ANALYSIS

The various Government ministries and agencies that have responsibilities related to chemicals management are not sufficient to effectively undertake all responsibilities that they are charged with. Available personnel however, have been trying to integrate as much responsibilities related to chemicals management particularly for meeting requirements of international agreements, besides their specific job commitments. Inadequacy of technical capacity to address chemicals management is attributed to the limited number of qualified staff and constraints in financial resources to fully equip ministries to effectively implement chemicals management. Qualified human resources in ministries and agencies, for the safe management of chemicals, such as technicians, legal experts, customs officers, environmental and health inspectors, chemical waste experts, and occupational health and safety officers can therefore be assessed as deficient.

Most of the ministries and agencies listed in Table 12.B. require strengthening, capacity building and human resources training in chemicals management areas identified for each ministry or agency. Some numbers for the type of professional staff needed are provided as estimates only, while it is difficult to assess the right number of staff needed at this stage for other ministries and agencies. However, at least one professional staff is needed for each ministry identified above (Table 12.B) to be able to fulfill responsibilities nationwide related to chemicals management.

12.5. RECOMMENDATIONS

Several strategies should be developed to mobilise sufficient technical and human resources to ensure the sound management of chemicals in the country. These include:

- encouraging the active participation of political leaders in chemical management activities and support in chemical management related projects,
- encouraging technical training and human resource development in science and engineering fields,
- field training of staff charged with inspection, monitoring, and follow up activities for chemicals management,
- Occupational health and safety regulations should be enforced to all workers dealing with chemicals,
- strengthening MEYS through increasing the number of qualified scientists particularly chemistry and environmental science teachers and improving science based curriculums,
- development of facilities and provision of equipments required for monitoring and assessing of chemicals environmental effects,
- encouraging active linkages with international and regional expertise for chemical knowledge and relevant appropriate technology transfer to local counterparts, through in-country training, external work attachments, and participation in chemical related research studies,
- the ongoing provision of resources required for meeting capacity development needs of relevant ministries and agencies, including in the form of financial support and external assistance for technical expertise, and technical training of relevant staff.

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Turner, B. 2008: Strategic Approach to International Chemicals Management (SAICM) Quick Start Programme Trust Fund Project – Developing a SAICM Capacity Assessment presentation. National Chemical Management Profile Review and National SAICM Capacity Assessment Planning Workshop 26 and 29 September, Otintaai Hotel, Tarawa, Kiribati.

ANNEX 1:

Glossary

Chemical	A group of substances forming products including pesticides, fertilisers and other agricultural chemicals; those chemicals used in industrial processes; petroleum products; pharmaceuticals; chemicals on the market for consumer use; and food additives.
Acute effect	Immediate effect or result caused by a single exposure to a toxin e.g. can result in an immediate health crisis. Often if an individual survives this immediate crisis, the effects are reversible.
Agricultural chemical	A chemical used for agricultural purposes to maintain or improve crops and agricultural productivity.
Chemical	Any organic or inorganic substance of a particular molecular identity, including (i) any combination of such substances occurring in whole or in part as a result of a chemical reaction or occurring in nature, and (ii) any element or uncombined radical.
Chemical life-cycle	Aspects of a chemical's life which includes production, import, export, storage, transport, distribution, use, and disposal.
Chronic effect	A long term result of exposure to a toxin; it can be a permanent effect or change caused by a single and acute exposure, or from a continuous, low-level exposure.
Consumer chemicals	Chemicals intended for direct human application or consumption which includes food additives, cosmetics, and pharmaceuticals.
Environment	According to the Kiribati Environment Act (1999) "includes all natural, social and cultural systems and their constituent parts, and the interactions of their constituent parts, including people, communities and economic, aesthetic, culture and social factors.
Environmental Impact Assessment	According to the Kiribati Environment Act (1999) means "the identification, analysis, avoidance and mitigation of environmental and social impacts arising from any proposed development under Part III and the evaluation of the cost effectiveness and environmental consequences of alternative options to the proposed development."
Groundwater	Water held in gravel layers or porous rock below the earth's surface.
Hazardous	Refers to chemicals that are dangerous, including flammables, explosives, irritants, sensitizers, acids, and caustics; Many chemicals are hazardous in high concentrations and are relatively harmless in diluted concentrations. Hazardous substances may not necessarily be toxic.

Hazardous waste	Any material discarded that contain substances known to be toxic, mutagenic, carcinogenic, or teratogenic to humans or other life-forms; ignitable, corrosive, explosive, or highly reactive alone or with other materials.
Hydrocarbon	An organic substance composed of hydrogen and carbon elements. It is the building block of organic substances such as PAH, volatile organic compounds (e.g. benzene, toluene, xylenes)
Industrial chemical	Large scale commercially manufactured chemical compound either organic or inorganic, which may be used directly or make to undergo further transformation in the production of detergents, drugs, fertilizers, perfumes, plastics and other synthetic finished chemical products.
License	An official document issued to enterprises (producers, wholesalers, distributors, importers, exporters, possessors) to allow them to operate dealing with chemicals.
Natural resources	Materials, products, and services supplied by the environment
Particulate matter	Atmospheric aerosols or dispersions, such as dust, ash, soot, lint, smoke, pollen, spores, and other suspended materials including droplets of liquid.
Pesticide	Any chemical that kills, manages, drives out, or changes the behaviour of a pest.
Pesticide residues	Remains of pesticides applied to plants that may have carryover and adverse effects to non-target organisms in terrestrial and aquatic ecosystems.
Petroleum	Also known as crude oil, are energy-rich compounds derived from organic molecules created by living organisms millions of years ago and buried in sediments. Petroleum has varying mixtures of oil, gas, and solid tarlike materials.
Renewable energy	Energy normally replaced or replenished by natural processes e.g. solar, wind, and hydro energy.
Risk assessment	Identification and evaluation of the potential adverse effects of chemicals in the likely potential receiving environment and also to human health.
Toxic	Describes chemicals that are poisonous and react with specific cellular components to kill cells or to alter growth or development in undesirable ways; often harmful, even in dilute concentrations.
Toxic chemicals	Includes heavy metals, inorganic chemicals, and both natural and synthetic organic compounds. Toxic chemicals and elements causing the greatest risk to human health according to the EPA include: benzene, cadmium, carbon tetrachloride, chloroform, chromium, cyanides, dichloromethane, lead, mercury, methyl ethyl

	ketone, methyl isobutyl ketone, nickel, tetrachloroethylene, toluene, trichloroethane, trichloroethylene, and xylene(s).
Waste Oil	Used products primarily derived from petroleum, which include, but are not limited to, fuel oils, motor oils, gear oils, cutting oils, transmission fluids, hydraulic fluids, and dielectric fluids.
Water table	The top layer of the zone of saturation; rise and fall according to the surface landscape and subsurface structure.

ANNEX 2:

List of Chemicals

Table 2A: Inventory of Remaining Chemicals on Tarawa (adapted from "The Kiribati Chemical and Waste Management Advice & Banaba Reconnaissaince Consultancy report (15-29 July 2008)"

Includes metal-based salts, metals and organic chemicals, not suitable for stabilisation or neutralisation, metal-based salts yet to be stabilised, disposal options and weblinks to MSDS.

Chemical Name	Location	Description	Options for disposal	MSDS link
Metal-based salts unsuitable for stabilisation				
Mercury sulphate	KY5 School laboratory storeroom	1 x small bottle, half full 1 x small plastic jar, half full	No options, store safely	http://msds.chem.ox.ac.uk/ME/mercury_II_sulfate.html
Nessler's reagent Mercuric chloride	Agricultural Department Storeroom	1 x 300ml bottle (1.5% weight for volume)	No options, store safely	http://msds.chem.ox.ac.uk/NE/Nesslers_reagent.html
Mercuric sulphate	KY5 School laboratory storeroom	1 x 100mL amber jar (half full)	No options, store safely	http://msds.chem.ox.ac.uk/ME/mercury_II_sulfate.html
Mercurous oxide (black)	KY5 School laboratory storeroom	1x 100mL small bottle (half full)	No options, store safely	http://www.sciencelab.com/xMSDS-Mercuric_oxide-9924619
Mercuric oxide (white)	KY5 School laboratory storeroom	1 x 50mL bottle (half full)	No options, store safely	http://www.sciencelab.com/xMSDS-Mercuric_oxide-9924619
Strontium nitrate	KY5 School	1 x small	No options,	http://msds.chem.ox.ac.uk/ST/strontium_nitrate.html

	laboratory storeroom	bottle, half full	store safely	
Sodium bromide	KY5 School laboratory storeroom	1 x 500gm bottle, half full	No options, store safely	http://msds.chem.ox.ac.uk/SO/sodium_bromide.html
Ammonium thiocyanate	KY5 School laboratory storeroom	1 x 500gm bottle, half full	No options, store safely	http://msds.chem.ox.ac.uk/AM/ammonium_thiocyanate.html
Strontium chloride	KY5 School laboratory storeroom	1 x 500gm plastic bottle, half full	No options, store safely	http://msds.chem.ox.ac.uk/ST/strontium_chloride_hexahydrate.html
Dichromate	KY5 School laboratory storeroom	9 bottles of various sizes and brands.	Reduction to Cr^3 required before stabilisation	http://www.sciencelab.com/xMSDS-Potassium_dichromate-9927404
Sodium nitroprusside $NO_2Fe(CN)_8NO.2H_2O$	Agriculture Department storeroom	1 x 1L bottle	No options, store safely	http://fscimage.fishersci.com/msds/30681.htm
Restrictive poison – Clean Cure, Culcure, Rentokil 30% copper sulphate 28.5% Arsenic pentoxide 32% Sodium dichromate 9.5% Sodium pyroarsenate	Agriculture Department storeroom	65 x 10L white plastic buckets (all half full with powder)	Special reagents required for stabilisation. Until adequately treated store safely in dry environment	http://www.woodtreaters.com/NewAssets/PDF/MSDS-CCA-WT-11-2006.pdf

Red phosphorus	KY5 School laboratory storeroom	1 x 2L amber bottle		http://msds.chem.ox.ac.uk/PH/phosphorus_red.html
Sodium	KY5 School laboratory storeroom	1 x 300mL amber bottle		http://msds.chem.ox.ac.uk/SO/sodium.html
Uranyl acetate	Hospital laboratory			http://www.tedpella.com/msds_html/19481msd.htm
Metal-based salts suitable for stabilisation				
Zinc sulphate	Agricultural Department storeroom	14 x 1Kg plastic jars (unopened)	Should be stabilised	http://msds.chem.ox.ac.uk/ZI/zinc_sulfate_7-hydrate.html http://msds.chem.ox.ac.uk/ZI/zinc_sulfate_monohydrate.html
Manganous sulphate	Agricultural Department storeroom	50 x 1Kg plastic jars (unopened)	Should be stabilised	http://msds.chem.ox.ac.uk/MA/manganous_sulfate_monohydrate.html
Calcium borogluconate	Agricultural Department storeroom	4 x 1L amber bottles	Should be stabilised	http://www.durvet.com/MSDS/155_MSDS.pdf
Yellow sulphur	Agricultural Department storeroom	1 x 1Kg plastic jar 2 x 1.5Kg plastic bags	Should be stabilised	http://msds.chem.ox.ac.uk/SU/sulfur.html
Potassium permanganate	Agricultural Department storeroom KY5 School	2 x 300gm small plastic jar 4 x small glass jars 1 x small amber jar	Should be stabilised	http://www.jtbaker.com/msds/englishhtml/P6005.htm
Ammonium	Agricultural	1 x 50 mL	Should be	http://www.jtbaker.com/msds/englishhtml/a5916.htm

hydroxide	Department storeroom	glass bottle	neutralised and stabilised	
Magnesium chloride solution	Agricultural Department storeroom	3 x 500mL plastic bottles	Should be stabilised	http://www.jtbaker.com/msds/englishhtml/m0156.htm
Sulphuric acid	Agricultural Department storeroom	1 x large amber jar	Should be neutralised then stabilised	http://msds.chem.ox.ac.uk/SU/sulfuric_acid_concentrated.html
Sodium tetraborate	Agricultural Department storeroom	30 x 2Kg plastic jars 1 x 1Kg plastic jars	Should be stabilised	http://msds.chem.ox.ac.uk/SO/sodium_tetraborate.html
Calcium nitrate	Agricultural Department storeroom	1 x large plastic red jar (100mL remaining)	Should be stabilised	http://www.hvchemical.com/msds/cani.htm
Magnesium sulphate	Agricultural Department storeroom	1 x 1Kg plastic bag	Should be stabilised	http://www.jtbaker.com/msds/englishhtml/m0234.htm
Sodium thiosulphate	Agricultural Department storeroom	1 x 500mL plastic jar	Not classified as hazardous, but should be stabilised	http://users.bigpond.net.au/tuscany/deltrex/products/s222.htm
Zinc acetate	Agricultural Department storeroom	1 x 200gm plastic jar	Should be stabilised	http://www.jtbaker.com/msds/englishhtml/z1140.htm
Sodium hydroxide	Agricultural Department storeroom	1 x small jar (10 gm remaining)	Should be neutralised then stabilised	http://www.chem.tamu.edu/class/majors/msdsfiles/msdssodiumhydroxide.htm
Hydrogen peroxide	Agricultural	1 x 2L	Should be	http://www.bu.edu/es/labsafety/ESMSDSs/MSHydPeroxide.html

	Department storeroom	amber bottle 1 x 500mL amber bottle	diluted and disposed to land	
Acetic acid concentrate	Agricultural Department storeroom	1 x 500mL amber bottle	Should be neutralised then stabilised	http://www.bu.edu/es/labsafety/ESMSDSs/MSAcetic.html
Potassium iodide	Agricultural Department storeroom	1 x 500mL amber jar	Should be stabilised	http://www.jtbaker.com/msds/englishhtml/P5906.htm
Magnesium chloride solution	Agricultural Department storeroom	1 x 500mL amber bottle	Should be stabilised	http://www.jtbaker.com/msds/englishhtml/m0156.htm
Injectable iron	Agricultural Department storeroom	1 x 200gm sachet	Should be stabilised	http://www.durvet.com/prods/IRON_381/DetailSheet.html
Potassium hydroxide	Agricultural Department storeroom	1 x 500mL amber	Should be neutralised then stabilised	http://www.jtbaker.com/msds/englishhtml/P5884.htm
Lead acetate	Agriculture Department storeroom	4 x boxes of 3 H_2S indicator	Should be stabilised	http://www.jtbaker.com/msds/englishhtml/l2434.htm
Zinc nitrate	Agriculture Department storeroom	1 x1L amber bottle, pellets	Should be stabilised	http://www.jtbaker.com/msds/englishhtml/z3137.htm
Iron filings	Agriculture Department storeroom	1 x 5Kg cardboard box 1 x 2Kg	Should be stabilised	http://www.sciencestuff.com/msds/C1928.html

		plastic bag		
Ferrous sulphate	Agriculture Department storeroom	1 x 1Kg plastic jar	Should be stabilised	http://www.jtbaker.com/msds/englishhtml/f1802.htm
Soda lime	KY5 School laboratory storeroom	3 x 1L amber	Should be stabilised	http://www.jtbaker.com/msds/englishhtml/s2546.htm
Lime	KY5 School laboratory storeroom	3 x 1L amber	Should be stabilised	http://www.sciencestuff.com/msds/C1450.html
Copper or nickel salt	KY5 School laboratory storeroom	2 x 500ml amber bottle	Should be stabilised	Not applicable
Potassium sulphate	KY5 School laboratory storeroom	1 x small amber jar	Should be stabilised	http://www.jtbaker.com/msds/englishhtml/p6137.htm
Manganese oxide	KY5 School laboratory storeroom	1 x small amber jar	Should be stabilised	http://www.jtbaker.com/msds/englishhtml/m0720.htm
Lead oxide	KY5 School laboratory storeroom	2 x small amber jars	Should be stabilised	http://msds.chem.ox.ac.uk/LE/lead_II_oxide.html
Copper solution	KY5 School laboratory storeroom	1 x small amber jar	Should be stabilised	http://www.jtbaker.com/msds/englishhtml/C5170.htm
Dextrose in sodium chloride	Pharmacy Department Storeroom (at hospital)	1 x 1L amber bottle	Can be disposed of down sewer	This product is not hazardous, based upon the Occupational Safety and Health Administration (OSHA) Hazard Communication 29 CFR 1910.1200, and does not require a Material Safety Data Sheet.
Sodium lactate	Pharmacy	1 x 1L	To landfill	http://www.jtbaker.com/msds/englishhtml/S4226.htm

	Department Storeroom (at hospital)	amber bottle		
Sodium tungstanate	Hospital laboratory		Should be stabilised	http://fscimage.fishersci.com/msds/21741.htm
Acids suitable for neutralisation or stabilisation				
Ortho phosphoric acid	Agricultural Department storeroom Pharmacy Department Storeroom (at hospital)	1 x 500mL plastic jar 1 x 500mL plastic jar	Should be neutralised, then stabilised	http://www.rockemat.com/upc/msds/English/REM079.pdf
Acid	Agricultural Department storeroom	3 x 2L amber bottles 1 x 500mL acid	Should be neutralised then stabilised	Not applicable
Nitric acid	Agricultural Department storeroom Pharmacy Department Storeroom (at hospital)	1 x 2L amber bottle 2 x 2L amber bottles	Should be neutralised then stabilised	http://www.jtbaker.com/msds/englishhtml/n3660.htm
Formic acid	Agricultural Department storeroom	1 x 500mL amber bottle	Should be neutralised then stabilised	http://www.jtbaker.com/msds/englishhtml/f5956.htm

Metals				
Mercury	St Louise School laboratory storeroom KY5 School laboratory store (collected from Moroni school) Environment Department Office	1 x small vegemite jar, approximately 15mL 1 x 500gm bottle Approximately 5mL in old beer bottle (recovered from broken thermometer at hospital)	No options, store safely	https://fscimage.fishersci.com/msds/96252.htm
Organic liquids				
Pyro..... crystals C_6...OH	KY5 School laboratory storeroom	1 bottle, half full, approximately 100gms	No options, store safely	Not applicable
Tetracycline	KY5 School laboratory storeroom	1 x 50mL bottle, half full	No options, store safely	http://www.sciencelab.com/xMSDS-Tetracycline-9925200
....N_2OlC (could be	KY5 School	Approximat	No options,	Not applicable

acetic acid crystals?)	laboratory storeroom	ely 20gms	store safely	
I-octanol	KY5 School laboratory storeroom	1 x amber bottle	No options, store safely	http://www.sciencelab.com/xMSDS-2_Octanol-9927680
Acetamide	KY5 School laboratory storeroom	1 x plastic bottle, 200gms remaining 1 x empty plastic bottle	No options, store safely Should be keep away from water	http://www.sciencelab.com/xMSDS-2_Octanol-9927680
Aniline hydrochloride	KY5 School laboratory storeroom	1 x bottle	No options, store safely	http://www.sciencelab.com/xMSDS-Aniline_hydrochloride-9922943
Ethyl ether	KY5 School laboratory storeroom	1 x amber bottle	No options, store safely.	http://www.sciencelab.com/xMSDS-Ethyl_ether-9927164
Butanone (ethyl methyl keytone)	KY5 School laboratory storeroom	1 x bottle, 50mL remaining	No options, store safely	http://physchem.ox.ac.uk/msds/BU/2-butanone.html
Cinnamaldehyde (cinematic aldehyde)	KY5 School laboratory storeroom	1 x 500mL amber bottle, half full	No options, store safely	http://www.sciencelab.com/xMSDS-trans_Cinnamaldehyde-9923482
4-chlorophenol	KY5 School laboratory storeroom	1 x small amber jar, 30mL remaining	No options, store safely	http://www.sciencelab.com/xMSDS-o_Chlorophenol-9923430
Trimethoprim (with sulphur methox	KY5 School laboratory	1 x plastic 200mL	No options, store safely	http://www.drugbank.ca/drugBank/drugStructureFile/drug_files/msds_sheets/DB00440.pdf

azole)	storeroom	bottle, 100mL remaining		
Organic chlorinated solvents (Various chemicals including chloroform, xylene and toluene)	St Louise	Approximately 10 plastic bottled (unopened)	No options, store safely	See above for various solvents
Isopropal alcohol	Agriculture Department storeroom	1 x 1L amber bottle	No options, store safely	http://physchem.ox.ac.uk/msds/PR/2-propanol.html
Unknown organic solvent	Agriculture Department storeroom	1 x 2L black plastic bottle 2 x 2.5L amber bottles	No options, store safely	Not applicable
Iodine/ethanol solution	Agriculture Department storeroom	1 x 250mL bottle	No options, store safely	http://www.jtbaker.com/msds/englishhtml/i2682.htm
Glycerol	Agricultural Department storeroom	1 x 2L amber bottle	No options, store safely	http://msds.chem.ox.ac.uk/GL/glycerol.html
Etching primer acetone	Agriculture Department storeroom	1 x 500mL tin (50mL remaining)	No options, store safely	http://www.csrdistilleries.com.au/MSDS/Acetone.pdf
Phenol	Pharmacy Department Storeroom (at hospital)	1 x 2L amber bottle	No options. Transfer to hospital lab, store safely	http://msds.chem.ox.ac.uk/PH/phenol.html

o-Touluidine	Pharmacy Department Storeroom (at hospital)	1 x 1L amber bottle	No options, store safely	http://msds.chem.ox.ac.uk/TO/o-toluidine.html
Propanol	Pharmacy Department Storeroom (at hospital)	1 x 2L amber bottle	No options. Transfer to hospital lab, store safely	http://physchem.ox.ac.uk/msds/PR/2-propanol.html
Acetone	Pharmacy Department Storeroom (at hospital)	1 x 1Lbottle	No options, store safely	http://www.csrdistilleries.com.au/MSDS/Acetone.pdf
Diethyl ether	Pharmacy Department Storeroom (at hospital)	1 x 1L amber bottle	No options. Transfer to hospital lab, store safely	http://www.sciencelab.com/xMSDS-Ethyl_ether-9927164
Picric acid	Agriculture Department storeroom	1 x small plastic jar	Potentially explosive. No options, store safely	http://www.sciencelab.com/xMSDS-Picric_acid-9926556
Formic acid (Ameisensaure, 85%)	Agriculture Department storeroom	1 x 40L blue plastic drum	No options, store safely	http://www.sciencelab.com/xMSDS-Formic_acid_85_F_C_C-9924100
Concentrated formaldehyde solution	Agricultural Department storeroom	2 x 1L plastic bottles	No options. Transfer to hospital lab, store safely	http://www.kendon.com.au/Catalogue/MSDS/Industrial/Formaldehyde.htm
Acetic acid	Pharmacy Department Storeroom (at hospital)	1 x 1L amber bottle	Neutralise with coral sand and dispose	http://www.sciencelab.com/xMSDS-Acetic_acid-9922769

Creosol	Pharmacy Department Storeroom (at hospital)	4 x 1L amber bottles	No options. Transfer to hospital lab, store safely	http://www.oxfordchemicals.com/oxford%5Cocweb.nsf/LMSDS/M0300/$File/M0300.pdf?OpenElement
Uric acid	Pharmacy Department Storeroom (at hospital)	1 x 1L amber bottle	No options. Transfer to hospital lab, store safely	http://www.sciencelab.com/xMSDS-Uric_acid-9925393
Xylene sulphur	Pharmacy Department Storeroom (at hospital)	1 x 1L amber bottle	No options. Transfer to hospital lab, store safely	http://www.trconsultinggroup.com/safety/msds/xylene.pdf
Xylene	Hospital laboratory	30L 8 x amber bottles	No options, store safely	http://www.trconsultinggroup.com/safety/msds/xylene.pdf
Other chemicals				
Unknown chemicals	Agriculture Department storeroom	Approx. 20 bottles of unidentifiable and unlabelled chemicals. Packed in an open-top lidded drum.	MELAD undertake consultation with Agriculture staff and check if they know what any of the chemicals are. If so, label them.	Not applicable
Captan	Agricultural Department storeroom	1 x small plastic packet	No options, store safely	http://www.sdix.com/TechSupport/msds/9998027.1.pdf
Yates Zero glyphosphate	Agricultural Department	17 x 200mL plastic	Use it	http://msds.orica.com/pdf/shess-en-cds-010-000000020515.pdf

	storeroom	bottles		
Bacseal pruning paint	Agriculture Department storeroom	2 x 500mL plastic bottles	Use it	http://msds.orica.com/pdf/shess-en-cds-020-000000020899.pdf
Developer and Fixer: RPX-OMAT (spent solution)	Hospital X-ray laboratory	40L produced every week	See comments in report. Store until treated	No specific MSDS. Thiosulphate is main active constituent. MSDS below. http://www.vinvicta.com.au/catalogue/c275/information/SodiumThiosulphateMSDS.pdf
Cyanide and haemoglobin mixture	Hospital laboratory	400L	See comments in report. Store until treated	http://www.clin-tech.co.uk/pdf/61020X.pdf
Drabkin's Reagent	Hospital laboratory		See comments in report. Store until treated	http://www.clin-tech.co.uk/pdf/61020X.pdf
Easyelectrolytes	Hospital laboratory	13L	Treat as infectious waste	Not applicable
Difco selenite broth	Hospital laboratory		Dispose to sewer in small quantities with dilution	http://msds.sourcemedical.com/Docs/Selenite%20Broth.pdf
TB-colour carbol fuchsin	Hospital laboratory		No options, store safely	http://www.sciencelab.com/xMSDS-Carbol_Fuchsin_Kinyoun-9925738

ADDITIONAL LIST OF CHEMICALS

Table 2B and 2C provides additional lists of chemicals available in Kiribati at the time of reporting, besides those provided from POPs chemical management study report (July 2008).

Table 2B: Chemicals Available at the Kiribati Copra Mill Company Ltd

Chemical Name
Alcohol, BHT, Borox, Phenolphthalein soln 1%, Potassium Hydroxide, Soda Ash, Sodium Citrate, Sodium Hydroxide (0.1 M and 0.25 M), Sodium Metasilicate, Sodium Sulphate, Titanium Oxice, Propyl Paraen.

Table 2C: Insecticides Used by the Ministry of Health & Medical Services

Chemical Name	**Quantity**
1. Aqua Resigen (Active Ingredients: 1.4 % Bioallethrine, 10.26 % Permethrine, 9.79 % Pepronyl butoxide, Water)	48 Litres
2. Sand Abate (Active Ingredients: 1 % Thermophos; Inactive Ingredients: 99 % Sand)	100 kg (first order which was already used up), 200 kg (second order which has 190 kg remaining)

ANNEX 3:

Key Individuals and Organisations for Chemical Management

NATIONAL CHEMICAL MANAGEMENT COMMITTEE

Name	Organisation	Contact	
		Tel/Mob.	Email
Teboranga Tioti	MELAD (Chair)	28211	teboranga@melad.gov.ki
Tererei Abete-Reema	MELAD (ECD Director)	28425	tererei.ecd@melad.gov.ki
Farran Redfern	MELAD (SAICM National Coordinator)	28000	farran.ecd@melad.gov.ki
Taulehia Pulefou	MELAD (ECD)	28000	taulehia.ecd@melad.gov.ki
Betarim Rimon	MELAD (Senior Project Officer)	28211	betarimr@yahoo.com
Tooua Bateriki	Kiribati Customs Services	26531	t_bateriki@yahoo.com
Daniel Langley	KOIL Company Ltd (Safety, Health and Environment Facilitator)	26341	shef@coconutwireless.ki
Teretia Tokam Mantaia	Attorney General's Office (Legal Officer)		teretia@legal.gov.ki.
Karawe Teroroko	Kiribati Association of Non Government Organisations (KANGO)	21369	k_teroroko@fanbox.com
Mele Teabo	MEYS - KGV/EBS (Senior Lab. Technician)	28153	
Reeti Takirua	MFED (National Statistics Office)		rt2430@yahoo.com.au
Paul Tekanene	Kiribati Copra Mill Company Ltd		ptekanene@yahoo.com
Ata Binoka	MELAD (Agriculture and Livestock Development)	28108	b_aata@yahoo.com.au
Beia Tiim	MHMS (Senior Environmental Health Officer)	28100	btiim@yahoo.com

Rosemary Tekoaua	MHMS (Pathology)	28100	
Faitele Mika	National Economic Planning Office (NEPO)	21811	mfaitele@hotmail.com
Dako Nating	University of the South Pacific	21085	dako_n@usp.ac.fj
Martin Tofinga	Kiribati Chamber of Commerce (KCC)		iccc08@yahoo.com
Karekeman Teioo	MISA (Clerk, Betio Town Council)	26278	
Tirebwa M	Ministry of Communication, Transport and Tourism Development		ate.mict@gov.ki.

Other members whose names cannot be located at the time of writing of this report include representatives from:

- Public Utilities Board (PUB)
- Ministry of Public Works and Utilities
- Ministry of Commerce, Industry and Cooperatives
- Ministry of Labour and Human Resources Development
- Teinainano Urban Councils (TUC)