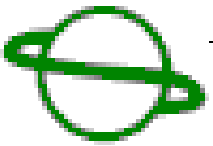
MoE



GEF

UNEP

UNITAR

NATIONAL PROFILE
ON
CHEMICALS MANAGEMENT IN
CAMBODIA

Prepared by: **Enabling Activities for Development of a National Plan for Implementation of the Stockholm Convention**

Funded by: **Global Environment Facility**

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Ministry of Environment

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ABBREVIATION AND ACRONYM

AAS	Atomic Absorption Spectro-Photometer
ADB	Asian Development Bank
APIP	Agricultural Productive Improvement Project
ASEAN	Association of South East Asia Nations
CAAEP	Cambodia-Australia Agricultural Extension Project
CEDAC	Centre Étude et de Development Agricole Cambodgien
CIDA	Canadian International Development Agency
CSARO	Community Sanitation and Recycling Organization
DANIDA	Danish International Development Agent
ESCAP	Economic and Social Commission for Asia and the Pacific
ETAP	Environmental Technical Advisory Programme
FAO	Food and Agriculture Organization
FP	Flame Photometer
GATT	General Agreement on Tariffs and Trade
GC	Gas Chromatography
GEF	Global Environmental Fund
GINC	Global Information Network on Chemicals
GLP	Good Laboratory Practice
GSP	Generalized System of Preference
HPLC	High Performance Liquid Chromatography
ICSDC	International Chemical Safety Data Cards
IFCS	Inter-governmental Forum on Chemical Safety
ILO	International Labor Office
INTOX	Information on Toxic
IPCS	International Programme on Chemical Safety
IPM	Integrated Pest Management
MoE	Ministry of Environment
NAPA	Formulation of the National Adaptation Program of Action to Climate Change
NIP	National Implementation Plan
OECD	Organization for Economic Co-operation and Development
PIC	Prior Informed Consent
POPs	Persistent Organic Pollutants
PTS	Persistent Toxic Substances
RDI	Resource Development International
SP	Spectro-Photometer
STN	Scientific and Technical Information Network
TLC	Thin Layer Chromatography
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNHCR	United Nations High Commission for Refugee
UNICEF	United Nations Children's Fund
UNIDO	United Nations Industrial Development Organization
UNITAR	United Nations Institute for Training and Research
UV	Ultra-Violet Light
WB	World Bank
WHO	World Health Organization
WTO	World Trade Organization

EXECUTIVE SUMMARY

In order to promote social development Cambodia, as well as other developing countries, has significant sectoral economic improvement including agriculture, industry and health. These sectors development activities have demanded high volume of chemicals uses, particularly in the last 10 years. All chemical substances imported have been distributed to different places and different sectoral users. Therefore, the import of chemicals, and the data and information concerning its use, have been maintained at different institutions. Cambodia has no centralized source for chemicals data and information, and currently lacks a national document. The lack of information and data collection has created problems for chemical management in Cambodia, particularly in ensuring technical management to protect public health and maintain a safe environment.

After Cambodia's signing of **the Stockholm Convention on POPs** in May 23, 2001 the country affirmed its full commitment to cooperation with the international community in reducing, eliminating and managing POPs as regulated by the provisions of the convention based on the capacity of the country. Since Cambodia is a least developed country, the Royal Government of Cambodia has received financial assistance from the Global Environment Facility (GEF) through the United Nation Environmental Program (UNEP) for the preparation of the national plan for implementation of the Stockholm Convention, which will be undertaken from 2003 through 2005. The United Nations Environmental Programme suggested that Cambodia should pay attention to chemicals data collection (including POPs) in order to support chemicals management actions for safe public health and environment in the preparation of their national action plan. Cambodia currently has no **National Profile on Chemicals Management.** In response to the reccomendations of UNEP, the Ministry of Environment, with the support from main line ministries have prepared this national profile under supervision from the National Consultant and technical consultation provided by the United Nations Institute for Training and Research (UNITAR). This action is considered part of the project preparation towards a national plan to implement the Stockholm Convention.

The **National Profile on Chemicals Management** was prepared using existing data and information from governmental institutions and civil organizations related to the use and management of chemicals. Data and information have been collected and compiled in this profile to describe each stage of chemicals life cycle covering production, packaging, transportation, distribution, stock, use, and disposal or destruction. This profile provides an overview of existing legal instruments and mechanisms for managing chemicals, technical infrastructure for managing chemicals, and the nature of problems associated with chemicals.

Prior to the drafting of the National Profile on Chemicals Management there was no specification of chemical import information and data. Cambodia imports a lot of chemicals for local demands, which is classified by group such as agricultural chemical fertilizers, pesticides, industrial chemical raw materials, etc. Despite the fact that Cambodia is unlikely to become an industrial chemicals producer, Cambodia's chemical waste has been generated from industrial production and a wide range of chemicals uses. On the other hand, Cambodia has high potential to generate unintentional POPs by-products such as dioxins and furans.

For management purposes, Cambodia paid great attention to permission processes for the import and use of chemicals through the regulation of chemical substances restricted for use, and banned chemical substances for use. Cambodia has legal instruments that regulate the management of chemical substances such as chemicals fertilizers and pesticides, chemicals raw material for industrial production, narcotics, etc. Due to a lack of data and information collection systems, governmental institutions were faced with insufficient data and information to manage chemicals effectively, and to control the amount of chemicals for import, distribution, use, and disposal.

Moreover, Cambodia has adequate implementation mechanisms among 7 main ministries for managing chemicals with the role and responsibility determined by the governmental ordinance (sub-decree) including: Ministry of Agriculture Forestry and Fisheries, Ministry of Commerce (Department of CAMCONTROL), Ministry of Economic and Finance (Office of Customs and Excise), Ministry of Environment, Ministry of Industry Mines and Energy, Ministry of Health, Ministry of Interior (National Authority for Controlling Drugs). Related to managing chemicals, the Royal Government of Cambodia has developed three inter-ministerial committees for facilitating and assisting the line ministries. These are the:

1. Inter-Ministerial Committee for the Management of Quality and Safety of Products and Services.
2. Inter-Ministerial Technical Committee for Industrial Standard.
3. Inter-Ministerial Steering Committee In charge of Facilitation and Implementation of the Basel, Vienna, and Stockholm Conventions.

The above inter-ministerial committees have the role to develop and propose national policy and facilitate the enforcement and implementation of the international conventions and protocols related to chemicals management. In practice, these roles and responsibilities contain some gaps, such as a lack of an institutional capacity, human resource, and facility for chemicals analyzing in particular caused very limited data and information reliable.

Of the above governmental institutions, the management of chemicals has involved the participation of civil organizations such as the private sector, NGOs, research groups and other national institutes. Stakeholder groups actively support national efforts to manage chemicals, and the aims to improve the sectors' environmental performance in the safe use and disposal of chemicals to protect people's health and the environment. However, stakeholder participation is limited and focused only on education and information dissemination.

Cambodia also faces parallel problems regarding human capacities, experience, legal framework, and facilities and mechanisms for managing chemicals and information dissemination. Current problems include:

- Low level chemical awareness on the part of workers, farmers and public at large who are directly using chemicals due to limited education;
- Cambodian peoples preference for the long-term use of chemicals throughout the country has created direct impacts on users, non-users, and the local environment;
- Cambodia has no accidental data and information for accidents caused by the misuse / wrong-use of chemicals;
- Governmental institutions do not have sufficient ability for chemicals assessment and the identification of chemicals-related problems in the production, trade, storage, use, and disposal of such chemicals. This is because Cambodia does not have a clear chemicals management goal coupled with a limited capacity for assessing chemical hazards and identifying their impacts;
- Cambodia has a lack of good cooperation among laboratories and stakeholders responsible for managing emission sources of the chemicals and persistent toxic substances, lack of human resources in operating lab as well as technical expertise related to chemicals analysis and management capacity, and lack of reliable laboratories and equipment for chemicals monitoring and analyzing; and

The governmental mechanism for information exchange, as well as relevant organizations for chemicals management, has not been operating smoothly in response to current requirements.

CHAPTER 1
NATIONAL BACKGROUND INFORMATION

This chapter provides general background information on the Kingdom of Cambodia in relation to chemicals management in the context of physical, political, demographic, socio-economic, industrial and agricultural characteristics of the country.

1.1 PHYSICAL AND DEMOGRAPHIC CONTEXT

PHYSICAL GEOGRAPHY

✦ ***Size of the Country***

- Total Area: 181,035 Km^2
- Water Area: 4,520 Km^2
- Length from East to West: 550 Km
- Width from North to South: 440 Km
- Coastline: 435 Km (On the Southwest, along the Gulf of Thailand)

✦ ***Climate***

Cambodian climate is tropical monsoon with pronounced WET and DRY seasons. During the wet season from May until October, rainfall is largely derived from the Southwest monsoon drawn landward from the Indian Ocean. The dry season, from November to April, is associated with the Northeast monsoon which brings in cooler air.

✦ ***Rainfall***

Most of Cambodia can be described as sub-humid according to the inter-tropical zone (lowland, mountain, and plateau) with the seasonal variation from year to year. The wet season accounts for 80% of the annual rainfall. The average annual rainfall varies across the country between 1,000-2,500mm. Rainfall in the central area covering the Tonle Sap Basin-Lower Mekong valley averages between 1,200-3,000mm. The heaviest rainfall – over 3,000mm per year – occurs along the coastal lowland in the west. From the latter part of July and earlier part of June there may be period without significant rainfall for ten or fifteen days.

✦ ***Winds***

In Cambodia, mean wind speeds are approximately 2m/s average for much of the country. From February to April, there are strong winds from the Southeast and this leads to relatively strong winds in Southern Cambodia. From August to October general turbulence in the upper layer leads to unstable conditions across the countries of Southeast Asia. In November to January, the wind moves to the Northeast and sometimes leads to a strong steady wind.

✦ ***Temperature***

Mean monthly temperature ranges from a minimum of 25^0C in January to 29^0C in April. There is a little spatial variation in temperatures. Temperatures higher than 32^0C are common and just before the start of the rainy season and they many rise to more than 38^0C; the temperature is rarely below 10^0C. Relative humidities range from 65-70% in January and February to 85-90% in August and September. Average annual evaporation ranges from 2,000mm to 2,200mm, being highest in March and April at 200mm to 240mm and lowest in September-October at 120mm to 150mm.

NATIONAL POLITICAL REGIME

Cambodia is a country holding the Constitutional Monarchy with three supreme institutions: a Parliament, Royal Government, and Judicatory. The Cambodian parliament is composed of 2 houses, which are also called the National Assembly and the Senate. Draft laws require adoption by both houses before they become laws.

✦ ***Senate***

An amendment of the Constitution led to the establishment of the Senate as a body empowered with legislative power after the 1998 general election. Within a one-month period, the Senate reviews and makes recommendations on draft or proposed legislations initially adopted by the National Assembly. When a draft is marked as urgent, the review period is reduced to five days after first approval of the national assembly. Senate members have the right to initiate legislation. The Senate has other roles to provide coordination between the National Assembly and the Government.

The Senate consists of 61 members. The Senate Chairman is assisted by 2 Vice Chairmen. The Senate meets twice a year with each session lasting for three months. When needed, the Senate can call an extraordinary session. The first term of the Senate expired in 2004 but was extended for one year, after which Senators will be selected for another six-year term.

✦ ***National Assembly***

According to the Constitution, the National Assembly is elected for five years and can be dissolved only under very specific circumstances, i.e. if on two occasions in twelve months, the Government has been a minority.

The National Assembly consists of 123 members (for the third mandate) all of whom are elected by universal election, through a free, equal, direct and secret ballot. They may stand for re-election.

The ordinary session of the National Assembly is held twice per year with each session lasting at least three months. If there is a proposal from the King, the Prime Minister or one-third of the members, the Permanent Committee can call for an extraordinary session. In between sessions, the Permanent Committee manages the work of the assembly.

The National Assembly approves the national budget and state planning, authorizes the government to borrow and to lend, and is empowered to create, amend or annul taxes. It approves or annuls international conventions or protocols. The adoption of the above mentioned laws must be decided by a simple majority of all members.

✦ ***Royal Government of Cambodia***

The Royal Government of Cambodia (RGC) is the executive organ of the State led by Prime Minister. The RGC, governs the State and is in charge of the overall national policies and programs implementation, and is accountable to the Parliament. The Prime Minister is assisted by deputy Prime Ministers, Senior Ministers, Ministers and Secretaries of State, most of who are in charge of a separate ministry. The following Governmental Institutions required for those above positions are:

1. Office of the Council Ministers
2. Ministry of Agriculture Forestry and Fisheries
3. Ministry of Commerce
4. Ministry of Culture and Fine Art
5. Ministry of Economic and Finance
6. Ministry of Education Youth and Sports
7. Ministry of Environment
8. Ministry of Foreign Affairs and International Cooperation
9. Ministry of Health
10. Ministry of Industry, Mines and Energy
11. Ministry of Information
12. Ministry of Interior
13. Ministry of Justice
14. Ministry of Land Management, Urban Planning and Construction
15. Ministry of Labor and Vocational Training
16. Ministry of National Defense
17. Ministry of Parliamentary Affairs and Inspection
18. Ministry of Planning

19. Ministry of Post and Telecommunication
20. Ministry of Public Works and Transport
21. Ministry of Religions and Cults
22. Ministry of Rural Development
23. Ministry of Social Affairs and Youth Rehabilitation
24. Ministry of Tourism
25. Ministry of Water Resource and Meteorology
26. Ministry of Women Affairs and Veteran
27. Secretariat of Public Service
28. Secretariat of Civil Aviation

✦ ***Judicatory***

The judicial power is independent with guarantees by the King and with the assistance of the Supreme Council of Magistrate. There is no other power that has the authority to apply the judicial power, only the judge can make decisions or judgments. The highest decision is held by the Supreme Court, and covers any court sections and levels, as well as all kinds of cases including administrative cases. Under the law on the organizing and functioning of the Supreme Council of Magistrate, only the Supreme Council of Magistrate can make a decision to penalize a judge for making any wrong actions.

In addition, through the independence of the Judiciary, the judge must decide in complete impartiality, on the basis of facts that are presented, and in accordance with the law, refusing any pressure, threat or intimidation, direct or indirect, from any of the parties to a proceeding or any other person.

ETHNICITY, LANGUAGE AND RELIGION

The population consists of 90% Khmer, 10% Chinese, Vietnamese and smaller numbers of Chams, Burmese, and hill tribes. The majority of the inhabitants of Cambodia are Khmer, who are settled in fairly permanent villages near the major bodies of water in the Tonle Sap Basin-Mekong Lowlands region. They earn a living based on rice field production, farming, fishing, and in the central towns and cities Khmer people earn a living based on businesses, as construction workers, factories workers, etc.

The permanently settled Cham villages are usually located on or near the banks of a river or other bodies of water. They trade fish to local Khmer for rice. The women in these villages earn money by weaving. The Chams who live on land support themselves by various means, depending on the villages. Some villages specialize in metalworking, while others raise fruit trees or vegetables. The Chams often serve as butchers of cattle for their Khmer Buddhist neighbors and are, in some areas, regarded as skillful water buffalo and ram breeders.

The Chinese in Cambodia form the country's largest ethnic minority. Sixty percent of the Chinese are urban dwellers, engaged mainly in commerce, while the other 40% are rural residents working as shopkeepers, as buyers and processors of rice, palm sugar, fruit, and fish, and as money lenders. The Chinese in Cambodia represent five major linguistic groups, the largest of which is the Teochiu, followed by the Cantonese, the Hokkien, the Hakka, and the Hainanese.

The Vietnamese community is scattered throughout Southeastern and Central Cambodia. They are concentrated in Phnom Penh, and in Kandal, Prey Veng, and Kampong Cham provinces, a substantial number live along the lower Mekong and Bassac rivers as well as on the shores of the Tonle Sap, where they engage in fishing. No close cultural or religious ties exist between Cambodia and Viet Nam.

The Khmer Loeu indigenous ethnic groups are found mainly in the Northeastern provinces of Ratanakiri, Stung Treng, Mondulkiri and Kratie. Most Khmer Loeu live in scattered temporary villages that have only a few hundred inhabitants. These villages usually are governed by a council of local elders or by a village headman. The Khmer Loeu cultivate a wide variety of plants, but the main crop is dry or upland rice grown by the slash-and-burn method; hunting, fishing, and gathering supplement the cultivated vegetable foods in the Khmer Loeu diet. Houses vary from huge multi-family longhouses to small single-family structures. The major Khmer Loeu groups in Cambodia are the Kuy, Phnong, Stieng, Brao, Pear, Jarai, and Rade. All but the

last two speak Mon-Khmer languages. About 160,000 Kuy currently live in the Northern Cambodian provinces of Kampong Thom, Preah Vihear, and Steung Treng as well as in adjacent Thailand.

Theravada Buddhism is the predominant religion of Cambodia, and virtually all Khmers are Buddhists. Cambodians are religiously tolerant and a number of other religions are freely practiced. Christianity is practiced by various ethnic groups, especially the Vietnamese, and Islam is the main religion of the Chams.

Khmer is the country's official language. It is spoken by more than 95% of the population. French is also spoken mostly by older Cambodians. English is commonly spoken by the younger generation. The majority of Cambodians, even those who are not ethnic Khmer, speak Khmer. Ethnic Khmer living in Thailand, Vietnam, and Laos speak dialects of Khmer that are more or less intelligible to Khmer speakers from Cambodia. Minority languages include Vietnamese, Cham, several dialects of Chinese, and the languages of the various hill tribes. Generally speaking, Khmer has nouns, verbs, adverbs, and various kinds of words called particles. The normal word order is subject-verb-object. Khmer uses Sanskrit and Pali roots, but for some scientific language it often uses English or French terms. Khmer has also borrowed terms – especially financial, commercial, and cooking terms from Chinese, French, and English. These latter borrowings have been in the realm of material culture, especially names for items of modern Western technology. The language has symbols for thirty-three consonants (twenty in the "A" series and thirteen in the "O" series consonants), twenty-four dependent vowels, twelve independent vowels (not very popular in use for this era), and several diacritics.

DEMOGRAPHY

Based on the 2003 national statistical year book published by the National Institute of Statistics, the Ministry of Planning, the population of Cambodia in 2003 is 13.8 million, of which 52% are females, and growing at an estimated rate of 2.5% per annum. Around 84% of the population lived in rural areas and 16% of the population lived in urban areas. Phnom Penh has an estimated population of 1.2 million and an annual rate of growth 3.5%. Regionally, the distribution of the population is highly skewed towards six provinces located in the central plains and around the capital, which contain close to 60% of the total population. The projected demography data in 2001 have been used for the projected demography detailed data in 2003.

✦ ***TOTAL POPULATION***	***BOTH SEXES***	***MALES***	***FEMALES***
Total	**13,099,472**	**6,348,112**	**6,751,360**
Urban	2, 095,135	1,029,405	1,065,730
Rural	11,004,337	5,318,707	5,685,630
Percentage		48.2%	51.8%

- Annual population growth rate (percent**)** 2.5%
- Birth Rate: 38 per 1000
- Crude Death Rate 12 per 1000
- Total number of households 2,188,663
    - Urban 322,246
    - Rural 1,866,417
- Number of normal or regular households 2,162,086
- Percentage of female headed households 25.7%

- Density of population per 76 Persons/ Km^2

✦ ***Phnom Penh Population :*** 9%

✦ ***Urban Population:*** 7%

✦ ***Rural Population :*** 84%

✦ ***Average Age of the Population:***

- 58.6 years for women
- 50.3 years for men

✦ ***Population of Working Age***

- Percentage of population by age group
  - Children (0-14) 42.8 %
  - Economically productive age group (15-64) 53.7 %
  - The elderly population (65+) 3.5 %

✦ ***Marital status of population aged 15 and over (%)***

SEX	*NEVER MARRIED*	*MARRIED*	*WIDOWED*	*DIVORCED*	*SEPERATED*
Both sexes	29.4	61.3	6.5	2.4	0.4
Males	32.8	64.6	1.6	0.8	0.2
Females	26.6	58.4	10.8	3.7	0.5

Mean age at marriage

Males	24.2
Females	22.5

✦ ***Life Expectancy:*** 53.4 Years at Birth

✦ ***Literacy Rate:*** 65%(1998)

✦ ***Adult literacy rate*** *(percentage of literate persons aged 15 and over)*

TOTAL/URBAN/RURAL	*BOTH SEXES*	*MALES*	*FEMALES*
Total	67.3	79.5	57.0
Urban	79.1	88.2	70.8
Rural	64.9	77.6	54.3

✦ ***Average Education Level of Population:*** *(Educational levels completed by literate persons aged 25 years and over)*

EDUCATIONAL LEVEL	*BOTH SEXES*	*MALES*	*FEMALES*

No educational Level	2.1	2.0	2.2
Primary not completed	56.6	49.0	66.1
Lower Secondary	11.8	13.9	9.2
Beyond and Secondary	0.8	1.1	0.4

- ***Unemployment Rate:***
  - Females Unemployment Rate: 5.9%
  - Males Unemployment Rate: 4.7%
- ***Total Number of Economically Persons:*** 6.4 Million (2002)

Crude economic activity rate or participation rate (percentage of economically active persons among population aged 7 and over)

- Both Sexes 55.5%
- Males 56.5%
- Females 54.6%
- Percentage of population by industrial sector
  - Primary (Small Industry) 77.5 %
  - Secondary (Medium Industry) 4.3 %
  - Tertiary (Large Industry) 18.2 %

ECONOMY

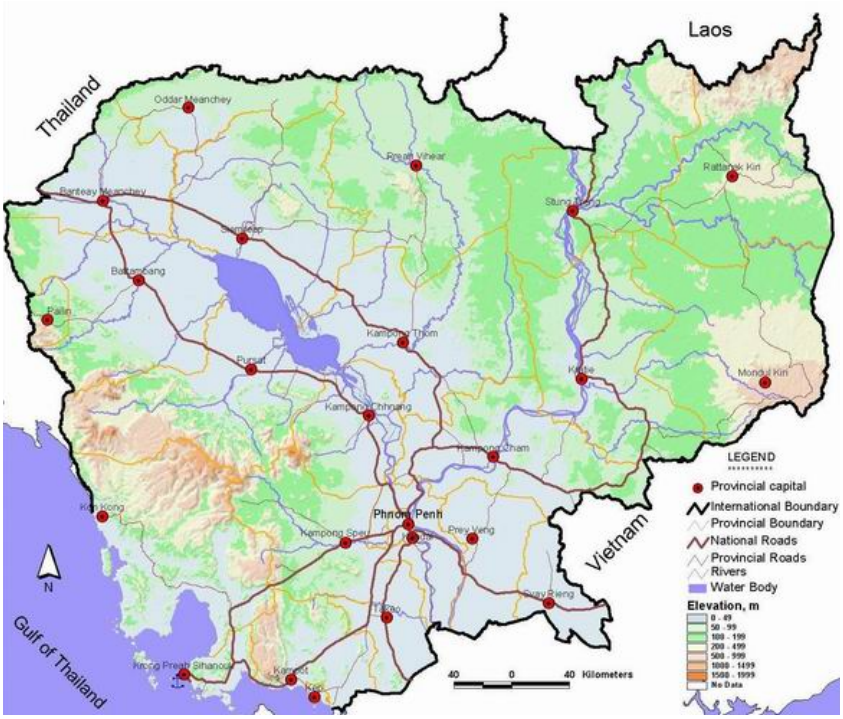
Year	**2000**	**2001**	**2002**	**2003**
Gross Domestic Product: (Million US$)	2,480	2,592	2,721	2,888
Gross Domestic Product: (US$/Capita)	261	259	295	317
Annual Economical Growth Rate (%):	7.7	6.3	5.0	6.0

- Percentage of households having electricity as main source of light
  - Total 15.1 %
  - Urban 53.6 %
  - Rural 8.6 5
- Percentage of households by main type of fuel used for cooking
  - Firewood 90.0 %

- Charcoal 5.3 %
- Kerosene 1.8 %
- LPG 1.7 %
- Others 1.2 %

1.2 POLITICAL/GEOGRAPHIC STRUCTURE OF THE COUNTRY

Cambodia is located in Southeast Asia between 8 and 12 decrees latitude North and 102 and 108 degrees longitude East. Cambodia shares its 2,428 kilometers land border with Thailand on the Northwest and West, Laos on the North and Northeast and Vietnam on the East and South.



Source: NAPA Project (2003)

Based on the National Election Commission' Statistic 2003, the political and administrative organizational structure of the Kingdom of Cambodia is distributed into Municipality, Province, District, Commune, and Village as follows:

- Number of provinces / municipalities 24
- Number of districts 185
- Number of communes 1, 621
- Number of villages 12,738

1.3 AGRICUTURAL AND INDUSTRIAL SECTORS IN CAMBODIA

1.3.1 Agricultural Sector

Cambodia is an agricultural economy. Between 80% and 85% of the labor force is engaged in agriculture and related sub-sectors of fisheries, animal husbandry, and hunting, which contribute to about half of the country's

GDP. Cambodia's main agricultural crop is rice. It is grown on over 90% of the currently cropped area. The second most important crops are rubber, maize, soybeans, mungbean, pepper, and tobacco, etc. Two main types of farming systems can be distinguished: rice-based systems and multi-cropping systems. Different major rice growing systems exist in Cambodia: rain fed lowland rice system, dry season flood recession rice system, floating rice system, dry season lowland irrigated rice system, and upland rice system. Multi-cropping systems predominate among the agricultural systems near the Mekong River – the upland brown and red soils systems, the black clay systems and the slash-and-burn systems.

The agricultural sector has much potential and provides the basis for the country's development. The principal goals of the government in the agricultural sector are the following: to ensure available food at both the national and household levels; to produce surpluses for export; to expand rubber production for increased foreign exchange earnings; to encourage the production of raw materials for local agro-industries; and to improve the well-being and income of the rural population.

According to various research studies by non-government organizations, agriculture production estimates produced by MAFF underestimate crops and livestock production by around 5.1 %; and fish production by around 20%. For more detailed statistics, readers should refer to the annual MAFF *Agriculture Statistics Bulletin* and the annual *Fisheries Statistics Bulletin*.

Crops Production

Most farmers in Cambodia practice subsistence agriculture. This form of agricultural production provides enough food to feed oneself and one's family, with little left over to sell to make an income or to keep for times when crops fail.

Rice is a main crop production comprising 88% of the total crop values in 2002 (refer to Table 1.2). Economically, rubber, maize, and cassava cultivation has been the most important non-rice crops in the past recent years.

Agricultural production and area is shown in the following tables:

Table 1-1: Crops Production and Area from 2000-2002

Products	Area (ha)			Production (tons)		
	2000	2001	2002	2000	2001	2002
Rice	2,318,495	2,240,917	2,137,125	4,026,092	4,099,016	3,822,509
Maize	71,462	80,215	80,470	156,972	185,589	148,897
Yellow Maize	44,347	55,147	54,657	121,741	157,652	117,344
Cassava	16,279	14,239	19,563	147,763	142,262	122,014
Sweet Potato	7,435	7,225	8,136	28,178	26,252	31,530
Vegetable	32,755	35,311	34,433	195,894	184,640	143,175
Mung Bean	24,991	29,431	39,802	15,100	17,153	23,925
Pea Nut	10,370	11,913	13,840	7,490	8,913	9,738
Soya Bean	33,256	31,997	33,613	28,111	24,658	38,801
Sugar Cane	7,723	7,854	9,473	164,176	169,302	208,819
Sesame	19,222	20,158	20,852	9,855	8,957	10,157
Tobacco	9,678	8,554	4,078	7,665	4,662	2,501
Jute	208	203	485	180	203	636
Total	2,596,221	2,543,164	2,456,527	4,909,217	5,029,259	4,680,046

Source: Annual Conference Report, Ministry of Agriculture, Forestry and Fisheries, 2003

Table 1-2 Structures of the Agronomy Sector (2002*)*

Product	Quantity (tons)	Estimated value (US$)	Percentage of total value (%)
Rice	3,822,509.00	1,666,221,872.00	87.56
Crop	543,285.00	292,538,076.90	12.44
TOTAL	4,365,794.00	1,958,759,948.90	100.00

Source: Annual Conference Report, Ministry Of Agriculture, Forestry and Fisheries, 2003

Livestock and Poultry Production

Cambodia has a few commerical agro-business farms for animal husbandry. Livestock and poultry production are operated at the family level. This kind of production improves local supply and provides meat as nutrition for oneself and one's family, with a little left over to sell to make an income for the family. A few research and breeding stations have been established for research and demonstration purposes.

Table 1-3: Livestock and Poultry Production From 2000-2002

Products	Production (heads)		
	2000	2001	2002
Cattle	2,992,640.00	2,868,827.00	2,924,457.00
Buffalo	693,631.00	626,016.00	625,912.00
Pig	1,933,930.00	2,114,524.00	2,105,435.00
Poultry	15,249,201.00	15,249,447.00	16,677,864.00
Total	20,869,402.00	20,858,814.00	22,333,668.00

Source: Annual Conference Report, Agriculture, Forestry and Fisheries, 2003

Table 1-4: Structures of the Livestock and Poultry Sector (2002)

Product	Quantity (heads)	Estimated Value (US$)	Percentage of Value (%)
Cattle	2,924,457	584,891,400.00	75.72
Buffalo	625,912	93,886,800.00	12.15
Pig	2,105,435	73,690,225.00	9.54
Poultry	16,677,864	20,013,436.80	2.59
TOTAL	22,333,668.00	772,481,861.80	100.00

Source: Annual Conference Report, Ministry of Agriculture, Forestry and Fisheries, 2003

Fish and Fish Production

According to official estimates, the fish catch decreased from 444,500 tons in 2000 to 424,400 tons in 2002. The total inland fish catch for Cambodia in 2002 was 360,300 tons, down 6.4% compared to 385,000 tons in 2000. In general, the inland fish catch has decreased from 1999 onwards due to significant changes including overexploitation, illegal fishing gear used, environmental quality degradation, etc. Marine fish catch increased 9.2% from 42,000 tons in 2000 to 45,850 tons in 2002. Sihanouk Ville and Koh Kong fishing grounds continue to account for most of the fish catch.

The Royal Government of Cambodia decided to reduce 39.3% of fishing lots, from 270 to 164 of fishery concessions, aiming to conserve fish species and increase natural fish stock.

Aquaculture fish production increased slightly from 17,500 tons in 2000 to 18,250 tons in 2002. Estimated processed fish production decreased 16.0% from 63,000 tons in 2000 to 52,900 tons in 2002.

Table 1-5: Fisheries Production From 2000-2002

Products	Production (tons)		
	2000	2001	2002
Inland Fishery Capture	385,000	345,000.00	360,300.00
Marine Fishery Capture	42,000.00	40,000.00	45,850.00
Aquaculture	17,500.00	30,500.00	18,250.00
Total	444,500.00	415,500.00	424,400.00

Source: Annual Conference Report, Ministry of Agriculture, Forestry and Fisheries, 2003

Table 1-6: Structures Fishery Sector (2002)

Product	Quantity (tons)	Estimated Value (US$)	Percentage of Total Value (%)
Inland Fishery Capture	360,300.00	576,480,000.00	82.88
Marine Fishery Capture	45,850.00	91,700,000.00	13.18
Aquaculture	18,250.00	27,375,000.00	3.94
TOTAL	424,400.00	695,555,000.00	100.00

Source: Annual Conference Report, Ministry of Agriculture, Forestry and Fisheries, 2003

Forestry and Forest Production

According to forestry production reported to the Ministry of Agriculture, Forestry and Fisheries (MAFF) by the Administration of Forestry, there was no logging and only 12,735 cubic meters of sawn timber were produced in 2002 (Annual Conference 2003), compared to 123 thousand cubic meters of logs and 16,174 cubic meters of sawn timber produced in 2001.

Table 1-7: Forestry Production From 2000-2002

Products	Production		
	2000	2001	2002
Wood Processing (m3)	19,789.00	16,174.00	12,735.00
Non-Wood Products (tons)	51,310.00	37,974.00	8,127.00

Source: Annual Conference Report, Ministry of Agriculture, Forestry and Fisheries, 2003

Table 1-8: Structure of the Forestry Sector (2002)

Product	Quantity	Value(US$)
Saws / Processed Timber (m3)	12,735.00	4,754,399.99
Non-Wood Products (tons)	8,127.00	NA

Source: Annual Conference Report, Ministry of Agriculture, Forestry and Fisheries, 2003

Rubber Production

Estimated production has reached approximately 40,000 tons per year, almost 80% of the level of the late 1960s. For the necessary comprehensive restructuring and improvement to take place, the Government has established a privatization rubber production policy and management in recent years.

Table 1-9: Rubber Production and Area From 2000-2002

Products	Area (ha)			Production (tons)		
	2000	2001	2002	2000	2001	2002
Rubber	1,725.97	2,165.35	29,118.61	76,464.67	43,054.00	32,774.00

Source: Annual Conference Report, Ministry of Agriculture, Forestry and Fisheries, 2003

Agricultural Land Use

The rapidly increasing population of Cambodia has placed great demands on the available living space and agricultural production areas of the country. Table 1-10 shows information on agricultural land use and other land use components in Cambodia in 2002.

Table 1-10: Agricultural Land Use (2002)

Classification	Area (ha)	Percentage (%)
Evergreen forest land (Protected Areas, Concession Forest, Forest Reserve, and Other Forest Areas)	11.10	61.30
Shrub forest land	1.29	7.70
Cultivate land	2.70	12.00
Concession fishing lots	1.00	5.30
Town	1.00	5.30
Agricultural land concession	0.81	4.00
Mines field and UXO	0.10	0.60
TOTAL	18.00	99.20

Source: Ministry of Agriculture, Forestry and Fisheries, 2003

Referring to the table above, total cultivation area varies between 2.7 and 3.1 million hectare, including about 2.1 to 2.3 million hectares (approximate 10% of total country area) in the rice production area. Approximately 6-9 million hectares are subsidiary crops production areas.

1.3.2 Industrial Sector

Before 1993, Cambodia had very limited industrial investment. The investment in the industrial sector has improved since 1993, which is considered the basis year for industrial development in Cambodia. According to the stability of economical development policy in Cambodia and appropriation of investment law and other regulation and Generalized System of Preference (GSP) provided by industrial countries, industrial development has rapidly increased, especially for textiles and wearing apparel. Textile and wearing apparel, dressing, dyeing of fur, food and beverages are the main industrial products, comprising 24% of 2001 GDP. However, Cambodia's industrial sector is in its infancy and is now looking forword to large-scale development in the near future.

Manufacturing

According to Ministry of Industry, Mines and Energy registration data, approximately 27,475 manufacturing establishments (small, medium and large) were operating in Cambodia in 2001. Of these establishments, 274 were large establishments, 46 were medium sized, and 27,155 were small establishments or handicraft businesses.

Table 1-11: Structure of the Industrial and Manufacturing (2000 and 2001)

Year	No of Small Establishments or Handicraft Businesses Facilities	No of Medium and Large Facilities	TOTAL Facilities
2001	27,155	320	27,475
2000	25,406	340	25,746
Compare Rate 2001/2000	107%	94%	107%

Source: Annual Report of the Ministry of Industry, Mines and Energy 2003

The value of production for registered establishments in 2001 was estimated at $US 1,466,000. The value of production by textile, wearing apparel, and footwear establishments accounted for 97.5%, followed by food, beverages, and tobacco establishments at 2.2%.

Minerals

The most recent review of minerals in Cambodia was carried out by ESCAP in 1993 and confirmed the studies of the 1950's, which indicated the existence of significant mineral deposits in Cambodia. Deposits include sapphires, rubies, alluvial gold, alluvial cassiterite, silica, bauxite, manganese, slate, kaolin, coal, peat, lignite, pagodite, and phosphatide.

Mineral resources could play a significant role in the country's economic development. The mining industry in Cambodia is, at present, under-developed with little resource exploitation. The exception to this is the uncontrolled gem mining in the Northwest. Excessive mining in the Pailin region has degraded the land and is assumed to the main cause of increased siltation of the Sangkar River in Battambang.

The first mining law was enacted in 1968. A new mineral law was approved and brought in official use on July 13, 2001. The establishment of an official mineral policy and legislation, under which minerals development may proceed, is an essential step in the development of Cambodia's mineral resources.

Energy

Energy resources in Cambodia include petroleum products, gas, wood, biogas, draft animals, and biomass. Energy from coal has been used in small amounts in Cambodia’s industrial sector. In the last several years, energy demand in Cambodia has increased due to the rapid growth of the economy and industrial production including transportation, services, and electrical power generation growth. Cambodia is a net importer of crude petroleum products and gas.

The high volume of petroleum products are used for electricity production purposes, industrial production processes, and in all means of transportation. It is estimated that in rural areas, about half of all petroleum products are used in small amounts for household cooking and high amounts of petroleum are used for household lighting. The specific data regarding petroleum use by categories is not available. Data recorded for petroleum imported in 2002 is 688,000 tons, including diesel at 53.4%, gasoline 14.6%, and fuel oil 13.9%.

Cambodia began to use import gas as an energy resource for cooking in 1992. Approximately 27,000 tons of gas was imported during 2002. This energy resource is only used in urban areas and provincial towns; for poor people in rural areas, it is beyond their reach due to high costs.

Fuel-wood is the main energy source for Cambodian people. Fuel-wood is used for household cooking, providing about 90% of total household energy. Fuel-wood is inherently linked to all other economic activity such as sugar palm production, alcohol production, drying agricultural products, and brick production.

Cambodia faces big concerns regarding the unbalance between general fuel-wood demands, forest resource degradation, and the loss of multi-function forest reserves for this and next generations.

Biomass has been used as a part of energy supply source in rural areas in order to reduce use of firewood. Draft animal and biogas have been used mostly for cooking and a little bit for sugar palm production and alcohol production at the family level.

In Cambodia, the electricity generated from electrical power plants is supplied by fuel energy, hydropower plants, and solar energy resource. Most of electrical power plants use diesel and heavy fuel oil which generates 168 MWH, or 83% of total electrical supply. Hydropower plants accounted for approximately 11 MWH. Electricity generated from solar energy is small, mostly used for public light and rural household use.

Among 2,188,663 inhabitants, only 15% of Cambodian household families appear to have electricity. For Phnom Penh, about 129.2 MWH of electricity supply was used in 2002 and estimates are that this city's electrical use will increase to 200 MWH in 2006. Electricity power in province towns and cities was 50 MWH in 2002, expected to increase to 173 MWH in 2010.

1.3.3 Summary of the Agriculture and Industrial Sectors

The employed population in 1993 was 3.9 million. The agriculture sector accounted for 81% of employment, with the industrial sector at 3%, and the services sector at 16%. By 2001, total employment had increased to 6.2 million. The agriculture sector accounted for 70.49%, industry for 10.13%, and services for 19.38%. In the agricultural sector, 93% were employed in the agronomy, a further 5.73% in fisheries, and 1.27% in forestry.

Table 1-12: Overview of the Agricultural, Industrial and Other Sectors (2001)

Sector	Contribution to the GDP (%)	Number of Employees	Major Products and Services in each Sector
Industrial/ Manufacturing	24.00	628,437	Mining and quarrying, food product and beverage, tobacco products, textiles, wearing apparel, dressing and dyeing of fur, tanning and dressing of leather; luggage; handbags; footwear, wood and product of wood and cork, paper and paper products, printing and reproduction of recording media, chemical and chemical products, rubber and plastic product, non-metallic mineral product, basic metal, fabricated metal product, machinery and equipment, office, electronic machinery and apparatus, medical, precision and optical instruments, furniture, water supply and purification of water, construction equipment, etc.
Agriculture	39.60	4,372,308	Rice, maize, cassava, sweet potato, vegetable, mung bean, peanut, soya bean, sugar cane, sesame, tobacco, jute, castor oil, fruit and permanent crop, animal husbandry, fish products, forest products, rubber coffee, tea, etc.
Services	31.50	1,202.850	Hotels, restaurants, transport and communication, financial intermediation, and real estate.
VAT	5.80	-	
Bank Charged	0.90	-	Minus from GDP
TOTAL	100%	6.203.595	

Source: Public Investment Program of the Royal Government of Cambodia 2003-2005; Statistical Year Book, 2003

Agricultural Employment by Major Economic Sectors

Agronomy, hunting, and related activities accounted for about 93% of the employment in this sector, with other significant contributors being forestry, logging, fishing, and aquaculture activities (7%).

Table 1-13: Agricultural Employment by Major Economic Sector (2001)

Description	Number of Facilities	Number of People Employed		Value of Agricultural Products	
		No of People	% of Total	US$ 1,000	% of Total
Agriculture, Hunting and Relevant Activities	NA	4,063,088	92.92	1,666,222.00	99.55
Forestry, Logging and Relate	NA	55,512	1.26	4,754.40	0.28
Fishing, Operation of Fish (Fishing lots and aquaculture farms)	164	253,708	5.82	2,694.30	0.17
Total	164	4,372,308	100.00	1,673,670.70	100.00

Source: Statistical Year Book, 2003

Industrial Employment by Major Economic Sectors

In the industrial sector, the textiles and wearing apparel industries accounted for over 51.29% of the employment with other significant contributors being food manufacturing (18%) and construction (14%).

Table 1-14: Industrial Sectoral Distributions (2001)

Industrial Sector	Number of People Employed		Value of Industrial Manufacture	
	No of People	% of Total	US$	% of Total
Mining and Quarrying	11,828	1.88	1,078,974.36	0.04
Food Product and Beverage	112,225	17.86	328,063,076.92	11.04
Tobacco Products	7,208	1.15	53,145,128.21	1.79
Textile	79,719	12.69	1,074,862,820.51	36.16
Wearing Apparel	242,584	38.60	1,176,839,487.18	39.59
Dressing of Leat	11,709	1.86	136,312,564.10	4.59
Wood and Product of Wood and Cork	20,775	3.31	11,381,538.46	0.38
Paper and Paper Products	NA	NA	396,410.26	0.01
Printing and Reproduction of Recording Media	1,152	0.18	336,923.08	0.01
Chemical and Chemical Products	510	0.08	2,933,589.74	0.10
Rubber and Plastic Product	131	0.02	89,692,051.28	3.02
Non-Metallic Mineral Product	11,417	1.82	7,443,333.33	0.25
Basic Metal	5,665	0.90	73,846.15	0.00
Fabricated Metal Product	11,048	1.76	168,461.54	0.01
Machinery and Equipment Office	2,132	0.34	22,808,717.95	0.77
Electronic Machinery and Apparatus	2,147	0.34	15,897.44	0.00
Radio, TV and Communication Equipment and Apparatus	672	0.11	0	0
Medical, Precision and Optical Instruments, and Watches and Clocks	2,388	0.38	0	0
Transport Equipments, Trailers and Semi-Trailer	3,488	0.56	4,627,179.49	0.16
Furniture	9,684	1.54	4,744,871.79	0.16
Electricity, Gas, and Steam and Water Supply	2,093	0.33	56,516,923.08	1.90
Collection, Purification and Distribution of Water	1,692	0.27	1,438,974.36	0.05
Construction Equipment	88,170	14.03	0	0
TOTAL	628,437	100.00	2,972,880,769.23	100.00

Source: Statistical Year Book, 2003

CHAPTER 2
CHEMICAL PRODUCTION, IMPORT, EXPORT AND USE

This chapter provides general statistical information regarding the importing and use of chemical substances and chemical products. This national profile has divided chemicals into ten groups:

1. Chemical fertilizer
2. Pesticides
3. Chemical for pharmaceutical production
4. Industrial chemical raw materials
5. Metals and their compound products
6. Mineral fuel and petroleum products
7. Chemical products for consumer use
8. Chemical substances for laboratories
9. Chemical wastes
10. Persistent Organic Pollutants (POPs)

Cambodia is a not an industrialized country, therefore production and export of such chemicals does not exist. In general, the above chemicals are imported and used by different sectors. The importation of chemicals by private companies to be distributed and sold, to support for production, and used in their own exploitation activities. There are also small amounts of chemicals imported by governmental ministries and other institutions responsible for experiments, analyzing vector born disease protection programs, for immediate intervention in pest protection, etc. Chemical importation required the importers to respect and implement governmental procedures and regulations as is described in Chapter 4. Chemicals are also imported and processed illegally along the uncontrolled borders of Cambodia.

The statistical data relative to the importation and use of chemicals is insufficient and most of the data is not systematically gathered. The chemical statistical data in this profile have been collected from different ministries, civil society organizations, and non-governmental organizations. The majority of the data are based on sources from 2000 to 2002.

2.1 CHEMICAL FERTILIZERS

In 2002, Cambodian imported 45,334 tons of chemical fertilizers as summarized in Table 2-1 below. Notice that there are more imported chemical fertilizers than those listed due to lack of detailed nomenclature on chemical fertilizer recording procedures: those chemical fertilizers have been classified as “other fertilizers” of non-named fertilizers based on Harmonized System (H.S.Code 31.02.29.00) for instance. According to regulations, chemicals fertilizers importated and marketed in Cambodia must have a sticker label on the fertilizer’s packaging in the Khmer language. However, in real practice, a few chemical fertilizers have such labeling.

Table 2-1: List of Chemical Fertilizers Imported into Cambodia (2002)

No	Common Name of Chemical Fertilizers	Imported Origin	Quantity (tons)
1	Amm Nitrate	Singapore	150.50
2	DAP	Thailand	9,616.00
3	Fertilizer for Oil Palm Tree	Malaysia	1,670.00
4	NP	Thailand	2,735.00

No	Common Name of Chemical Fertilizers	Imported Origin	Quantity (tons)
5	NPK	Thailand	1,348.00
6	Urea	China, Vietnam	3,482.50
7	Other Fertilizers	Thailand, Vietnam and USA	26,332.00
	Total		45,335.00

Source: Statistic of Imported Goods, Year 2002, Ministry of Commerce, Dept of Camcontrol

These fertilizers are used in rice production and agro-industrial crops such as tobacco, bean rubber, oil palm, and vegetables. No specific data related to the quantity of chemical fertilizers as applied on those crops exists. There are not many Cambodian farmers who are aware of the effective use of chemical fertilizers; most learn about effective use through agricultural extension workers and agricultural extension programs. For Cambodia's farmers who are unaware of the proper use of fertilizers, paralleled with the lack of readable Khmer language labeling, financial loss and ineffective crop production result.

2.2 PESTICIDES

Cambodia is not a pesticides producer or exporter. Imported pesticides are divided into four main groups: *insecticides, herbicides, fungicides, and rodenticides.* In 2002, Cambodians legally imported approximately 200 tons as describes in Table 2-2 below. Besides these, pesticides importation also occurred by illegal importers active along the uncontrollable borders of Cambodia.

Table 2-2: Pesticides Imported In Cambodia for Agricultural Sector

No	Chemical Substances	Quantity (ton)	Price (US$)	Imported Origin
1	Insecticides	145.42	127,337.00	Thailand, Vietnam, China, Malaysia, France, Singapore and Taiwan
2	Herbicides	16.14	69,731.00	
3	Fungicides	7.02	10,262.00	
4	Rodenticides	29.88	18,526.00	
	TOTAL	198.46	225,856.00	

Source: Statistic of Imported Goods, Ministry of Commerce, Department of Camcontrol Year 2002

According to the regulations described in Chapter IV, pesticides importation must be authorized by the Ministry of Agriculture, Forestry and Fisheries and have to sticker explanation labeling on the packaging in Khmer language regarding the health and environmental factors affected by pesticides. However, little amounts of pesticides seen in local markets have the Khmer language labeling. Table 2-3 below shows a list of 419 pesticides on sale in the market in 2004.

Table 2-3: List of Pesticides on Sale in the Cambodia Market 2004

No.	Trade name	Common name	Packed size	% Conc.	Manufacturer	Label	Chemical Type	Recom.	Main use	WHO	PIC
1	558	dichlorvos+fenvalerate	2 ml	2.5	China	Chinese	pyrethroid	Per	I	II	
2	-MAGAZIN	mancozeb	500 g	80.0	Thailand	Thai	dithiocarbamate	Per	F	U	
3	-Mi shell	zinc phosphide	10 g	80.0	Thailand	Thai	inorganic rodenticide	Res	R	Ib	
4	95% Carbaril power	carbaryl	100 g	95.0	China	English	carbamate	Per	I	II	
5	Abamet	abamectin	100, 4000ml	1.8	8973042	Thai	Biopesticide	Unc	I	III	
6	Actara 25 WG	thiamethoxam	1 g	25.0	Vietnam	Vietnamese	neonicotinoid	Per	I	III	
7	Actellic 50 EC	pirimiphos-ethyl	1000 ml	50.0	France	English	organophosphorus	Res	I	Ib	
8	Almix 20 WP	metsulfuron methyl+ chlorimuron ethyl	100 ml	20.0	Vietnam	Vietnamese	sulfonylurea + chloroacetanilide	Unc	H	U	
9	ANCO 720 DD	2, 4-D	480 ml	72.0	An Giang	Vietnamese	phenoxyacetic acid	Per	H	II	
10	Andoril 250EC	cypermethrin	1L	25.0	Vietnam	Vietnamese	pyrethroid	Per	I	II	
11	Ankoun.V	parathion methyl	500 ml	50.0	Thailand	Thai	organophosphorus	Ban	I	Ia	*
12	Annogvin 45SC	hexaconazole	480 ml	4.5	Vietnam	Vietnamese		Per	F	U	
13	Antibac	streptomycin sulphate+ oxytetracycline hydrochloride	1000 ml		Thailand	Thai	antibiotic	Unc	B	III	
14	Antracol 70 WP	propineb	100 g	70.0	Agritech.VN	Vietnamese	dithiocarbamate	Per	F	U	
15	Anvil 5 SC	hexaconazole	1000 ml	5.0	Vietnam	Vietnamese		Per	F	U	
16	Apadrin	monocrotophos	480 ml	60.0	Vietnam	Vietnamese	organophosphorus	Ban	I	Ib	*
17	Appencarb super 50FL	carbendazim	480 ml	50.0	Vietnam	Vietnamese	systemic fungicide	Per	F	U	
18	APPLAUD 10 WP	buprofezin	100 g	10.0	8244946	Vietnamese		Per	I	III	
19	Arrivo 25 EC	cypermethrin	250 ml	25.0	Vietnam	Vietnamese	pyrethroid	Per	I	II	
20	Aswin	azamethiphos	10 g	0.75	Thailand	Thai	organophosphorus	Unc	I	III	
21	Atabron 5EC	chlorfluazuron	100, 500 ml	5.0	Sang Yo Kaisha	Vietnamese	benzoylurea	Unc	I	U	
22	ATHEN-M	mancozeb	500 g	16+2+62	Thailand	Thai	dithiocarbamate	Per	F	U	
23	Atonik 1.8 EC	sodium ortho-nitrophenolate+ sodium para-nitrophenolerate	100 ml	1.8		Vietnamese		Unc	PGR	III	

No.	Trade name	Common name	Packed size	% Conc.	Manufacturer	Label	Chemical Type	Recom.	Main use	WHO	PIC
		+nigroguaiacplae									
24	Atrazine 80 WP	atrazine	5 L	80.0	Thailand	Thai	chloroacetamide	Per	H	U	
25	Avidon-V	parathion methyl	100 g	3.0	Thailand	Thai	organophosphorus	Ban	I	Ia	*
26	AZINMAG	mancozeb	100 g	80.0	Thailand	Thai	dithiocarbamate	Per	F	U	
27	AZODRIN	monocrotophos	500 ml	50.0	Thailand	Thai	organophosphorus	Ban	I	Ib	*
28	AZODRIN 50 DD	monocrotophos	100, 480 ml	50.0	VIPESCO	Vietnamese	organophosphorus	Ban	I	Ib	*
29	Aztron	bacillus thuringiensis	10 g	16.0	Vietnam	Vietnamese	Biopesticide	Per	I	III	
30	B.L Tachlor 60 EC	butachlor	100 ml	60.0	Vietnam	Vietnamese	chloroacetamide	Per	H	U	
31	Bai 58	dimethoate	100 ml	40.0	Vietnam	Vietnamese	organophosphorus	Per	I	II	
32	Bamate	methamidophos	500 ml	60.0	Thailand	Thai	organophosphorus	Ban	I	Ib	*
33	Bambin	abamectin	500 ml	1.8	8973042	Thai	Biopesticide	Unc	I	III	
34	Bascide 50 EC	fenobucarb	480 ml	50.0	Vietnam	Vietnamese	carbamate	Per	I	II	
35	Basoca	dimethoate	100, 500 ml	40.0	Thailand	Thai	organophosphorus	Per	I	II	
36	Bassa 50EC	fenobucarb	480 ml	50.0	Vietnam	Vietnamese	carbamate	Per	I	II	
37	Bassa tigi 50 ND	fenobucarb	100 ml	50.0	Vietnam	Vietnamese	carbamate	Per	I	II	
38	BASSAN 50 EC	fenobucarb	480 ml	50.0	An Giang	Vietnamese	carbamate	Per	I	II	
39	Basudin 10 H	diazinon	1000 g	50.0	Vietnam	Vietnamese	organophosphorus	Per	I	II	
40	Basudin 50ND	diazinon	480 ml	50.0	Vietnam	Vietnamese	organophosphorus	Per	I	II	
41	Bavistin FL	carbendazim	10 ml	50.0	Vietnam	Vietnamese	systemic fungicide	Per	F	U	
42	BB-tigi 5 H	dimethoate+fenobucarb	1 kg	3+2	Vietnam	Vietnamese	OP+CA	Unc	I	II	
43	Bek kham	zinc phosphide	6 g	80.0	Thailand	Thai	inorganic rodenticide	Res	R	Ib	
44	Benben 50 EC	carbendazim	500 ml	50.0	Thailand	Thai	systemic fungicide	Per	F	U	
45	Bent 600	methamidophos	1000 ml	60.0	Thailand	Thai	organophosphorus	Ban	I	Ib	*
46	BI 58	dimethoate	100, 240 ml	50.0	Vietnam	Vietnamese	organophosphorus	Per	I	II	
47	BiAN 40EC	dimethoate	100, 480, 1000 ml	40.0	An Giang	Vietnamese	organophosphorus	Per	I	II	

No.	Trade name	Common name	Packed size	% Conc.	Manufacturer	Label	Chemical Type	Recom.	Main use	WHO	PIC
48	Bilux 752	tetradifon	1000 ml	75.2		Thai		Unc	AC	U	
49	Binhnavil 50SC	carbendazim	1L	50.0	Vietnam	Vietnamese	systemic fungicide	Per	F	U	
50	Binhsin 70 WP	thiophanate methyl	100 g	70.0	Vietnam	Vietnamese	Benzimidazole	Per	F	U	
51	Bini 58 40EC	dimethoate	480 ml	40.0	Vietnam	Vietnamese	organophosphorus	Per	I	II	
52	Biobit 52BFC	bacillus thuringiensis	100 g	32.0	Vietnam	Vietnamese	Biopesticide	Per	I	III	
53	Bio-D	2, 4-D	500 ml	80.0	Thailand	Thai	phenoxyacetic acid	Per	H	II	
54	BI-TONIC				Viva chemicals Pesticide Co.	Thai					
55	Bonanza	cyproconazole	100 ml			Vietnamese		Unc	F	III	
56	Bos	mancozeb	100, 500, 1000 g	80.0	Thailand	Thai	dithiocarbamate	Per	F	U	
57	Bosdin	dichlorvos	100, 500, 1000 ml	50.0	Kemocraf	Thai	organophosphorus	Res	I	Ib	
58	Brodifa	brodifacoum	100 ml	0.05	Vietnam	Vietnamese	coumarin derivative	Res	R	Ia	
59	Buthyl	buprofezin	100 g	10.0	Sai Gon	Vietnamese		Per	I	III	
60	Cadazim 500 FL	carbendazim	100 ml	50.0	Vietnam	Vietnamese	systemic fungicide	Per	F	U	
61	Calidan 262.5	carbendazim	100 ml	50.0	Vietnam	Vietnamese	systemic fungicide	Per	F	U	
62	Cantop-M 72 WP	thiophanate methyl	100 g	72.0	Vietnam	Vietnamese	Benzimidazole	Per	F	U	
63	Cantosin 720 DD	2, 4-D	480 ml	72.0	Vietnam	Vietnamese	phenoxyacetic acid	Per	H	II	
64	Cantox -D50WP	iprodione	500 g	50.0	Vietnam	Vietnamese	Dicarboximide	Per	F	U	
65	Caradan 5H	carbofuran	1000 g	5.0	Vietnam	Vietnamese	carbamate	Res	I	Ib	
66	Carbaryl 85BTN	carbaryl	100 g	85.0	Vietnam	Vietnamese	carbamate	Per	I	II	
67	Carben 50 SC	carbendazim	100 ml	50.0	China	Khmer	systemic fungicide	Per	F	U	
68	Carbenda 50SC	carbendazim	1000 ml	50.0	Vietnam	Vietnamese	systemic fungicide	Per	F	U	
69	Carbenvil 50SC	carbendazim	100, 480 ml	50.0	Vietnam	Vietnamese	systemic fungicide	Per	F	U	
70	Carbenzim 500 FL	carbendazim	250 ml	50.0	Sai Gon	Vietnamese	systemic fungicide	Per	F	U	
71	Carmethrin 25 EC	cypermethrin	100 ml	25.0	Vietnam	Vietnamese	pyrethroid	Per	I	II	
72	Carphosate 41DD	glyphosate	480 ml	41.0	Vietnam	Vietnamese	glycin dervative	Per	H	U	

No.	Trade name	Common name	Packed size	% Conc.	Manufacturer	Label	Chemical Type	Recom.	Main use	WHO	PIC
73	Carphosate 480 SC	glyphosate	480 ml	48.0	Vietnam	Vietnamese	glycin dervative	Per	H	U	
74	Cascade 5 EC	flufenoxuron	100 ml	5.0	Thailand	Thai		Per	I	U	
75	Cavil 50 SC	carbendazim	240 ml	50.0	Vietnam	Vietnamese	systemic fungicide	Per	F	U	
76	Cazim	carbendazim	500 ml	50.0	Thailand	Thai	systemic fungicide	Per	F	U	
77	Cazinon 10H	diazinon	1000 g	10.0	Vietnam	Vietnamese	organophosphorus	Per	I	II	
78	Chix	cypermethrin	500 ml	25.0	Thailand	Thai	pyrethroid	Per	I	II	
79	CO 2,4-D 80BHN	2, 4-D	100 g	72.0	Vietnam	Vietnamese	phenoxyacetic acid	Per	H	II	
80	COC 85 WP	copper oxychloride	25 g	85.0	8729995	Vietnamese	copper compound	Per	F	III	
81	Cocman 69 WP	oxyclorua+mancozeb	25 g			Vietnamese		Unc	F	U	
82	Comite 73 EC	propargite	100 ml	73.0	Vietnam	Vietnamese		Per	AC	III	
83	Confidor 100 SL	imidacloprid	20 ml	10.0	Vietnam	Vietnamese	neonicotinoid	Per	I	II	
84	Cupravit	copper oxychloride	1000 g	85.0	Thailand	Thai	copper compound	Per	F	U	
85	Curzate M-8 72WP	cymoxanil+mancozeb	500 g	8+64	Vietnam	Vietnamese	dithiocarbamate	Unc	F	U+III	
86	Cyanamid	mevinphos	1000 ml	24.0	Thailand	Thai	organophosphorus	Ban	I	Ia	
87	Cyclodan 35 EC	endosulfan	100 ml	35.0	Vietnam	Vietnamese	organochlorine	Ban	I	II	
88	Cykker 10	cypermethrin	100 ml	10.0	Thailand	Thai	pyrethroid	Per	I	II	
89	Cyper 25 EC	cypermethrin	480 ml	25.0	Vietnam	Vietnamese	pyrethroid	Per	I	II	
90	CYPER ALPHA 5 ND	alpha cypermethrin	100 ml	5.0	Vietnam	Vietnamese	pyrethroid	Per	I	II	
91	Cyperan 10 EC	cypermethrin	480 ml	10.0	Vietnam	Vietnamese	pyrethroid	Per	I	II	
92	Cyperan 25 EC	cypermethrin	480 ml	25.0	Vietnam	Vietnamese	pyrethroid	Per	I	II	
93	Cyperin 10 EC	cypermethrin	100, 480 ml	10.0	8572765	Vietnamese	pyrethroid	Per	I	II	
94	Cypermethrin 10 EC	cypermethrin	500 ml	10.0	Thailand	Thai	pyrethroid	Per	I	II	
95	Cyperoid 10 EC	cypermethrin	1000 ml	10.0	India	English	pyrethroid	Per	I	II	
96	Cyperoid 25 EC	cypermethrin	1000 ml	25.0	Switzerland	English	pyrethroid	Per	I	II	
97	Cyrin 25 EC	cypermethrin	100 ml	25.0	India	Vietnamese	pyrethroid	Per	I	II	

No.	Trade name	Common name	Packed size	% Conc.	Manufacturer	Label	Chemical Type	Recom.	Main use	WHO	PIC
98	Cyrus 25	cypermethrin	100 ml	25.0	Vietnam	Vietnamese	pyrethroid	Per	I	II	
99	Daconil 75 WP	chlorothalonil	100 g	75.0	SDS Biotech	Vietnamese	chloronitrile	Unc	F	U	
100	DA-FIGHT	glyphosate	5 L	48.0	Thailand	Thai	glycin dervative	Per	H	U	
101	Dazin 50 WP	carbendazim	100 g	50.0	Vietnam	Thai	systemic fungicide	Per	F	U	
102	DDT	DDT					organochlorine	Ban	I	II	*
103	DDVP 50 ND	dichlorvos	480 ml	50.0	TIGIPESCO	Vietnamese	organophosphorus	Res	I	Ib	
104	DDVP 80 EC	dichlorvos	500 ml	50.0	Vietnam	Khmer	organophosphorus	Res	I	Ib	
105	DDVQuin 25EC	quinalphos	1L	25.0	(0650)751485	Vietnamese		Per	I	II	
106	Decis 2.5 EC	delthamethrin	100 ml	2.5	8230751	Vietnamese	pyrethroid	Per	I	II	
107	Delfin WG	bacillus thuringiensis	10 g	32.0	Vietnam	Vietnamese	Biopesticide	Per	I	III	
108	Deltacide	delthamethrin	1000 ml	2.5	Vietnam	Vietnamese	pyrethroid	Per	I	II	
109	Delthamethrin	delthamethrin	1000 ml	2.5	Vietnam	Vietnamese	pyrethroid	Per	I	II	
110	Derosal 50 SC	carbendazim	100 ml	50.0	Vietnam	Vietnamese	systemic fungicide	Per	F	U	
111	Diazinon 60EC	diazinon	1000 ml	60.0	Singapore	English	organophosphorus	Per	I	II	
112	Dibadan		100 g	95.0	Vietnam	Vietnamese					
113	Dibathote 40 EC	dimethoate	1000 ml	40.0	Vietnam	Vietnamese	organophosphorus	Per	I	II	
114	Dichlor	dichlorvos	500 ml	50.0	Thailand	Thai	organophosphorus	Res	I	Ib	
115	Diji-one 40EC	isoprothiolane	480 ml	40.0	Vietnam	Vietnamese	Phosphorothiolate	Per	F	III	
116	Dimethoate	dimethoate+fenobucarb	1 kg	3+2	8243077	Vietnamese	organophosphorus	Unc	I	II	
117	Dimethoate 40 EC	dimethoate	1000 ml	40.0		English	organophosphorus	Per	I	II	
118	Dinear	dichlorvos	100 ml	50.0	Thailand	Thai	organophosphorus	Res	I	Ib	
119	Dineb-D	mancozeb	500 g	80.0	Thailand	Thai	dithiocarbamate	Per	F	U	
120	Dipel 6.4 DF	bacillus thuringiensis	10 g	16.0	Vietnam	Vietnamese	Biopesticide	Per	I	III	
121	Dola 02X	thiourea	1 kg	97.0	Vietnam	Vietnamese	plant growth regulator	Unc	PGR		
122	Door	parathion methyl	100 ml	50.0	Thailand	Thai	organophosphorus	Ban	I	Ia	*

No.	Trade name	Common name	Packed size	% Conc.	Manufacturer	Label	Chemical Type	Recom.	Main use	WHO	PIC
123	DP 50	dichlorvos	100 ml	50.0	Thailand	Thai	organophosphorus	Res	I	Ib	
124	Dupont	diazinon	100 ml	50.0	Thailand	Thai	organophosphorus	Per	I	II	
125	Elxydol-D	parathion methyl	500 ml	50.0	Thailand	Thai	organophosphorus	Ban	I	Ia	*
126	Endel 35 ND	endosulfan	500 ml	35.0	Thailand	Thai	organochlorine	Ban	I	II	
127	Endosol 35 EC	endosulfan	100 ml	35.0	Vietnam	Vietnamese	organochlorine	Ban	I	II	
128	Endosulfen 35 EC	endosulfan	1000 ml	35.0		English	organochlorine	Ban	I	II	
129	Exonak	2, 4-D	5 L	80.0	Thailand	Thai	phenoxyacetic acid	Per	H	II	
130	Extra-tonic		500 ml		Thailand	Thai			PGR		
131	Famoso 240	mevinphos	500 ml	24.0	Thailand	Thai	organophosphorus	Ban	I	Ia	
132	FAMTOY 50	dimethoate	100 ml	50.0	ZHONGLI	Vietnamese	organophosphorus	Per	I	II	
133	FASTOCID 5 EC	alpha cypermethrin	100 ml	5.0	TIGIPESCO	Vietnamese	pyrethroid	Per	I	II	
134	FASTOX 5 EC	alpha cypermethrin	100 ml	5.0	8760036	Vietnamese	pyrethroid	Per	I	II	
135	Febkill 20EC	fenvalerate+dimethoate	480 ml	20.0	Vietnam	Vietnamese	pyrethroid+op	Unc	I	II+III	
136	Fenbis 25 EC	fenvalerate+dimethoate	100, 480 ml	3.5+21.5	Sai Gon	Vietnamese	pyrethroid+op	Unc	I	II	
137	Fencozeb	mancozeb	100 g	80.0	Thailand	Thai	dithiocarbamate	Per	F	U	
138	Fenkill 20 EC	fenvalerate	100, 480 ml	20.0	8760036	Vietnamese	pyrethroid	Per	I	II	
139	Filitox 50EC	methamidophos	480 ml	50.0	23 300489	Khmer	organophosphorus	Ban	I	Ib	*
140	Filitox 60DD	methamidophos	480 ml	60.0	Vietnam	Vietnamese	organophosphorus	Ban	I	Ib	*
141	Filitox 70 SC	methamidophos	480 ml	50.0	Vietnam	Vietnamese	organophosphorus	Ban	I	Ib	*
142	First 20 EC	fenvalerate	480 ml	20.0	Vietnam	Vietnamese	pyrethroid	Per	I	II	
143	Fitor	mevinphos	250 ml	24.0	Thailand	Thai	organophosphorus	Ban	I	Ia	
144	Fokeba 20%	zinc phosphide	50 g	20.0	VIPESCO	Vietnamese	inorganic rodenticide	Res	R	Ib	
145	Foldtool	omethoate	100 ml	40.0	China	Khmer	organophosphorus	Res	I	Ib	
146	Folez-folez	parathion methyl	100 ml	50.0	BAYER	Khmer	organophosphorus	Ban	I	Ia	*
147	Folidol	parathion methyl	1000 ml	50.0	BAYER	Thai	organophosphorus	Ban	I	Ia	*

No.	Trade name	Common name	Packed size	% Conc.	Manufacturer	Label	Chemical Type	Recom.	Main use	WHO	PIC
148	Folidol-E605 M50	parathion methyl	100, 250, 500, 1000, 2000ml	50.0	BAYER	Thai	organophosphorus	Ban	I	Ia	*
149	Folitec 025EC	beta-cyfluthrin	500 ml	2.5	2331440-50	Thai	pyrethroid	Per	I	II	
150	Folpan	folpet	20 g			Vietnamese		Per	F	U	
151	FORWABIT 16.00 IU	bacillus thuringiensis	100 g	16.0	FORWARD INT. LTD	English	Biopesticide	Per	I	III	
152	Fotor	mevinphos	100 ml	24.0	Thailand	Thai	organophosphorus	Ban	I	Ia	
153	Foxentol M500	parathion methyl	100 ml	50.0	4204903	Thai	organophosphorus	Ban	I	Ia	*
154	Frong 35	cypermethrin	100, 500, 1000ml	35.0	Luxen	Thai	pyrethroid	Per	I	II	
155	Fuldo	parathion methyl	100 ml	50.0	ZHONGLI	Khmer	organophosphorus	Ban	I	Ia	*
156	Fullkill 50 EC	permethrin	100 ml	50.0	Vietnam	Vietnamese	pyrethroid	Per	I	II	
157	Fungusium	carbendazim	1000 ml	50.0	Thailand	Thai	systemic fungicide	Per	F	U	
158	Furadan 3 G	carbofuran	1000 g	3.0	VIPESCO	Vietnamese	carbamate	Res	I	Ib	
159	Furadan 3%	carbofuran	1000 g	3.0	Thailand	Thai	carbamate	Res	I	Ib	
160	Garlon 250 EC	triclopyr	100 ml	25.0	Vietnam	Vietnamese	Pyridinecarboxylic acid	Unc	H	III	
161	Giant 50 EC	methamidophos	100, 500 ml	50.0	SANONDA	Khmer	organophosphorus	Ban	I	Ib	*
162	Giant 70DD	methamidophos	100, 200 ml	70.0	SANONDA	English	organophosphorus	Ban	I	Ib	*
163	Gifagal	diazinon	1000 ml	50.0		English	organophosphorus	Per	I	II	
164	Glyphosan 480DD	glyphosate	480 ml	48.0	Vietnam	Vietnamese	glycin dervative	Per	H	U	
165	GLYPHOSATE	glyphosate	1000 ml	84.0	Thailand	Thai	glycin dervative	Per	H	U	
166	Go up 480SC	glyphosate	480 ml	48.0	Vietnam	Vietnamese	glycin dervative	Per	H	U	
167	Golden door	parathion methyl	100 ml	50.0	Thailand	Thai	organophosphorus	Ban	I	Ia	*
168	Gramoxone	paraquat	1000 ml		Thailand	Vietnamese	bipyridylium derivative	Ban	H	II	
169	HEDONAL 95 SP	2, 4-D	500, 1000 g	80.0	BAYER	Thai	phenoxyacetic acid	Per	H	II	
170	Helper 5G	thiosultap-sodium	1000 g	5.0	SANONDA	English	nereistoxin	Unc	I	II	
171	Hoppercin 50ND	fenobucarb	500 ml	50.0	Vietnam	Vietnamese	carbamate	Per	I	II	
172	HOPSAN 75	fenthoate + fenobucarb	250, 480 ml	45+30	PSC	Vietnamese	organophosphorus	Unc	I	II	

No.	Trade name	Common name	Packed size	% Conc.	Manufacturer	Label	Chemical Type	Recom.	Main use	WHO	PIC
173	hormon					Vietnamese			PGR		
174	Imperator 50 EC	permethrin	1000 ml	50.0	Singapore	English	pyrethroid	Per	I	II	
175	JACKET	abamectin	500 ml	1.8	8973042	Thai	Biopesticide	Unc	I	III	
176	K.G.E	zinc phosphide	50 g	80.0	Thailand	Thai	inorganic rodenticide	Res	R	Ib	
177	K.othrin 25EC	delthamethrin	1000 ml	2.5	Thailand	Thai	pyrethroid	Per	I	II	
178	Karate 2.5 EC	lambda cyhalothrin	250, 480 ml	2.5	Sygenta	Vietnamese	pyrethroid	Per	I	II	
179	Kar-ba 48%	glyphosate	4000 ml	48.0	Thailand	Thai	glycin dervative	Per	H	U	
180	Kasai 21,2 WP	fthalide+kasugamycin	100 g	20+1.2	Vietnam	Vietnamese		Unc	F	U	
181	Kasmin 2L	kasugamycin	500 g			Vietnamese		Per	F	U	
182	Kayazinon 40 EC	diazinon	480 ml	40.0	Vietnam	Vietnamese	organophosphorus	Per	I	II	
183	Klerat 0.05	brodifacoum	2 ml	0.05	China	Chinese	coumarin derivative	Res	R	Ia	
184	Komix BFC 201				Thailand	Thai			PGR		
185	Korathe3%	carbofuran	1000 g	3.0	Thailand	Thai	carbamate	Res	I	Ib	
186	Koutnok 10	cypermethrin	100, 250, 500, 1000ml	10.0	Thailand	Thai	pyrethroid	Per	I	II	
187	krachoa 330	dicrotophos	100 ml	33.0	Thailand	Thai	organophosphorus	Res	I	Ib	
188	Kvinphos 24	mevinphos	100, 250, 500, 1000 ml	24.0	Thailand	Thai	organophosphorus	Ban	I	Ia	
189	Lannat	methomyl	500 g	40.0	Thailand	Thai	carbamate	Ban	I	Ib	
190	Lenmeb-M	methomyl	1000 g	40.0	Thailand	Thai	carbamate	Ban	I	Ib	
191	LOCKPHOS	mevinphos	100, 250, 500, 1000 ml	24.0	Thailand	Thai	organophosphorus	Ban	I	Ia	
192	Loxane ZEB	carbendazim	100 ml	50.0	Thailand	Thai	systemic fungicide	Per	F	U	
193	L-Talon	methamidophos	1000 ml	60.0	Thailand	Thai	organophosphorus	Ban	I	Ib	*
194	Luxen VP	dichlorvos	1000 ml	50.0	Thailand	Thai	organophosphorus	Res	I	Ib	
195	Luxenben 40	chlorpyrifos	1000 ml	40.0	Thailand	Thai	organophosphorus	Unc	I	II	
196	Luxenmala 83	malathion	500 ml			Thai	organophosphorus	per	I	III	
197	Luxenmet 40	dimethoate	500, 1000ml	40.0	Luxen	Thai	organophosphorus	Per	I	II	

No.	Trade name	Common name	Packed size	% Conc.	Manufacturer	Label	Chemical Type	Recom.	Main use	WHO	PIC
198	Luxenphos	mevinphos	1000 ml	24.0	Thailand	Thai	organophosphorus	Ban	I	Ib	
199	LUXENPHOSATE 48	glyphosate	1000, 4000 ml	48.0	Thailand	Thai	glycin dervative	Per	H	U	
200	Luxenpob	cypermethrin	100 ml	10.0	Thailand	Thai	pyrethroid	Per	I	II	
201	Luxentoy 10	cypermethrin	100 ml	10.0	Thailand	Thai	pyrethroid	Per	I	II	
202	Luxenzodrin	monocrotophos	500 ml	60.0	4204903	Thai	organophosphorus	Ban	I	Ib	*
203	LY RIN 480DD	glyphosate	480 ml	48.0	7660815	Vietnamese	glycin dervative	Per	H	U	
204	Mablet 90 S	chlordane	500 ml	40.0	Thailand	Thai	organochlorine	Ban	I	II	*
205	make-po D	2, 4-D	1000 g	80.0	Thailand	Thai	phenoxyacetic acid	Per	H	II	
206	Mamba 41 SL	glyphosate	1000 ml	41.0	Vietnam	Vietnamese	glycin dervative	Per	H	U	
207	Mancolaxyl 72 WP	mancozeb+metalaxyl	100 g	64+8	Vietnam	Vietnamese	dithiocarbamate	Unc	F	U+III	
208	Manco-M	mancozeb	1000 g	80.0	Thailand	Thai	dithiocarbamate	Per	F	U	
209	maneb 44	maneb	500 g	80.0	Thailand	Thai	dithiocarbamate	Per	F	U	
210	MARATHON	methamidophos	100, 500 ml	60.0	277 3320	Thai	organophosphorus	Ban	I	Ib	*
211	Marbolo	parathion methyl	100, 500 ml	50.0	Thailand	Thai	organophosphorus	Ban	I	Ia	*
212	Market	glyphosate	5 L	48.0	Thailand	Thai	glycin dervative	Per	H	U	
213	Marnicro	bordeaux mixture+maneb +zineb	1000 g	63+4+4	420-4370	Thai	dithiocarbamate	Unc	F	U	
214	Match 50 ND	lufenuron	50 ml	50.0	Vietnam	Vietnamese	benzoylurea	Per	I	III	
215	Meco 60EC	butachlor	480 ml	60.0	Vietnam	Vietnamese	chloroacetamide	Per	H	U	
216	Meisus 5 SL	validamycin	100 ml	5.0	Thailand	Thai	antibiotic	Per	F	U	
217	Methamidol	methamidophos	100 ml	60.0	Thailand	Thai	organophosphorus	Ban	I	Ib	*
218	Methamidophos 60	methamidophos	1000 ml	60.0	Thailand	Thai	organophosphorus	Ban	I	Ib	*
219	Methamidophos 70	methamidophos	500 ml	70.0	023 211515	Khmer	organophosphorus	Ban	I	Ib	*
220	Methamidophos 70	methamidophos	480 ml	70.0	Vietnam	Vietnamese	organophosphorus	Ban	I	Ib	*
221	methamidophos 70 SL	methamidophos	500 ml	70.0	Thailand	Thai	organophosphorus	Ban	I	Ib	*
222	Methaphos 40ND	methamidophos	500 ml	40.0	China	English	organophosphorus	Ban	I	Ib	*

No.	Trade name	Common name	Packed size	% Conc.	Manufacturer	Label	Chemical Type	Recom.	Main use	WHO	PIC
223	Methaphos 60	methamidophos	1000 ml	60.0	Thailand	Thai	organophosphorus	Ban	I	Ib	*
224	Methomyl	methomyl	100, 500 g	40.0	Thailand	Thai	carbamate	Ban	I	Ib	
225	Methon	methamidophos	500 ml	60.0	Thailand	Thai	organophosphorus	Ban	I	Ib	*
226	Methyate 70 WP	thiophanate methyl	100 g	70.0	Bailer trading.co	Vietnamese	Benzimidazole	Per	F	U	
227	Methyl parathion 50 EC	parathion methyl	500 ml	50.0	Vietnam	Vietnamese	organophosphorus	Ban	I	Ia	*
228	Methyl parathion 50 EC	parathion methyl	500 ml	50.0	Thailand	Thai	organophosphorus	Ban	I	Ia	*
229	Mimic 20 F	tebufenozide	20, 75, 500 ml	20.0	Vietnam	Vietnamese	diacylhydrazine	Per	I	III	
230	Monitor 50 EC	methamidophos	500 ml	50.0	023 300489	Khmer	organophosphorus	Ban	I	Ib	*
231	Monitor 50 SC	methamidophos	480 ml	50.0	SANONDA	Vietnamese	organophosphorus	Ban	I	Ib	*
232	Monitor 60 SC	methamidophos	500 ml	50.0	SANONDA	Khmer	organophosphorus	Ban	I	Ib	*
233	Monitor 70DD	methamidophos	480 ml	50.0	Vietnam	Vietnamese	organophosphorus	Ban	I	Ib	*
234	MORRIS	methamidophos	100, 480, 1000 ml	60.0	6930156-60	Thai	organophosphorus	Ban	I	Ib	*
235	Mo-San	zinc phosphide	2 g	80.0	Thailand	Thai	inorganic rodenticide	Res	R	Ib	
236	Motox 5 EC	alpha cypermethrin	100, 480 ml	5.0	Vietnam	Vietnamese	pyrethroid	Per	I	II	
237	MUMMY MOUSE	zinc phosphide	100 g	80.0	Thailand	Thai	inorganic rodenticide	Res	R	Ib	
238	Nabus 12.5 EC	sethoxydim	100 ml	12.5	Vietnam	Vietnamese	Cyclohexanedione oxime	Per	H	III	
239	Naicer	abamectin	1000 ml	1.8	8973042	Thai	Biopesticide	Unc	I	III	
240	Neretox 95 WP	dimehypo/nereistoxin	100 g	95.0	Vietnam	Vietnamese	nereistoxin	Per	I	II	
241	Netoxin 18 SL	dimehypo/nereistoxin	500, 1000 ml	18.0	Sai Gon	Vietnamese	nereistoxin	Per	I	II	
242	Netoxin 18 WP	dimehypo/nereistoxin	100, 200 g	18.0	Sai Gon	Vietnamese	nereistoxin	Per	I	II	
243	New ksaurant BTN	kasugamycin	100 g			Vietnamese		Per	F	U	
244	Nitox 36 EC	dimethoate+cypermethrin	480 ml	36.0	Vietnam	Vietnamese	pyrethroid+op	Unc	I	II	
245	No-lon 48	glyphosate	1000 ml	48.0	Thailand	Thai	glycin dervative	Per	H	U	
246	Nor Mice	zinc phosphide	50 g	80.0	Thailand	Thai	inorganic rodenticide	Res	R	Ib	
247	Nufarm glyphosate	glyphosate	1000 ml	36.0	Vietnam	Vietnamese	glycin dervative	Per	H	U	

No.	Trade name	Common name	Packed size	% Conc.	Manufacturer	Label	Chemical Type	Recom.	Main use	WHO	PIC
	360 AC										
248	Nugor 40 EC	dimethoate	480 ml	40.0	Vietnam	Vietnamese	organophosphorus	Per	I	II	
249	Odaya-D	2, 4-D	500 ml	79.2	Thailand	Thai	phenoxyacetic acid	Per	H	II	
250	Ofatox 400 EC	fenitrothion+trichlorfon	480 ml	10+30	Vietnam	Vietnamese	organophosphorus	Unc	I	II+III	
251	Omethoate 40%	omethoate	500 ml	40.0	China	Chinese	organophosphorus	Res	I	Ib	
252	Onecide 15 ND	fluazifop-p-buthyl	100 ml	15.0	Vietnam	Vietnamese		Per	H	III	
253	Osotspa	zinc phosphide	100 g	80.0	Thailand	Thai	inorganic rodenticide	Res	R	Ib	
254	Othocide 50 WP	captan	1000 g	50.0	Vietnam	Vietnamese	dithiocarbamate	Ban	F	U	
255	Ovansus	methamidophos	500 ml	60.0	Thailand	Thai	organophosphorus	Ban	I	Ib	*
256	Padan 95 SP	cartap	100 g	95.0	08 8233265-7	Vietnamese		Per	I	II	
257	Palathion 57	parathion methyl	500 ml	50.0	Thailand	Thai	organophosphorus	Ban	I	Ia	*
258	Pamakon	parathion methyl	500 g	50.0	Thailand	Thai	organophosphorus	Ban	I	Ia	*
259	Pantera	quizalofop-p-tefuryl	100 ml		Thailand	Thai	Aryloxyphenoxy-propionate	Unc	H	II	
260	Parakhon	paraquat	480 ml		Thailand	Thai	bipyridylium derivative	Ban	H	II	
261	Paraquat	paraquat	100 ml		Vietnam	Vietnamese	bipyridylium derivative	Ban	H	II	
262	Parathet	parathion methyl	480 ml	50.0	Thailand	Thai	organophosphorus	Ban	I	Ia	*
263	Pata 80	2, 4-D	500 g	80.0	Thailand	Thai	phonoxyacetic acid	Per	H	II	
264	PATONOX	2, 4-D	5 L	80.0	Thailand	Thai	phenoxyacetic acid	Per	H	II	
265	Pegasus 500 DD	diafenthiuron	10 g	50.0	Novartis	Vietnamese		Per	AC	U	
266	Peran 50 EC	permethrin	10, 50, 100 ml	50.0	Vietnam	Vietnamese	pyrethroid	Per	I	II	
267	Perannong 500EC	permethrin	1L	50.0	An Nong	Vietnamese	pyrethroid	Per	I	II	
268	Perkill 50 EC	permethrin	100, 500 ml	50.0	7660815	Vietnamese	pyrethroid	Per	I	II	
269	Permecide 50EC	permethrin	1L	50.0	0650-823730	Vietnamese	pyrethroid	Per	I	II	
270	Permethrin 50 EC	permethrin	100 ml	50.0	Map pacific	English	pyrethroid	Per	I	II	
271	Pestop 900 WP	monosultap	100 g		Evergreen farm	Khmer		Per	H	III	

No.	Trade name	Common name	Packed size	% Conc.	Manufacturer	Label	Chemical Type	Recom.	Main use	WHO	PIC
272	Phangtoran	copper hydroxide	500 g	85.0	Thailand	Thai	copper compound	Per	F	III	
273	Phokon	paraquat	1000 ml		Thailand	Thai	bipyridylium derivative	Ban	H	II	
274	PHOSDRIN	mevinphos	100, 500, 1000 ml	24.0	BAYER	Thai	organophosphorus	Ban	I	Ia	
275	Pivbek	abamectin	500 ml	1.8	8973042	Thai	Biopesticide	Unc	I	III	
276	Polytrin P 440 EC	cypermethrin+profenofos	480 ml	44.0	Vietnam	Vietnamese	pyrethroid+op	Unc	I	II	
277	Potary	parathion methyl	100 ml	50.0	Thailand	Thai	organophosphorus	Ban	I	Ia	*
278	Pro 3 K	abamectin	100 ml	1.8	8973042	Thai	Biopesticide	Unc	I	III	
279	Prodigy 23 F	methoxyfenozide	8 ml	23.0	Vietnam	Vietnamese	diacylhydrazine	Unc	I	III	
280	punisx 25EC	cypermethrin	480 ml	25.0	Vietnam	Vietnamese	pyrethroid	Per	I	II	
281	Pyrinex 20 EC	chlorpyrifos	480 ml	20.0	Vietnam	Vietnamese	organophosphorus	Unc	I	II	
282	QT-92 18%	zinc phosphide	25 g	20.0	Vietnam	Vietnamese	inorganic rodenticide	Res	R	Ib	
283	RAT-K 2%D	warfarin	10 g	2.0	Vietnam	Vietnamese	coumarin derivative	Per	R	Ib	
284	Red Sun	endosulfan	100 ml	35.0	Thailand	Thai	organochlorine	Ban	I	II	
285	Refent 35	fipronil+fenvalerate+ phosphamidon	100 ml	1+14+20	SANONDA	English	pyrazol+pyrethroide +op	Unc	I	II+II+Ia	
286	Refent 35	fipronil+fenvalerate+ phosphamidon	100 ml	1+14+20	SANONDA	Khmer	pyrazol+pyrethroid +op	Unc	I	II+II+Ia	
287	Regent 50 SC	fipronil	6 g	50.0	China	Chinese	pyrazol	Per	I	II	
288	Regent 50 SC 5%	fipronil	50 ml	50.0	China	Chinese	pyrazol	Per	I	II	
289	Regent 800 WG	fipronil	0.8, 1, 1.8, 2, 3, 5 g	80.0	Aventis	Vietnamese	pyrazol	Per	I	II	
290	Rezor 10 WP	zinc phosphide	10 g	10.0		English	inorganic rodenticide	Res	R	Ib	
291	Ridomil MZ 72 BHN	mancozeb+metalaxyl	100, 1000 g	64+8	Vietnam	Vietnamese	dithiocarbamate	Unc	F	U+III	
292	Ridozeb 72WP	mancozeb+metalaxyl		64+8	Vietnam	Vietnamese	dithiocarbamate	Unc	F	U+III	
293	Roundup	glyphosate	100, 1000 ml	48.0	Thailand	Thai	glycin dervative	Per	H	U	
294	Roundup 480 SC	glyphosate	1000 ml	48.0	Vietnam	Vietnamese	glycin dervative	Per	H	U	
295	Rovral 50 WP	iprodione	10 g	50.0	(061) 892322	Vietnamese	Dicarboximide	Per	F	U	

No.	Trade name	Common name	Packed size	% Conc.	Manufacturer	Label	Chemical Type	Recom.	Main use	WHO	PIC
296	S.C.S 180 EC	dimehypo/nereistoxin	500 ml	18.0	China	Khmer	nereistoxin	Per	I	II	
297	Sagomycin 20 EC	fenvalerate	100 ml	20.0	Vietnam	Vietnamese	pyrethroid	Per	I	II	
298	Sakbenpolat 24	glyphosate	1000 ml	24.0	Thailand	Thai	glycin dervative	Per	H	U	
299	Sake Te kop say V-80	zineb	250, 100 g	80.0	(056) 621015	Thai	dithiocarbamate	Per	F	U	
300	Sake Te-V 88	chlordane	100 g	24+16	(056) 621005	Thai	organochlorine	Ban	I	II	*
301	Samory	tetradifon	500 ml	75.2		Thai		Unc	AC	U	
302	Sancozeb 80WP	mancozeb	500 g	80.0	Vietnam	Vietnamese	dithiocarbamate	Per	F	U	
303	Sandoz PH	bacillus thuringiensis	1000 g	32.0	Switzerland	English	Biopesticide	Per	I	III	
304	SANOS	glyphosate	200 ml	41.0	SANONDA	Chinese	glycin dervative	Per	H	U	
305	Sapan alpha 5 EC	alpha cypermethrin	480 ml	5.0	Vietnam	Vietnamese	pyrethroid	Per	I	II	
306	SAVIDA 95 WP	thiosultap-sodium	100 g	95.0	VIPESCO	Vietnamese	nereistoxin	Unc	I	II	
307	Sbar	glyphosate	1000 ml	48.0	Thailand	Thai	glycin dervative	Per	H	U	
308	Selecron 500 EC	profenofos	100 ml	50.0	Syngenta	English	organophosphorus	Per	I	II	
309	Selecron 500 ND	profenofos	100 ml	50.0	Novartis	Vietnamese	organophosphorus	Per	I	II	
310	Sevin 85	carbaryl	100 g	85.0	Thailand	Thai	carbamate	Per	I	II	
311	Shachong dan power 90	thiosultap-sodium	50 g	90.0	China	English	nereistoxin	Unc	I	II	
312	Shachong Shuang 95 WP	thiosultap-sodium	100 g	95.0	Chong Li	Khmer	nereistoxin	Unc	I	II	
313	Shachong Shuang 95 WP	thiosultap-sodium	100 g	95.0	(04) 8239678	Vietnamese	nereistoxin	Unc	I	II	
314	SHASICIDINE 20 EC	fenvalerate	75 ml	20.0	SANONDA	English	pyrethroid	Per	I	II	
315	SHASICIDINE 20 EC	fenvalerate	2000 ml	20.0	Vietnam	Vietnamese	pyrethroid	Per	I	II	
316	Sherpa 25 ND	cypermethrin	100 ml	25.0	Vietnam	Vietnamese	pyrethroid	Per	I	II	
317	Sigtifos	methamidophos	500 ml	60.0	Thailand	Thai	organophosphorus	Ban	I	Ib	*
318	Siker 10	cypermethrin	100 ml	10.0	Thailand	Thai	pyrethroid	Per	I	II	
319	Siter King So	alachlor	500 ml	48.0	Thailand	Thai	chloroacetamide	Unc	H	Ia	

No.	Trade name	Common name	Packed size	% Conc.	Manufacturer	Label	Chemical Type	Recom.	Main use	WHO	PIC
320	Siter nissan	methamidophos	500 ml	60.0	Thailand	Thai	organophosphorus	Ban	I	Ib	*
321	Sitramec	abamectin	500 ml	1.8	8973042	Thai	Biopesticide	Unc	I	III	
322	Sonii	endosulfan	500 ml	35.0	Thailand	Thai	organochlorine	Ban	I	II	
323	Staphos	mevinphos	1000 ml	24.0	Thailand	Thai	organophosphorus	Ban	I	Ia	
324	Starnox 350	cypermethrin	100, 1000ml	35.0	Thailand	Thai	pyrethroid	Per	I	II	
325	Sudin 20 EC	fenvalerate	100 ml	20.0	Vietnam	Vietnamese	pyrethroid	Per	I	II	
326	Sudrin	mevinphos	100, 500, 1000 ml	24.0	Thailand	Thai	organophosphorus	Ban	I	Ia	
327	Sumicidine 20 EC	fenvalerate	100, 2000ml	20.0	Vietnam	Vietnamese	pyrethroid	Per	I	II	
328	Sumithion 50 ND	fenitrothion	480 ml	50.0	Vietnam	Vietnamese	organophosphorus	Per	I	II	
329	Sumsin	abamectin	100 ml	1.8	8973042	Thai	Biopesticide	Unc	I	III	
330	Sunrice	ethoxysulfuron	2 g	15.0	Agro Evo	Vietnamese	sulfonylurea	Unc	H	III	
331	Superman 12.5 EC	imidacloprid	100, 500, 1000 ml	12.5	Singapore	English	neonicotinoid	Per	I	II	
332	Supracide 40ND	methidathion	100, 500 ml	40.0	Vietnam	Vietnamese	organophosphorus	Ban	I	Ib	
333	Suthon-M	parathion methyl	100 ml	50.0	Thailand	Thai	organophosphorus	Ban	I	Ia	*
334	Tanchodrin	monocrotophos	100, 500, 1000 ml	60.0	Thailand	Thai	organophosphorus	Ban	I	Ib	*
335	Ten M	mancozeb	100, 500, 1000 g	80.0	Thailand	Thai	dithiocarbamate	Per	F	U	
336	Tenzo	cypermethrin	500 ml	10.0	Thailand	Thai	pyrethroid	Per	I	II	
337	Terex 90 SP	trichlorfon	100 g	90.0	Vietnam	Vietnamese	organophosphorus	Per	I	III	
338	Theboss	cypermethrin	100 ml	10.0	Thailand	Thai	pyrethroid	Per	I	II	
339	Thio-99	thiourea	1000 g	99.0	Thailand	Thai	plant growth regulator	Unc	PGR		
340	Thiodan 35 ND	endosulfan	100, 480 ml	35.0	Vietnam	Vietnamese	organochlorine	Ban	I	II	
341	Thiodol 35 ND	endosulfan	100 ml	35.0	Vietnam	Vietnamese	organochlorine	Ban	I	II	
342	Thom 50 EC	methamidophos	500 ml	50.0	China	English	organophosphorus	Ban	I	Ib	*
343	Thom 60 EC	methamidophos	500 ml	60.0	China	Khmer	organophosphorus	Ban	I	Ib	*
344	Thom 70 EC	methamidophos	500 ml	50.0	China	Khmer	organophosphorus	Ban	I	Ib	*

No.	Trade name	Common name	Packed size	% Conc.	Manufacturer	Label	Chemical Type	Recom.	Main use	WHO	PIC
345	Threephos	mevinphos	500 ml	24.0	Thailand	Thai	organophosphorus	Ban	I	Ia	
346	THURICIDE HP	bacillus thuringiensis	1000 g	32.0	Thailand	Thai	Biopesticide	Per	I	III	
347	Thyker	monocrotophos	100 ml	60.0	Thailand	Thai	organophosphorus	Ban	I	Ib	*
348	Tiller S	fenoxaprop-P-ethyl +2, 4-D+MPCA	100 ml	4.5+7+21	VIPESCO	Vietnamese		Unc	H	II	
349	Tilt 250 ND	propiconazole	100 ml	25.0	An Giang	Vietnamese	dithiocarbamate	Per	F	II	
350	Tilt alpha 5 EC	alpha cypermethrin	480 ml	5.0	Vietnam	Vietnamese	pyrethroid	Per	I	II	
351	Tilt supper 300 EC	propiconazole +difenoconazole	100 ml	30.0	Vietnam	Vietnamese		Unc	F	II+III	
352	T-K-O	zinc phosphide	5 g	90.0	Thailand	Thai	inorganic rodenticide	Res	R	Ib	
353	Topsin-M 70 WP	thiophanate methyl	100 g	70.0	Wisso, Japan	Vietnamese	Benzimidazole	Per	F	U	
354	Topsin-M 70 WP	thiophanate methyl	500 g	70.0	Wisso, Japan	English	Benzimidazole	Per	F	U	
355	Tora	parathion methyl	100 ml	50.0	Thailand	Thai	organophosphorus	Ban	I	Ia	*
356	Tra cantal	zinc phosphide	10 g	80.0	Thailand	Thai	inorganic rodenticide	Res	R	Ib	
357	Trakhundam	heptachlor	500 g	2.96	Thailand	Thai	organochlorine	Ban	I	II	*
358	Trebon 10 EC	ethofenprox	100 ml	10.0	8572765	Vietnamese	pyrethroid	Per	I	U	
359	Treetox	parathion methyl	100 ml	50.0	Thailand	Thai	organophosphorus	Ban	I	Ia	*
360	Trigard 100 SL	cyromazine	10 ml	10.0	Novartis	Vietnamese		Unc	L	U	
361	Trizole 20 WP	tricyclazole	100 g	20.0	Sai Gon	Vietnamese	dithiocarbamate	Per	F	II	
362	Tung Rin 10 EC	cypermethrin	480 ml	10.0	7660815	Vietnamese	pyrethroid	Per	I	II	
363	U.V.	ethion	500 ml		Thailand	Thai	organophosphorus	Unc	I	II	
364	Unochem 24	mevinphos	500 ml	24.0	Thailand	Thai	organophosphorus	Ban	I	Ia	
365	Upho-up 48	glyphosate	1000 ml	48.0	Thailand	Thai	glycin dervative	Per	H	U	
366	UPTANE	cypermethrin	500 ml	35.0	Thailand	Thai	pyrethroid	Per	I	II	
367	Usa tracantal	zinc phosphide	5 g	80.0	Thailand	Thai	inorganic rodenticide	Res	R	Ib	
368	U-T 70	methamidophos	500 ml	50.0	China	Khmer	organophosphorus	Ban	I	Ib	*
369	Validacin 5 SP	validamycin	100 ml	5.0	Vietnam	Vietnamese	antibiotic	Per	F	U	

No.	Trade name	Common name	Packed size	% Conc.	Manufacturer	Label	Chemical Type	Recom.	Main use	WHO	PIC
370	Validamycin A 3 DD	validamycin	480, 1000ml	3.0	Vietnam	Vietnamese	antibiotic	Per	F	U	
371	VALIDAN 3 DD	validamycin	480 ml	3.0	An Giang	Vietnamese	antibiotic	Per	F	U	
372	Validan 3 L	validamycin	1000 ml	3.0	Vietnam	Vietnamese	antibiotic	Per	F	U	
373	Validol-V	parathion methyl	500 g	50.0	Thailand	Thai	organophosphorus	Ban	I	Ia	*
374	V-BT	virus+bacillus thuringiensis	50 g			Vietnamese	Biopesticide	Unc	I	U	
375	Vekus 10	cypermethrin	100 ml	10.0	Kemocraf	Thai	pyrethroid	Per	I	II	
376	Vi 2.4 D 720 DD	2, 4-D	480 ml	72.0	Vietnam	Vietnamese	phenoxyacetic acid	Per	H	II	
377	VIBAM 5H	dimethoate+fenobucarb	1000 g	3+2	8230751	Vietnamese	organophosphorus	Unc	I	II	
378	Vibasa 50 ND	fenobucarb	480 ml	50.0	VIPESCO	Vietnamese	carbamate	Per	I	II	
379	Vibasu 10 H	diazinon	1000 g	10.0	VIPESCO	Vietnamese	organophosphorus	Per	I	II	
380	Vicarbeb 50HP	carbendazim	100, 500 ml	50.0	8230751	Vietnamese	systemic fungicide	Per	F	U	
381	Vicidi M50	phenthoate	100 ml	50.0	Vietnam	Vietnamese	organophosphorus	Per	I	II	
382	Vidithoate 40 ND	dimethoate	100 ml	40.0	Vietnam	Vietnamese	organophosphorus	Per	I	II	
383	VIFAST 5 ND	alpha cypermethrin	100 ml	5.0	8230751	Vietnamese	pyrethroid	Per	I	II	
384	VIFEL 50 ND	phenthoate	100 ml	50.0	Vietnam	Vietnamese	organophosphorus	Per	I	II	
385	VIFENVA 20 ND	fenvalerate	100 ml	20.0	VIPESCO	Vietnamese	pyrethroid	Per	I	II	
386	VIFURAN 3 G	carbofuran	1000 g	3.0	VIPESCO	Vietnamese	carbamate	Res	I	Ib	
387	Vihak-S	2, 4-D	1000 ml	80.0	Thailand	Thai	phenoxyacetic acid	Per	H	II	
388	Vimipc 20 ND	isoprocarb	100 ml	20.0	Vietnam	Vietnamese	carbamate	Per	I	II	
389	Vimix 13.1 DD	validamycin	500 ml	3.0	Vietnam	Vietnamese	antibiotic	Per	F	U	
390	Vimoca 20 ND	ethoprophos	500 ml	20.0	Vietnam	Vietnamese	organophosphorus	Ban	I-S	Ia	
391	Vimonyl 72 EC	mancozeb+metalaxyl	100 ml	64+8	Vietnam	Vietnamese	dithiocarbamate	Unc	F	U+III	
392	Vinbin	cypermethrin	500 ml	10.0	Thailand	Thai	pyrethroid	Per	I	II	
393	Vindo	methamidophos	100, 500 ml	60.0	Thailand	Thai	organophosphorus	Ban	I	Ib	*
394	Vip Phensa 50 ND	phenthoate	250 ml	50.0	Vietnam	Vietnamese	organophosphorus	Per	I	II	

No.	Trade name	Common name	Packed size	% Conc.	Manufacturer	Label	Chemical Type	Recom.	Main use	WHO	PIC
395	VISHER 25 ND	cypermethrin	100 ml	25.0	VIPESCO	Vietnamese	pyrethroid	Per	I	II	
396	Vitagro 50 EC	fenobucarb	480 ml	50.0	Vietnam	Vietnamese	carbamate	Per	I	II	
397	Viv adamy 3 DD	validamycin	100 ml	3.0	Vietnam	Vietnamese	antibiotic	Per	F	U	
398	VOB	abamectin	500, 100 ml	1,8	0-2897-2898	Thai	Biopesticide	Unc	I	III	
399	VP 50EC	dichlorvos	100, 250 ml	50.0	Vietnam	Vietnamese	organophosphorus	Res	I	Ib	
400	WEESTOP	buthachlor+bensulfuron methyl	100 g	27.6	Evergreen farm	Khmer	Chloroacetamide+ Sulfonylurea	Unc	H	U	
401	Whip S 7.5 EW	fenoxaprop-P-ethyl	100 ml	7.5	Can To	Vietnamese		Unc	H	II	
402	Wofatox 50 EC	parathion methyl	480 ml	50.0	Vietnam	Vietnamese	organophosphorus	Ban	I	Ia	*
403	WORLD CRON	monocrotophos	100 ml	60.0	Thailand	Thai	organophosphorus	Ban	I	Ib	*
404	World mekin 2 EC	abamectin	500 ml	2.0	8973042	Thai	Biopesticide	Unc	I	III	
405	World Toid 10 EC	cypermethrin	500 ml	10.0	Thailand	Thai	pyrethroid	Per	I	II	
406	XK-35 EC	fenvalerate+phosphamidon	100 ml	35.0	Vietnam	Vietnamese	pyrethroid+op	Unc	I	II+Ia	
407	X-phos	mevinphos	1000 ml	24.0	Thailand	Thai	organophosphorus	Ban	I	Ia	
408	Zawa	zinc phosphide	5, 25 g	80.0		Khmer	inorganic rodenticide	Res	R	Ib	
409	Zico 720 DD	2, 4-D	480 ml	72.0	Vietnam	Vietnamese	phenoxyacetic acid	Per	H	II	
410	Zico 80 BHN	2, 4-D	200, 500 g	80.0	Sai Gon	Vietnamese	phenoxyacetic acid	Per	H	II	
411	Ziltun	propanil	1000 g		Thailand	Thai	Anilide	Per	H	III	
412	Zin 80 WP	zineb	250, 1000 g	80.0	Thailand	Thai	dithiocarbamate	Per	F	U	
413	Zinc phosphide	zinc phosphide	5, 25 g	20.0	SANONDA	Vietnamese	inorganic rodenticide	Res	R	Ib	
414	Zinc phosphide 20%	zinc phosphide	250 g	20.0	SANONDA	Khmer	inorganic rodenticide	Res	R	Ib	
415	Zinc phosphide 80	zinc phosphide	500, 1000 g	80.0	Thailand	Thai	inorganic rodenticide	Res	R	Ib	
416	Zineb	zineb	100 g	80.0	Thailand	Thai	dithiocarbamate	Per	F	U	
417	Zinphos 20%	zinc phosphide	1000 g	20.0	Vietnam	Vietnamese	inorganic rodenticide	Res	R	Ib	
418	Ziper 50	carbendazim	1000 g	50.0	Thailand	Thai	systemic fungicide	Per	F	U	
419	Zony 40	omethoate	100 ml	40.0	China	Khmer	organophosphorus	Res	I	Ib	

Source: Pesticides Analysis Laboratory Plant Protection Sub-Component, Ministry of Agriculture, Forestry and Fisheries, 2004

Notes:

AC	acaricide
B	bacteriostat
Ban	Banned
F	fungicide
H	herbicide
I	insecticide
IGR	insect growth regulator
I-S	insecticide applied to soil
L	larvicide
PGR	plant growth regulator
R	rodenticide

Ia	Extremely hazardous
Ib	Highly hazardous
II	Moderately hazardous
III	Slightly hazardous
Un	Unlikely to present acute hazard in normal use
Per	Permitted
Res	Restricted
Unc	Unclassified
PIC	Prior Inform Consent
POPs	Persistent Organic Pollutants
*	Severely hazardous formulations are in PIC

As mentioned in Chapter I, Cambodia is an agricultural country where approximate 80% of the population rely on agronomy with 15% to 17% of the country under cultivation (2.7 to 3.1 million hectares) of which 2.2 to 2.3 million hectares is rice cultivation (Ministry of Agriculture, Forestry and Fisheries 2002). Thus, if we compare pesticide use with cultivation area size, we could assume that pesticide use and demand in Cambodia is low compared to other countries.

However, the main concerns with pesticides are the effects on human health and the environment, the lack of awareness among the public about pesticide's hazards, and the safe use of pesticides. On the other hand, Cambodian people prefer and increasingly rely on pesticides and consider that pesticides as their partner to provide higher value in pest protection and increase yields.

With the aim of reducing the dangers to health and the environment caused by farmers being unaware of pesticide use, the Ministry of Agriculture, Forestry and Fisheries has developed and implemented a field school program at the local level on the most appropriate kinds of pesticides to use.

2.2.1 Pesticides Imported for Public Health

To protect Cambodian's public health through the use of insecticides to eradicate disease such as malaria and dengue fever, insecticides including DDT have been imported and used. These insecticides are most often used under international donation programs, e.g. WHO and Red Cross. DDT was imported in the early 1980s from the former USSR and Holland; the stockpile was used up by 1991. According to WHO recommendations, Cambodia need not import DDT for malaria control program because we have alternatives, e.g. K.Othrin (Deltamethrin) for impregnating mosquito nets and Temophos (Organophosphate) for killing mosquito larvae. Insecticides imported for public health are summarized in Table 2-4.

Table 2-4: Insecticides Imported In Cambodia for Vecterbone Disease Control

No	Common Name of Chemical	Qty /Year	Qty/ Year 2003	Imported Origin
1	Aquat Regigion (Permethrin)	1,500 L (2000)	0	Thailand
2	DDT	100 Tons (1980)	0	Holland, USSR
3	K.Othrin(Spray)	503 L (2000)	0	France
4	K.Othrin (Deltamethrin) (Impregnated)	8,000 L (2000)	4,440 L	Thailand
5	Malahtion (Organophosphate)	16,000 L (1981)	0	Holland
6	Permethrine 10%	10,000 L (1988)	0	Holland
7	Abate/Temophos (Organophosphate)	200 Tons (Yearly imported from 1992 to present)	200 Tons	Thailand, China

Source: National Center for Malaria Control, Paratology, and Entomology, 2003

2.2.2 List of Pesticides Permitted and Severely Restricted for Use

In order to reach effective management of pesticides and based on the Governmental Ordinance (Sub-Degree) No 69 on Standard and Management of Agricultural Materials, the Ministry of Agriculture, Forestry and Fisheries also developed the ministerial ordinance (Prakas) No 598 on List of the Agricultural Pesticides in the Kingdom of Cambodia. This ministerial ordinance specifically identified pesticides permitted for use, and severely strictly for use. The following Table 2.5 presents pesticides permitted for use, and Table 2.6 shows pesticides severely restricted for use.

Table 2-5: List of Pesticides Permitted For Agricultural Use in Cambodia, 2003

No	Common Name of Chemical	Use	Toxicity Classification by WHO	Family
01	1-naphthylaceticacide	PGR	Un	Org
02	2,4 D	H	II	PAA
03	Abamectin	I	III	Bio Pesticide
04	Acephate	I	III	OP
05	Acrinathrin	I	Un	PY
06	Alpha-Cypermethrin	I	II	PY
07	Ametryn	H	III	TD
08	Anilofos	H	II	OP
09	Atrazine	H	Un	Triazine
10	Azadirachtins	I	III	BP
11	Bacillus thuringiensis	I	III	Bacterium
12	Benfuracarb	I	II	CA
13	Benomyl	F	Un	Org
14	Bensulfuron	H	Un	Org
15	Beta-cyfluthrin	I	II	PY
16	Bromacil	H	Un	Org
17	Bromuconazole	F	II	Triazole
18	Buprofezin	I	Un	TC
19	Butachlor	H	Un	OC
20	Butralin	H	III	Dinitroaniline
21	Calcium polysulfide	F	II	Inorg
22	Carbaryl	I	II	CA
23	Carbendazim	F	Un	CA
24	Carbosulfan	I	II	CA
25	Cartap	I	II	CA
26	Chlomethoxyfen (Chlormethocynil)	H	Un	OC
27	Chlorfenapyr	I	II	OC
28	Chlorothalonil	F	III	Chloronitrile
29	Chlorpyrifos	I	II	OP
30	Cinmethylin	H	Un	Cineol
31	Clomazone	H	II	
32	Copper Hydroxide	F	III	CU
33	Copper oxychloride	F	III	CU
34	Copper sulfate (Tribasic)	F	II	CU
35	Coumatetralyl	R	Ib	CO
36	Cyfluthrin	I	II	PY
37	Cypermethrin	I	II	PY
38	Cyproconazole	F	III	Azole
39	Dalapon	H	Un	
40	Deltamethrin	I	II	PY
41	Diafenthiuron	I	Un	TU
42	Diazinon	I	II	OP
43	Difenoconazole	F	III	OC
44	Dimethoate	I	II	OP
45	Diniconazole	F	III	OC

No	Common Name of Chemical	Use	Toxicity Classification by WHO	Family
46	Diuron	H	Un	
47	Epoxiconazole	F	III	Triazole
48	Esfenvalerate	I	II	PY
49	Ethephon	PGR	Un	Org
50	Etofenprox	I	Un	OC
51	Fenitrothion	I	II	OP
52	Fenobucarb /BMPC	I	II	CA
53	Fenpropathrin	I	II	PY
54	Fenthion	I	II	OP
55	Fenvalerate	I	II	PY
56	Fipronil	I	II	PY
57	Fluazifop-p-butyl	H	III	Org
58	Flufenozuron	I	Un	CU
59	Flusilazole	F	III	Triazole
60	Flutriafol	F	III	Triazole
61	Folpet/Folpel	F	Un	Org
62	Fosetyl	F	Un	Org
63	Fthalide	F	III	Reductase
64	Gibberellic acide	PGR	Un	Org
65	Glufosinate	H	III	OP
66	Glyphosate/IPA Salt	H	Un	OP
67	Hexaconazol	F	Un	Triazole
68	Hexythiazox	I	Un	OC
69	Imibenconazole	F	Un	Triazole
70	Imidacloprid	I	II	Fichlomicotmile
71	Iprobenfos	F	III	OP
72	Iprodione	F	Un	Org
73	Isoprocarb	I	II	CA
74	Isoprothiolane	F	III	Org
75	Kasugamycin/Fthalide	F	Un	Org
76	Lambda-cyhalothrin	I	II	PY
77	Linuron	H	Un	SU
78	Lufenuron	I	II	BC
79	Malathion	I	III	OP
80	Mancozeb	F	Un	DC
81	Maneb	F	Un	DC
82	MCPA	H	III	Phenoxy
83	Mecoprop	H	III	Phytohormone
84	Metiram	F	Un	CA
85	Metolachlor	H	III	Chloracetanilide
86	Metribuzin	H	Un	Triazinon
87	Metsulfuron	H	Un	Org
88	Molinate	H	II	TC
89	Monosultap	I	III	
90	Naled/Bromchlophos	I	II	OP
91	Nereistoxin/Dimehpo	I	II	Pyridine
92	Oxadiazon	H	Un	Oxadiazole

No	Common Name of Chemical	Use	Toxicity Classification by WHO	Family
93	Oxolinic Acid	F,B		Org
94	Pencycuron	F	Un	Phenylurea
95	Pendimethalin	H	III	Org
96	Permethrin	I	II	PY
97	Phenthoate/Dimephenthoate	I	II	OP
98	Phosalone	I	II	OP
99	Pretilachlor	H	Un	
100	Prochloraz	F	III	CA
101	Procymidone	F	Un	OC
102	Profenofos	I	II	OP
103	Propanil	H	III	Anilide
104	Propargite	I	III	OP
105	Propiconazole	F	II	OC
106	Propineb	F	Un	CA
107	Pyraclofos	I	II	OP
108	Pyrazosulfuron	H	Un	CA
109	Pyridaphenthion	I	III	OP
110	Quinaphos	I	II	OP
111	Quinclorac	H	Un	OC
112	Rotenone	I	II	PY
113	Sethoxydim	H	III	CO
114	Simazine	H	Un	Triazin
115	Sodium ortho-nitrophenolate+ Sodium para-nitrophenolate+ Sodium 5 + nitroguaiacolae	PGR		Org
116	Spinosad	I	III	Bio-Pesticide
117	Sulfosate	H	III	Org
118	Sulphur	F	Un	Inorg
119	Tebuconazole	F	UN	OC
120	Tebufenozide	I	III	PGR
121	Thiamethoxam	I	III	Org
122	Thiobencarb (Benthiocarb)	H	II	TC
123	Thiodicarb	I	II	CA
124	Thiophanate-methyl	F	Un	CA
125	Thiram (Thiuram, TMTD)	F	III	CA
126	Tralometrin	I	II	PY
127	Triadimefon	F	III	Triazole
128	Triadimenol	F	III	Triazole
129	Trichlorfon/Chlorophos	I	III	OP
130	Tricyclazole	F	II	Triazole
131	Tridemorph	F	II	Org
132	Validamycin	F	Un	OP
133	Virus+Bacillus thuringiensis	I	II	Bacterium
134	Warfarin	R	Ib	CO
135	Zineb	F	Un	CA

Source: Appendix 3 of the Declaration No 598 on List of the Agricultural Pesticides in the Kingdom of Cambodis dated December 15, 2003, Ministry of Agriculture, Forestry and Fisheries

Table 2-6: List of Pesticides Severely Restricted For Agricultural Use in Cambodia

No	Common Name of Chemical	Use	Toxicity Classification by WHO	Family
01	Acrolein	H	Ia	Org
02	Alachlor	H	Ia	Chloroacetanilide
03	Allyl alconol	H	Ib	
04	Aluminum phosphide/ Hydrogen phosphide	FM		IP
05	Azinphos-Ethyl (Triazotion)	I	Ib	OP
06	Azinphos-Methyl(Metiltriazothion)	I	Ib	OP
07	Azocyclotin	AC	II	OT
08	Blasticidin-S	F	Ib	
09	Brodifacoum	R	Ia	CO
10	Bromadiolone	R	Ia	CO
11	Bromoxynil / loxynil	H	II	Org
12	Buto carboxim (Butacarboxim)	I	Ib	CA
13	Carbofuran	I	Ib	CA
14	Chloropicrin	FM		IC
15	DDVP / Dichlorvos	I	Ib	OP
16	Dicofol	AC	III	OC
17	Dicrotophos	I	Ib	OP
18	Diphacinone	R	Ia	CO
19	Fenthion	I	II	OP
20	Flocoumafen	R	Ia	CO
21	Flucythrinate	I	Ib	PY
22	Formetanate	I	Ib	CA
23	Heptenophos	I	Ib	OP
24	Isazofos	I	Ib	OP
25	Isofenphos	I	Ib	OP
26	MAFA	F	III	Org
27	Magnesium phosphide	FM		IP
28	Mecarbam	I	Ib	OP
29	Methyl Bromide	FM		AB
30	Nicotine	I	Ib	Org
31	Omethoate	I	Ib	OP
32	Oxydemeton-methyl	I	Ib	OP
33	Pirimiphos-ethyl	I	Ib	OP
34	Propaphos	I	Ib	OP
35	Propetamphos	I	Ib	OP
36	Strychnine	R	Ib	
37	Thiofanox	I	Ib	CA
38	Thiometon	I	Ib	OP

No	Common Name of Chemical	Use	Toxicity Classification by WHO	Family
39	Vamidothion	I	Ib	OP
40	Zinc phosphide	R	Ib	IP

Source: Appendix 3 of the Declaration No 598 on List of the Agricultural Pesticides in the Kingdom of Cambodis dated December 15, 2003, Ministry of Agriculture, Forestry and Fisheries

Note:

AB Alkyl Bromide
AC Acaricide
AS Arsenic Compound
BC Benzamide Compound
BP Botane pesticide or Bipyridylium Derivative
CA Carbamate
CO Coumarin derivative or Coumarin Anticoagullant
CU Copper compound
DC Dithiocarbamates
F Fungicide
FM Fumigant
H Herbicide
I Insecticide
IC Inorganochlorine Compound
Inorg Inorganic Compound
IP Inorganic Phosphide
L Larvicide
N Nematicide
NP Nitrophenol derivate
O Obsolete
OC Organochlorine Compound
ORG Otganic Compound
OP Organophosphorus Compound
OT Organotin Compound
PAA Phenoxyacetic Acid derivative
PD Phtgalimide Derivative
PGR Plant Growth Regulations
PY Pyrathroid
R Rodenticide
SU Substituted Urea
TC Thiadiazin Compound or Thiocarbamate
TD Triazin derivative
TU Thiourea Compound
Un Unlikely to present acute hazard in normal use

2.3 CHEMICAL FOR PHARMACEUTICAL PRODUCTION

While there are seven pharmaceutical manufacturing enterprises operating in Cambodia, most finished pharmaceutical products for local use are imported. The chemical substances used as raw material for drug production by these enterprises are imported mostly from India, China, EU, France, and Thailand. The importation of such chemical substances require a license from the MoH. Generally, chemical substances that have been imported for pharmaceutical production are listed in Table 2.7 below:

Table 2-7: Chemical Substances Used As Raw Material for Pharmaceutical Production, 2003

No	Common Name Of Chemical	Qty (Kg)	Qty (L)	Qty (psc)
1.	Acetyl Salicylic Acid	8,500.00		
2.	Acid Citrique	1,005.00		
3.	Albendazol	980.00		
4.	Aluminum Hydroxide	7,100.00		
5.	Aluminum Hydroxide 500mg	3,500.00		
6.	Amidon	46,000.00		
7.	Aminophylline	200.00		
8.	Amitriptyline HCI	80.00		
9.	Amoxicillin + Ac Calvulenique	3,000.00		
10.	Amoxillin	34,000.00		
11.	Aroma	500.00		
12.	Artesunate	10.00		
13.	Aspartame	200.00		

No	Common Name Of Chemical	Qty (Kg)	Qty (L)	Qty (psc)
14.	Atenolol	35.00		
15.	Avicel	15,300.00		
16.	Benzoate De Sodium	500.00		
17.	Benzocaine	200.00		
18.	Biphenyl Dicarboxylate	25.00		
19.	Bromhexine	152.00		
20.	Butoforme	100.00		
21.	Caffeine	1,800.00		
22.	Calcium Carbonate	600.00		
23.	Calcium Glucoheptonate	1,400.00		
24.	Calcium Hydrogen Phosphate	5,000.00		
25.	Calcium Pantothenate	500.00		
26.	Caramel	10.00		
27.	Carbamazépine	200.00		
28.	Carbocystéine	4,000.00		
29.	Carboxymethyl Cellulose	300.00		
30.	Carmellose Sodique	4,000.00		
31.	Cefadroxil	1, 500		
32.	Cefatrizine	600.00		
33.	Cefixime	4,100.00		
34.	Cefuroxime	600.00		
35.	Cephalexin	3 000		
36.	Cetaclor	1 000		
37.	Cetirizine	50.00		
38.	Cetirizine Dichlorhydrate	5.00		
39.	Chloramine T	4,000.00		
40.	Chloramphénicol	15,100.00		
41.	Chlorexidine Digluconate (Chloral Hydrate)	1,600.00		
42.	Chlorpheniramine Maleate	3,110.00		
43.	Chlorpromazine HCI	100.00		
44.	Cimétidine	14,500.00		
45.	Ciprofloxacin	1500.00		
46.	Citrate Trisodique	300.00		
47.	Citron Non Coloré	500.00		
48.	Cloxacillin	500.00		
49.	Cloxacillin Sodium Compacted	200.00		
50.	Colorant Pharmaceutique	360.00		
51.	Cotrimoxazole	2,000.00		
52.	Cremophor	600.00		
53.	Croscarmellose Sodique	3,000.00		
54.	Cyanocobalamin (Vit. B_{12})	11.00		
55.	Cyproheptadine	525.00		
56.	Dexamethasone	12.00		
57.	Dextrin	300.00		

No	Common Name Of Chemical	Qty (Kg)	Qty (L)	Qty (psc)
58.	Dextromethorphan Hbr	50.00		
59.	Diclofenac Sodium	200.00		
60.	Doxycycline	800.00		
61.	Erythromycin	6,650.00		
62.	Esculoside	600.00		
63.	Essence		200.00	
64.	Essence Orange	500.00		
65.	Eurocol	300.00		
66.	Extrait Citron En Poudre	200.00		
67.	Ferrous Fumarate	11,500.00		
68.	Flubendazole	65.00		
69.	Folic Acid	100.00		
70.	Gelatine	5,000.00		
71.	Gliclazide	35.00		
72.	Glycerin	4,500.00		
73.	Gomme	1,000.00		
74.	Griséofulvine	5,800.00		
75.	Guaifenesin	50.00		
76.	Haloperidol	5.00		
77.	Hydroxypropyl Methylcellulose	0.50		
78.	Imipramine HCI	20.00		
79.	Indomethacin	150.00		
80.	Lactose	38,000.00		
81.	Lincomycin	2,500.00		
82.	Loperamide	24.00		
83.	Magnesium Hydroxide	100.00		
84.	Magnesium Stearate	34,700.00		
85.	Magnesium Trisilicate	200.00		
86.	Mannitol	3,000.00		
87.	Mebendazole	7,200.00		
88.	Mebevirine	10.00		
89.	Mefenamic Acid	600.00		
90.	Mefloquine	10.00		
91.	Menthol Crystallized	100.00		
92.	Metformin	595.00		
93.	Methoclopramide	25.00		
94.	Methyl Paraben	4,300.00		
95.	Methyl Parhydroxy Benzoate	200.00		
96.	Metronidazole	15,550.00		
97.	Nalidixic Acid	625.00		
98.	Nicotinamide	1,000.00		
99.	Nifedipine	25.00		
100.	Noraminopirine	5,200.00		
101.	Nystatine	2,250.00		

No	Common Name Of Chemical	Qty (Kg)	Qty (L)	Qty (psc)
102.	Ofloxacin	2,800.00		
103.	Opadryl (Oxide De Titane)	10,000.00		
104.	Paracetomol (Acetaminophen)	104,000.00		
105.	Pectin	300.00		
106.	Penicillin V Potassium	1,974.00		
107.	Phenyl Propanolamine	300.00		
108.	Phloroglucinol	2,000.00		
109.	Piracetam	50.00		
110.	Piroxicam	500.00		
111.	Polyethylene Glycol	19,900.00		
112.	POM (Parahydroxy Benzoate De Méthyle, Nipagine)	9,350.00		
113.	POP (Parahydroxy Benzoate De Propyl, Nipazol)	9,350.00		
114.	Povidone K-30	500.00		
115.	Prednisolone	40.00		
116.	Prométhazine 25mg	2,000.00		
117.	Promethazine HCI	200.00		
118.	Propyl Paraben	100.00		
119.	Propyl Parahydroxy Benzoate	200.00		
120.	PVP (Polyvinyl Pyrrolidone)	12,000.00		
121.	Pvp K-30	2,000.00		
122.	Pyrentel	2,100.00		
123.	Pyridoxine (Vit. B_6)	10,000.00		
124.	Ranitidine	300.00		
125.	Roxithromycin	210.00		
126.	Saccharinate De Na	200.00		
127.	Salbutamol	35.00		
128.	Silicate De Mg	600.00		
129.	Sillicagel 1g/bag			1,000,000.00
130.	Silymarin	305.00		
131.	Sodium Benzoate	500.00		
132.	Sodium Carboxyméthyl Cellulose	3,000.00		
133.	Sodium Gentisate	100.00		
134.	Sodium Lauryl Sulfate	500.00		
135.	Sodium Métabisulfite	18,000.00		
136.	Sodium Sacchamrinate	300.00		
137.	Sodium Starch Glycolate	12,000.00		
138.	Sorbitol Liquid	5,000.00		
139.	Stearic Acid	200.00		
140.	Sulfaguanidine	31,000.00		
141.	Sulfaméthoxazole	14,000.00		
142.	Suppocire	2,500.00		
143.	Talc	22,000.00		
144.	Tartrazine	30.00		
145.	Tetracycline	4,200.00		

No	Common Name Of Chemical	Qty (Kg)	Qty (L)	Qty (psc)
146.	Thiamine Chlorhydrate	9,000.00		
147.	Tinidazole 500	25.00		
148.	Titanium Dioxide	500.00		
149.	Trimethoprim	7,100.00		
150.	Trisodium Citrate	10,000.00		
151.	Tween (Armortant, Polysorbate De Sodium)	2,500.00		
152.	Veegum (Silicon Aluminates D'aluminium)	3,000.00		
153.	Vitamin B_5	100.00		
154.	Vitamin C (Ascorbic Acid)	13,000.00		
155.	Vivapur (Silico Aluminate De Sodium)	6,000.00		
156.	Vivasta (Sodium Starch Gluconate)	8,000.00		
	Total	710,378.50	200.00	1,000,000.00

Source: Local Products, Year 2002, Ministry of Health

2.4 INDUSTRIAL CHEMICAL RAW MATERIALS

Although Cambodia is not an industrial country, the industrial sector seems to be developing, especially since 1993. Cambodia has more than 300 operating factories relying solely on imported raw industrial chemical materials. The information and available data related to importation of industrial chemical raw materials has been provided by the Department of CAMCONTROL, Ministry of Commerce and the Department of Industrial Standard, Ministry of Industry, Mines and Energy. It is actual data on imported industrial chemicals raw materials recorded by the Ministry of Commerce at the border. These chemicals are divided into four main groups: *industrial organic chemicals, inorganic chemicals, dyeing chemicals, and other chemical substances* as listed in Table 2-8, Table 2-9, Table 2-10, and Table 2-11 as follows:

Table 2-8: Organic Chemical Substances Imported, 2002

No	Chemical Substances	Quantity (tons)	Cost (US$)	Imported Origin
1	Ethyl Acetate	4.00	1,373.00	Singapore, China, Hong Kong, Taiwan, Thailand Malaysia, Japan, Germany, and France
2	Vinyl Acetate	3.40	3,060.00	
3	n-Butyl Acetate	46.39	12,332.00	
4	Stearic acid, it salts and ester	4.05	4,010.00	
5	Other organic chemical compound	25.45	117,359.00	
6	Sugar chemical pure	0.17	1,648.00	
7	Isocyannate	43.41	12,145.00	
8	Aromatic monocarboxylic acids	59.18	13,933.00	
9	Oxalic acids, its salts and esters	14.65	13,614.00	
10	Ttoluene	44.19	15,712.00	
11	Methylene Chloride	80.09	25,388.00	
12	Ethylene Glycol	5.40	2,699.00	
13	Propelene Glycol	26.80	45,824.00	
14	Formaldehyde	33.60	10,555.00	
15	Acetic Acids	1,467.05	104,100.00	
	TOTAL	1,857.85	383,752.00	

SOURCE: Statistic of Imported Good, Year 2002, Ministry of Commerce, Department of Camcontrol

Table 2-9: Inorganic Chemical Substances Imported for General Uses, 2002

No	Chemical Substances	Quantity (tons)	Cost (US$)	Imported Origin
1	Sodium Chloride	1.95	930	Singapore, China, Hong Kong, Taiwan, Thailand, Malaysia, Japan, Germany, France, USA, Vietnam, Indonesia, and Australia
2	Aluminum Chloride	154.95	118,210.00	
3	Complex Aluminum Chloride	5.00	6,000.00	
4	Hypochlorite Compound	10.00	13,000.00	
5	Compound Chloride, include Na	4.02	8,034.00	
6	Sodium Sulphate	198.04	63,953.00	
7	Sodium Sulphite	38.77	126,205.00	
8	Tiosulphate	24.03	7,253.00	
9	Compound Disodium Sulphates	220.64	83,975.00	
10	Aluminum Sulphates	13.00	2,600.00	
11	Other Aluminum Sulphate	99.00	12,619.00	
12	Zinc Sulphates	0.20	3,140.00	
13	Compound Sulphates	3.00	903	
14	Zinc Oxides	1.50	1,875.00	
15	Aluminum Oxides	149.56	48,174.00	
16	Aluminum Hydroxide	104.31	17,525.00	
17	Iron Oxide	130.46	75,198.00	
18	Titanium Oxide	102.50	15,721.00	
19	Aluminum Fluoride	28.50	37,650.00	
20	Ammonium Chloride	19.64	7,150.00	
21	Sodium Hydroxide	118.77	86,698.00	
22	Inorganic oxygen compound non-metal	2,194.33	2,422,522.00	
23	Hydrochloric Acid	139.83	44,464.00	
24	Sulphuric Acid	56.99	4,589.00	
25	Phosphoric Acid	5.36	2,888.00	
26	Boric Acid	0.70	11,602.00	
27	Hydraulic lime	18.00	5,511.00	
28	Vermiculite	4.50	3,600.00	
29	Titanium ore Concentrate	20.00	3,057.00	
30	Siliceous fossil meal	47.72	28,149.00	
31	Sulphur	24.07	7,009.00	
32	Carbon powder	4.05	3,016.00	
33	Phosphinate Phosphinite	29.93	28,108.00	
34	Sodium Carbonate	0.71	6,720.00	

No	Chemical Substances	Quantity (tons)	Cost (US$)	Imported Origin
35	Phosphate	0.28	238.00	
36	Sodium Bicarbonate	0.71	6,720.00	
37	Potassium Bicarbonate	1.39	682.00	
38	Sodium metasilicates	2.54	3,463.00	
39	Alkali metasilicates	79.92	16,320.00	
40	Other Borax	37.90	25,486.00	
41	Salt of oxometalic acid	6.09	3,048.00	
42	Hydrogen peroxide	77.66	54,974.00	
43	Carbides of calcium	231.00	57,750.00	
44	Carbides of Silicon	0.80	1,254.00	
45	Liquid and compressed air	236.76	64,315.00	
46	Calcium Hypochlorite	58.53	15,780.00	
47	Substances, containing by weight > 99.99% Silicon	13.87	11,831.00	
48	Sodium compound	3.36	4,400.00	
49	Activated Carbon	7.80	14,990.00	
50	Sodium nitrate	5.06	955.00	
	Total	4,737.70	3,590,254.00	

Source: Statistic of Imported Good, Year 2002, Ministry of Commerce, Department of Camcontrol

Table 2-10: Chemical Substances Dyeing Industry Imported, 2002

No	Chemical Substances	Quantity (tons)	Price (US$)	Imported Origin
1	Acid Dyes	70.36	58,090	Singapore, China, Hong Kong, Taiwan, Thailand, Malaysia, Japan, Germany, and France
2	Akyl Resins	127.69	36,898	
3	Basic Dyes	21.94	22,400	
4	Color Paint	11.10	21,054	
5	Direct Dyes	0.80	4,183	
6	Disperse Dyes	100.22	83,431	
7	Mixing Disperse Dyes And Pigments	12.16	13,812	
8	Organic Composite Solvent & Thinner	2.59	1,634	
9	Other Cellulose Esters	10.00	1,712	
10	Other Organo-Inorganic Compound	40.13	19,547	
11	Other Polyesters	17.20	3,304	
12	Paints	1,579.23	70,675	
13	Paints For Anti-corrosions	0.70	176	
14	Pigment Based On Titanium Dioxide	74.01	27,115	
15	Pigments	179.95	51,468	

No	Chemical Substances	Quantity (tons)	Price (US$)	Imported Origin
16	Prepared Additive	7.50	15,160	
17	Prepared Pigment	35.60	3,900	
18	Prepared Water Pigments	49.06	28,071	
19	Priming Paints	4.20	2,523	
20	Regenerated Cellulose	19.40	5,014	
21	Sinthetic Coloring Matters	47.69	86,466	
22	Undercoat And Pigments	221.76	49,450	
23	Vanishes	114.016	71,045	
	TOTAL	2,730.10	677,128	

Source: Statistic of Imported Good, Year 2002, Ministry of Commerce, Department of Camcontrol

Table 2-11: Other Chemical Substances for Industrial Purposes, 2002

No	Chemical Substances	Quantity (tons)	Price (US$)	Imported Origin
1	Chemical Substances for Food and Beverage Production	5,943.62	2,223,990.00	Taiwan, ingapore, Italy, Indonesia, China, Hong Kong, Malaysia, Thailand, Austrlia, Japan
2	Chemical Substances for Garment and Textile Industries	49,170.90	3,331,873.00	
3	Chemical Substances for Printing and Photocopy	455.60	502,257.00	
	TOTAL	55,570.12	6,058,120.00	

Source: Statistic of Imported Good, Year 2002, Ministry of Commerce, Department of Camcontrol

Other information and available data related to importation of industrial chemical raw materials has also been provided by the Department of Industrial Standard, Ministry of Industry, Mines and Energy. This includes proposals for importation of industrial chemicals raw materials proposed by manufacturers and factories. This data may have some differences from the real data of chemicals imported. Table 2-12 and 2-13 show clear information regarding the industrial chemical raw materials used in Cambodia's industral sector.

Table 2-12: Chemical Substances Imported for Industrial Purposes, 2003

No	Chemical Substances	Quantity		Other
		Kg	Litre	
1	1-4 phenylene diamine	10		
2	ABS(Acrylonitrite Butadiene Styrene)	244,000		
3	AC 101 (Alkaline Detergent)	5,335		
4	Acetate d'ethyle	17,400		
5	Acetic acid	98,250		
6	Acetone	16,336		
7	Acetyldehyde		4	
8	Acid Dyeing Detergents	45,500		
9	Acid hydrochloric	200		
10	Acid sulphuric		2,600	
11	Acrylic Balance Liquid	47,000		
12	Acticide EP-Acticide GS-Acticide CS	8,800		

No	Chemical Substances	Quantity		Other
		Kg	Litre	
13	Activated alumina	500		
14	Activated carbon	62,000		
15	Additive drier# a 010	6,600		
16	Additive pain;anti-skinning #a060	380		
17	Adhesive primer	14,000		
18	Aerosil 200	900		
19	Airplast BYK 033-Antimousse-Defoamer	2,400		
20	Calcium Carbonate	2,350,000		
21	Alkaline Particle	20,200		
22	Alkide Resin	743,000		
23	Alphaide	86,000		
24	Aluminium paste-pintalu	1,200		
25	Aluminium Sand	200,000		
26	Aluminium silicate 820a	6,100		
27	Aluminium sulphate granular(Alum)	16,000		
28	Aluminum Dioxide	140,000		
29	Aluminum sand	150,000		
30	Aluminum sulphate	65,000		
31	Amino silicone	94,800		
32	Aminobenzal dehyde	10,000		
33	Ammonia	11,500		
34	Ammonia nature 27%	11,000		
35	Ammonia solution 25%		10	
36	Ammonium acetate	5		
37	Ammonium Chloride	8,029		
38	Ammonium ferric	25		
39	Ammonium hydrogen difluoride	50		
40	Ammonium hydroxide	35		
41	Ammonium ione (II)	35		
42	Ammonium Molybdate	2		
43	Ammonium orthophosphate	35		
44	Ammonium oxalate	35		
45	Ammonium sulfate	298,670		
46	Amonia water	2,800		
47	Amyl alcohol	500		
48	Anion exchange Resin	500		
49	Anionic Polyelectrolyte	1,000		
50	Anti-bumping agent	2		
51	ANTI-F (ANTI-FOAMING)	1,000		
52	Antifoam	600		
53	Antimony	2,000		
54	Antique oil	4,800		
55	Anti-Staining Liquid	17,000		
56	Anti-Staining Powder	30,300		
57	Arcosolv PM-Methoxy propanol	3,200		
58	Arene Orgaic Silicon	450		
59	Argon gas	350		

No	Chemical Substances	Quantity		Other
		Kg	Litre	
60	Ascobic acid	1		
61	Autolysis (Gistex pasta low sodium)	1		
62	Bacteriological agar (Oxoid L 11)	5		
63	Bacto agar(0140-01)	18		
64	Bacto peptone (difco 0118-01-8)	3		
65	Barium chloride Dihydrate	25		
66	Barium sulphate (t.bar.101)	1,000		
67	Bariumchlorid-Dihydrat	2		
68	BC Adding White Liquid	47,000		
69	BDH Soium dodecilsulphate	2		
70	Bentone SD 2	600		
71	Bentonite	1,500		
72	Bermuol	14,500		
73	Biofine	1,666		
74	Biotex-SL	8,800		
75	Bismuth nitrate	1		
76	Bitume – Vinyl Bitume (88-8/77-7…)	6,000		
77	Bleaching Liquid	94,800		
78	Bleaching Powder	117,300		
79	Borchigen 911	600		
80	Borchinox C3	120		
81	Brai de houille a 90%	10,000		
82	Bromophenol blue	12		
83	Buffer	16,800		
84	Buffer Solution PH 7.00 Merck (PH4)		15	
85	Burnt Line	1,000		
86	Butanol primaire	500		
87	Butiric acid		1	
88	Butyl acetate	18,000		
89	Butyl arbitol	4,400		
90	Butyl glycol (butyl cellosolve)	28,000		
91	Bykanol N	600		
92	Cableach-1040	19,800		
93	Calcium Carbonate	2,678,000		
94	Calcium Chloride	14,160		
95	Calcium hypochloride	396,600		
96	Calcium Naphthenate	1,000		
97	Calcium Sulphate Food Grade	11,000		
98	Carbamide	25,000		
99	Carbon Black	500		
100	Cation exchange Resin	2,500		
101	Caustic liquid 45 %		7,500	
102	Caustic soda	251,352		
103	Cawhite	25,000		
104	Cellophane tape	5,000		
105	Cellosize	31,500		
106	Cellulase	33,600		

No	Chemical Substances	Quantity		Other
		Kg	Litre	
107	China lay/kaolin	297,500		
108	Chlorate	16,800		
109	Chromic Acid	1,000		
110	Citric acid	12,000		
111	Clean Boiler Agent	30,000		
112	Cleaning Naphtha	24,800		
113	Cloparin 51 PL - Alaiflex plastifiant	3,000		
114	Clorinated rubber	2,000		
115	Coatex P90-ammonium Polyacrylate	3,500		
116	Cobalt Naphthenate	650		
117	Collupuline	1,000		
118	Colour-fixing agent	11,000		
119	Cop. Styrene acrylique AC 4-Pliolite AC 4	2,400		
120	Copolymere acrylic-Rhodopas	120,000		
121	Copper Sulphate Pentahydrate CuSO45H2O	500		
122	Crystal violet	25		
123	Cupper sulphate	3		
124	Cupric sulphate	25		
125	Cyclo Hexanone	2,400		
126	D (+) glucose	25		
127	Deep Chrome Yellow	2,500		
128	Defoamer (ss)	25,400		
129	Dehygant lfm	3,000		
130	Demethyl amino benzaldehyde	10		
131	Denature Alcohol 96%		5,000	
132	Desizing agent eds	67,700		
133	Detergent	333,800		
134	Detergent Liquid	44,700		
135	Detergent Oil	44,700		
136	Detergent Powder	54,000		
137	Dextrose monohydrate	2		
138	Diatomite FP3(M)	90,000		
139	Dibutyl phtalate – Plastifiant DBP	1,000		
140	Dicolite speed flow	35,892		
141	Dicolube CT		3,200	
142	Diethylene glycol	18,975		
143	Dipatassium hydrogen	10		
144	Direct dye	70,900		
145	Disodium hydogen phosphate	16		
146	Disolvent		34,600	
147	Dispersing agent(#963)	1,200		
148	Dispex a40	10,000		
149	Divergard 810	600		
150	DOP(Di Octyl Phthalate)	28,000		
151	Drew advantage	1,440		
152	Drew catalyze Sulphite	288		
153	Dryers (Zr,Pb,Co,Ca)	4,250		

No	Chemical Substances	Quantity		Other
		Kg	Litre	
154	Dyeing Adhesive	30,000		
155	Dyeing Oil	5,000		
156	Dyestuffes	147,000		
157	E D T A(Ehtylenediamiinetetraacetic acid)	7,804		
158	Ellosize	27,500		
159	Enzyme	165,750		
160	Enzyme acid	159,500		
161	ENZYME COLL 99S	2,500		
162	Enzyme desizing trendoli DS	267,500		
163	ENZYME HOT	5,000		
164	Epodux 312-Epodux 61-134 base	9,800		
165	Eriocrome black	8		
166	ESBO(Epoxidized Soy Bean Oil)	2,600		
167	Ethanol	12,000		
168	Ethanol absolute		30	
169	Ethyl acetate		1	
170	Ethyl acetate	28,350		
171	Ethylene diamine tetra actic acide		10	
172	Ethylene glycol	21,000		
173	Ethylene propylene	8,100		
174	Ethylglycol acetate(Arcosolv PMA)	2,000		
175	Europox – hardener "O"	1,200		
176	Extender polestar 400	21,750		
177	Eyer Bright Fast Red	2,500		
178	Ferozen Iron Reagent Powder Pillow	20		
179	Ferric chloride	5,210		
180	Ferric sulphate	10		
181	Ferrox	12,000		
182	FeSO4	54,000		
183	Filter –cel(F)	35,892		
184	Formaldehyde 37%	60,000		
185	Formaldehyde solution (37%)		5	
186	Formalin 37%	63,200		
187	Formic acid 90%	18,870		
188	Forming Agent	4,400		
189	Formulator Defoamer (NDW)	7,000		
190	Freon 502 gas	120		
191	Fructose	2		
192	Fucshin (basic)	120		
193	Glass beads	14,000		
194	Glue	83,000		
195	Glycerin	10,000		
196	Glycine	1		
197	Gohsenol	14,500		
198	Green GMN vert oxyde de Chrome	600		
199	Gypsum	6,000		
200	H2S (Sodium sulphide hydrate)	1		

No	Chemical Substances	Quantity		Other
		Kg	Litre	
201	H2SO4 98 %	310,000		
202	Hardener (rc)	5,200		
203	Hardener for solvent based epoxy	5,000		
204	Heucotron 22SN	400		
205	Hexametaphosphate de Sodium-HMPS	8,000		
206	HIPS(High Impact Polystyrene)	90,000		
207	Hop hallertau 1000mg/l	1		
208	Hop target 1000mg/l	1		
209	Hot melt glue (VS 25, VS 138)	30,000		
210	Huile Flamande – Flamande oil	4,000		
211	Hydrazinium	10,000		
212	Hydrochloric acid	466,952		
213	Hydrochloric acid		10	
214	Hydrogen peroxide	280,000		
215	Hydroxylamine hydrochloric	2		
216	Hypo sodium	78,800		
217	I.p.a(isopropyl alcohol)	6,000		
218	Instand lok – hot glue	15,650		
219	Iodine	10		
220	Iron Oxide Red	117,500		
221	Iron Oxide Yellow	10,500		
222	Isona-D	1,200		
223	Iso-octane		40	
224	Isophorone	2,280		
225	Jaune 1116 or MP 008	1,000		
226	Label glue	2,000		
227	Lactic acid		5	
228	Lactic Acid	3,260		
229	Lactose broth	50		
230	Lancowax PP	100		
231	Latex 1008	701,600		
232	Laytone 40.antisetting	750		
233	Lead	12,000		
234	Lead acetate	10		
235	Lead Naphthenate	2,800		
236	Liquid Carbon Dioxide	400,000		
237	Long oil alkyd resin	30,000		
238	Lucilite PC5	479,760		
239	Magnesium chloride	20		
240	Make appluid, Cleaning solution		150	
241	Malt extract (difco 0186-01-5)	3		
242	Mambrane lauryl sulfate brath,Oxoid MM615	5		
243	Manganese	500		
244	Manganese (II) sulfate -1- hydrate	15		
245	Manucol Ester B.	1,500		
246	Medium Chrome Yellow	2,500		
247	Mercury (II) chloride	10		

No	Chemical Substances	Quantity		Other
		Kg	Litre	
248	Metatin	9,000		
249	Methanoic Acid	3,000		
250	Methanol	1,600		
251	Methanol absolude		5	
252	Methy Lethy Lket Ocime	450		
253	Methyl butanol		15	
254	Methyl ethyl cetoxime-MECO	1,000		
255	Methyl Ethyl Ketone	84,200		
256	Methyl orange	10		
257	Methyl red	5		
258	Methyl saliylate	125		
259	Methylbenzene	15,000		
260	Methylene blue	5		
261	Methylene Chloride	72,200		
262	Molybdovanadate	2		
263	Monoisobutyrate de trymethyl pentanol	3,600		
264	Monopropylene glycol	1,200		
265	Murexide	10		
266	Na2CO3	300,000		
267	Na2EDTA	2		
268	Na2SiO3	30,000		
269	Na2SO4	500,000		
270	NaCLO3	5,000		
271	Nalco	26,152		
272	NaOH	7,500		
273	Naphtalene solvent - Naphta	9,000		
274	Natrosol 250 HHR-Celloside-Ethylmethylcellulose	3,000		
275	Neocryl B 725	5,000		
276	Nexoat 795	4,500		
277	Ninhydrin	2		
278	Nitric Acid	670		
279	Nitric acid 65% extra pure		4	
280	Norsolene 9090	1,200		
281	NP-40 (NEOPAN-40)	5,000		
282	Nuosperse fx505	500		
283	Nutrient agar	6		
284	Nylon Balance Liquid	10,000		
285	Oated alium resin	1,750		
286	Oil Doss	30,000		
287	Oil of cedarwood	10		
288	O-phenenthroline	10		
289	OROPON OR(Bating Agent)	5,400		
290	Ortho-phosphoric acid 85%		2	
291	O-tolidine	10		
292	Oxalic acid	3		
293	Oxalic Acid	177,200		
294	P.A.C	75,000		

No	Chemical Substances	Quantity		Other
		Kg	Litre	
295	P.V.A	37,500		
296	PAM	54,000		
297	Para rosaniline chloride	5		
298	Paste Glue	5,200		
299	Pastosept BK	6,000		
300	PELICAT 9667 - accelerateur Epoxy K54	300		
301	Peptone Water Agar	20		
302	Peregal 0	3,000		
303	Perma red 2B562-Red 106	400		
304	Permeation Liquid	30,000		
305	Pewax.392 35%	4,400		
306	Phenol	10		
307	Phenol phthaleine	30		
308	Phosphate de zinc	4,500		
309	Phosphoric acid	8,026		
310	Photopolymer Liquid	5,200		
311	Phthaloc Yanine Blue BS	2,500		
312	Phthaloc Yanine Green G	2,500		
313	Pigment paste black #p-640(#n)	8,950		
314	Pigment paste green #p-370(#pp)	250		
315	Pin	5,000		
316	Pitro resin	250		
317	POLIMER-	1,101,000		
318	Poly Aluminium Chloride	1,909,000		
319	Polyclare (PVPP)	237,392		
320	Polyethylene glycol 01	600,500		
321	Polymer- 110	62,000		
322	Polyurethane Chemical	400,000		
323	Polyvinyl alcohol	16,500		
324	Pon Balance Liquid x	1,000		
325	Potassium aluminum sulphate	1		
326	Potassium chloride	25		
327	Potassium chromate	20		
328	Potassium dichromate	41		
329	Potassium dihydrogen phosphate	2,500		
330	Potassium dihydrogene	10		
331	Potassium hydrogen phosphate GR,ISO	1		
332	Potassium hydroxide	51		
333	Potassium iodate	32		
334	Potassium sodium tatrate	10		
335	Potassium sulfate	12		
336	Potassium thioayanate	10		
337	Potatose dextrose agar	30		
338	Prolube	100		
339	Propylene glycol	7,200		
340	PU(Polyurethane)	40,000		
341	Pure iodine	5		

No	Chemical Substances	Quantity		Other
		Kg	Litre	
342	PURESOL 2	600		
343	Purexol-2		3,200	
344	PVC(Polyvinyl Chloride)	444,000		
345	Red oxide	7,500		
346	Red.iron.oxide 340	15,000		
347	Res. Methacryllique Typ. Neocryl B700	1,600		
348	Re'sine Vinylique	1,200		
349	Resist S	10,000		
350	Rubber solvent	50,000		
351	Safe Powder	8,000		
352	Salicylic acid	1		
353	Salt	500,000		
354	Savon d'acide-tension actif	140		
355	SCLEAN-200	5,000		
356	Sconring wetting	45,000		
357	Sconring wetting	6,800		
358	Scour TC-RC	10,000		
359	Scouring	33,600		
360	Scouring Wetting	36,600		
361	Sea Lettuce	5,200		
362	Sicoflush black / Sicoflush red / Sicoflush yellow	500		
363	Silice	2,000		
364	Silicone	210,000		
365	Silicone Oil	9,300		
366	Silver nitrate	100		
367	Soap Agent	18,600		
368	Soap Detergent	45,500		
369	Soda ash	130,000		
370	Sodium azide	50		
371	Sodium benzoate	678,400		
372	Sodium Bicarbon (NaHCO3)	12,200		
373	Sodium Bicarbonate	16,750		
374	Sodium carbonate	53,500		
375	Sodium carbonate anhydrous GR,ACS	2		
376	Sodium chloride	35		
377	Sodium Dihydrogen Phospate	200,000		
378	Sodium disulfide	1		
379	Sodium Formate	8,200		
380	Sodium hexametaphoshate	47,000		
381	Sodium hydrogen carbonate	2		
382	Sodium hydrogen sulphite	8		
383	Sodium Hydrosulphite	26,400		
384	Sodium Hydroxide	16,675		
385	Sodium Hypochlorite	87,000		
386	Sodium Hyposulphate	327,000		
387	Sodium iodite	65		
388	Sodium Metabisulphate	27,500		

No	Chemical Substances	Quantity		Other
		Kg	Litre	
389	Sodium Metasilicate	7,500		
390	Sodium molybdate dihydrate GR	1		
391	Sodium oxalate	15		
392	Sodium Sulfate	19,800		
393	Sodium Sulphide	31,200		
394	Sodium tetraborate	5		
395	Sodium Thiosulfate	85,000		
396	Sodium Tripolyphosphate	40,000		
397	Soft Agent	600,000		
398	Soluble starch	10		
399	Solvent based Epoxy	10,000		
400	Soya lecithine – mouillant	1,200		
401	Spartec	1,400		
402	Spurso.dispersing agent	1,250		
403	Stabilizer(Powder)	3,500		
404	Standard Supercel /Dicalite Speedflow	30,000		
405	Standolie -Linseed oil	2,000		
406	Starch from potato	20		
407	Sucrose analar	2		
408	Sucrose crystal	30		
409	Sugar	74,000		
410	Sulfate de baryum	10,000		
411	Sulfomic acid	1		
412	Sulfur	11,000		
413	Sulphuric acid	230,000		
414	Sunsolt	10,000		
415	Super ad-1t 10%	4,500		
416	Super dilac		800	
417	Superaid(F)	35,892		
418	Superfine Barium Sulfate 1250mesh	50,000		
419	Supreseo 5005	4,000		
420	Synolac 6811-Alkyd-Acide gras de Tall	6,000		
421	Synthetic Detergents	12,700		
422	Talc	74,000		
423	Tebgitol np 9	8,000		
424	Teepol	1,500		
425	Tettnanger(Aromatic Hop)	1,300		
426	Texanol ester alohol	1,200		
427	Texapon p.t	10,400		
428	Thickener#a-670	1,000		
429	Thymol phthaleine	20		
430	Titanium oxide	189,772		
431	Toluene	62,914		
432	Treatex 225	900		
433	Treating agent	9,600		
434	Triacetin	15,000		
435	Trichloroethylene	17,700		

No	Chemical Substances	Quantity		Other
		Kg	Litre	
436	Triethanolamine	3,201		
437	Trimethyl penthane Iso-octane		25	
438	Tri-potassium citrate monohydrate		25	
439	Trisodium citrate dethydrate	4		
440	Trisodium phosphate	1,500		
441	TS 100 – Flatting agent	100		
442	Tween 80		2	
443	Tylose	500		
444	Unsaturated polyester resin	35,650		
445	Urethanne- Uralac OR – Polystria PU base	5,200		
446	Versamid 115-115 70 BD	2,000		
447	Vinyl Acetate	10,000		
448	Viscoatex 46	3,600		
449	Wa Scattering Liquid	47,000		
450	Water based Epoxy – base	6,000		
451	Water repellent	3,000		
452	Wax	1,000		
453	Whirl Floc	2,100		
454	Whirlfloc WP-800	277		
455	White spirit	55,685		
456	WL. Nutrient agar	45		
457	Xylene	49,320		
458	Yeast extract (difco 0127-01-7)	3		
459	yflo /Dicalite Speedplus	120,000		
460	Zensoft	210,500		
461	Zinc	10		
462	Zinc Ingot	500,000		
463	Zinc sulphate	100		
464	Zing Naphthenate	1,000		
	Total	26,249,259	57,259	

Source: Department of Industrial Standard, Ministry of Industry, Mines and Energy 2004,

Table 2-13: Chemical Substances Imported for Industrial Purposes, 2003

No	Chemical Substances	Quantity		Other
		Kg	Litre	
1.	1,1,1- trichloroethane	71,850		
2.	10-pon balance liquid	40,000		
3.	1-amino-2-mapthal-4 sulfomic acid	1		
4.	1-Octanol		1	
5.	AAA Caramel S 5000=	3,000		
6.	ABS (Acrylonitrite Butadiene Styrene)	485,000		
7.	AC 101 (Alkaline Detergent)	7,635		

No	Chemical Substances	Quantity		Other
		Kg	Litre	
8.	Accelerator	4,800		
9.	Acetate d'ethyle	1,200		
10.	Acetic Acid	193,000		
11.	Acetic acid	63,150		
12.	Acetone	15,736		
13.	Acid dyeing detergents	67,500		
14.	ACROPOL (Latex for Interior)	10,000		
15.	Acrylic Binder	10,000		
16.	Acticide BX – Ikarbactericide"O"-Ecocide	3,000		
17.	Acticide EP-Acticide GS-Acticide CS	1,400		
18.	Active carbon	24,205		
19.	Acylic balance liquid	51,000		
20.	Additive anti-skin # b	600		
21.	Additive drier	6,600		
22.	Additive drier calcium	600		
23.	Additive drier cobal 10	600		
24.	Additive drier lead	600		
25.	Adhesive primer	87,000		
26.	Aerosil 200	200		
27.	Airplast BYK 033-Antimousse-Defoamer	1,200		
28.	Alcofoam	5,680		
29.	Alcosist BDR	9,500		
30.	Alcosist M	9,000		
31.	Alkaline Particle	30,000		
32.	Alkyd Resin Long Oil	300,500		
33.	Alphacide	5,000		
34.	Alphacide / troysan 198=	750		
35.	Aluminium hydroxide	700,000		
36.	Aluminium paste-pintalu	600		
37.	Aluminium sand	290,000		
38.	Aluminium silicate 820A	2,500		
39.	Aluminium sulphate	276,000		
40.	Aluminum Dioxide	300,000		
41.	Aluminum sand	100,000		
42.	Amino Silicone	47,800		
43.	Amino Silicone	10,000		

No	Chemical Substances	Quantity		Other
		Kg	Litre	
44.	Ammoium persulphate powder	2		
45.	Ammonium Acetate	5		
46.	Ammonium Chloride	8,004		
47.	Ammonium Molybdate	2		
48.	Amonia water	3,000		
49.	Amylase	200,000		
50.	Anset Tap Special	1,500		
51.	Ant migrant	800		
52.	Anti-bumping agent	2		
53.	Anti-dyeing agent	4,000		
54.	Anti-Foggant	2,000		
55.	Antimony	2,000		
56.	Antique oil	4,800		
57.	Antiskining	125		
58.	Anti-staining agent	4,000		
59.	Anti-staining liquid	110,000		
60.	Anti-Staining Powder	235,000		
61.	Aradyde GY 250	500		
62.	Arcosolv PM-Methoxy propanol	1,600		
63.	Ascobic acid	1		
64.	Autolysis (Gistex pasta low sodium)	1		
65.	Auxilaries for Dying	10,000		
66.	Auxilaries for Finishing	10,000		
67.	Auxilaries for Pretreatment	10,000		
68.	Auxilaries for Washing	10,000		
69.	Bacteriological agar (Oxoid L 11)	5		
70.	Bacto agar (0140-01)	3		
71.	Bacto peptone (difco 0118-01-8)	3		
72.	Barium sulphate (T.BAR101)	1,000		
73.	Bariumchlorid-Dihydrat	10		
74.	BC Adding White Liquid	102,000		
75.	BDH Soium dodecilsulphate	2		
76.	Bentone SD	300		
77.	Benzyl Alcohol	1,000		
78.	Biodispersant (Deg)	5,000		
79.	Biofine 19P	166		

No	Chemical Substances	Quantity		Other
		Kg	Litre	
80.	Biotex-SL	20,000		
81.	Bismuth nitrate	1		
82.	Bitume – Vinyl Bitume (88-8/77-7…)	3,000		
83.	Black Rubber	4,000		
84.	Bleaching liquid	25,500		
85.	Bleaching powder	511,000		
86.	Blinder	10,000		
87.	Blowing agent	24,500		
88.	Boiler Treatment Chemical	9,000		
89.	Borchigen 911	300		
90.	Borchinox C3	60		
91.	Brai de houille a 90%	5,000		
92.	Brightener	170,000		
93.	Bromophenol blue indicator	2		
94.	Brown fused alumina	400,000		
95.	Burnt Line	1,000		
96.	Butanol primaire	250		
97.	Butyl acetate	124,450		
98.	Butyl carbitol	4,400		
99.	Butyl cellosove	5,000		
100.	Butylated Hydroxy Amisole(BHA)	1,000		
101.	Butylated Hydroxy Toluene(BHT)	600		
102.	Butylglycol	500		
103.	Bykanol N	300		
104.	Cableach-1040	40,000		
105.	Cableach-1100-	60,000		
106.	Calcium and Magnesium Indicator Solution	470		
107.	Calcium carbonate	3,241,600		
108.	Calcium chloride	12,460		
109.	Calcium Hydroxide	14,300		
110.	Calcium hypochloride	1,800		
111.	Calcium Hypochlorite	10,000		
112.	Calcium Silicate Sectional	400		
113.	Calgon (Sodium Polyphosphate Glass)	1,000		
114.	Caluber Salt	145,000		
115.	Carbamide	73,300		

No	Chemical Substances	Quantity		Other
		Kg	Litre	
116.	Cathion Softener	120,000		
117.	Caustic liquid 45 %		15,000	
118.	Caustic Soda	356,704		
119.	Cawhite	6,000		
120.	Celite 219	4,508		
121.	Celite hyflow super cel©	35,892		
122.	Celite Standard Supercel(M)	35,892		
123.	Cellosize	20,000		
124.	Chemical dyes	8,000		
125.	China clay	12,500		
126.	Chlorine	810		
127.	Chromic Acid	1,000		
128.	Citric acid	10,000		
129.	CL 653 Non Oxidizing Biocide (Isothiazolin)	3,000		
130.	Clay	6,000		
131.	Claytone 40-antisetting	750		
132.	Clean Boiler Agent	80,000		
133.	Cleaner	50,000		
134.	Cleaning Naphtha	63,050		
135.	Clicone sil	600		
136.	Cloparin 51 PL - Alaiflex plastifiant	1,500		
137.	Clorinated rubber	1,000		
138.	Coated calcium resin	750		
139.	Coatex P90-ammonium Polyacrylate	1,750		
140.	Color Dye	25,000		
141.	Colour-fixing agent	57,500		
142.	Compound Rubber	1,000		
143.	Concentrate desizing powder	225,000		
144.	Cop. Styrene acrylique AC 4-Pliolite AC 4	1,200		
145.	Copolymere acrylic	60,000		
146.	Copper Sulphate Pentahydrate CuSO45H2O	500		
147.	Cross linking agent	20,000		
148.	Cupper sulphate	3		
149.	Cyanoacrylate adhesive	5,000		
150.	Cyclo Hexanone	4,200		
151.	Defoamer	5,500		

No	Chemical Substances	Quantity		Other
		Kg	Litre	
152.	Dehygant LFM	6,000		
153.	Denature Alcohol 96%		10,000	
154.	Desizing Agent	521,500		
155.	Detergent Liquid	309,200		
156.	Detergent Oil	50,700		
157.	Detergent Powder	428,400		
158.	Dextrose monohydrate	2		
159.	Diatomite FP3(M)	79,328		
160.	Dibutyl phtalate – Plastifiant DBP	500		
161.	Dicolite speed flow	35,892		
162.	Dicolube CT		6,400	
163.	Diethylene glycol	24,750		
164.	Direct dye	50,900		
165.	Disodium hydrogen phosphate	5		
166.	Disolvent		34,600	
167.	Dispersing Agent	59,500		
168.	Dispex a19 / alcosperse 462	750		
169.	Dissolvent	20,500		
170.	Diversol CX	1,100		
171.	DOP(Di Octyl Phthalate)	51,000		
172.	Drew advantage	1,440		
173.	Drew catalyze Sulphite	288		
174.	Dryers (Zr,Pb,Co,Ca)	2,250		
175.	Dye Acid	20,000		
176.	Dye black agent	4,000		
177.	Dyeing adhesive	82,500		
178.	Dyeing Oil	16,000		
179.	Dyestuffes	522,000		
180.	E D T A(Ehtylenediamiinetetraacetic acid)	79,404		
181.	Emulsifiers Emulsive Dispersing Agent	10,000		
182.	Enzyme acid	98,000		
183.	Enzyme desizing trendoli DS	67,500		
184.	Enzyme hot	56,000		
185.	Enzyme powder	400,000		
186.	Epodux 312-Epodux 61-134 base	3,400		
187.	ESBO(Epoxidized Soy Bean Oil)	4,600		

No	Chemical Substances	Quantity		Other
		Kg	Litre	
188.	ethanol 97%		13,020	
189.	Ethanol Denatured 96%	15		
190.	Ethyl acetate		1	
191.	Ethyl Acetate	26,850		
192.	Ethylene glycol	24,750		
193.	Ethylglycol acetate(Arcosolv PMA)	1,000		
194.	Europox – hardener "O"	600		
195.	Eva compound	50,000		
196.	Extender polester 400	1,750		
197.	Ferric chloride	5,200		
198.	Ferrous sulfate	10,000		
199.	FeSO4	60,000		
200.	Filler	6,000		
201.	Film making stuff	5,000		
202.	Filter –cel(F)	35,892		
203.	Filter Sand	50,000		
204.	Fixing Agent	100,700		
205.	Floating stone	360,000		
206.	Flourascent Agent	8,000		
207.	Formaldehyde 37%	120,000		
208.	Formalin 37%	126,400		
209.	Formic Acid	16,800		
210.	Forming Agent	7,400		
211.	Formulator Defoamer (NDW)	7,000		
212.	Fructose	2		
213.	General purpose polystyrene grade	5,000		
214.	Germicide	5,000		
215.	Glacial Acetic Acid	60,000		
216.	Glass beads	7,000		
217.	Glue	68,000		
218.	Glycine	1		
219.	Grafted polychloprene adhesives	39,000		
220.	Green GMN vert oxyde de Chrome	300		
221.	H2O2	22,000		
222.	H2SO4 98 %	710,000		
223.	Hand Builder	80,000		

No	Chemical Substances	Quantity		Other
		Kg	Litre	
224.	Hard Rubber	5,000		
225.	Hardener	25,700		
226.	Heucotron 22SN	200		
227.	Hexametaphosphate de Sodium-HMPS	1,000		
228.	High density Polyethylene	28,500		
229.	HIPS(High Impact Polystyrene)	140,000		
230.	Hisol d 206	2,000		
231.	Hop hallertau	1		
232.	Hop target	1		
233.	Horolith KEG	500		
234.	Hot melt glue	730,000		
235.	Huile de ricin hydrogenee	75		
236.	Huile Flamande – Flamande oil	2,000		
237.	Hydrochloric Acid(HCl)	351,904		
238.	Hydrogen peroxide		77,000	
239.	Hydrogen Peroxide	480,600		
240.	Hydroxylamine hydrochloric	2		
241.	Hypo sodium	78,800		
242.	Ink	19,800		
243.	Instand lok – hot glue	31,300		
244.	Iso-octane		40	
245.	Isopropyl Alcohol	13,000		
246.	Jaune 1116 or MP 008	500		
247.	K resin (kr-03)	10,000		
248.	Kaolin (China Clay)	3,000		
249.	Lactic acid 2 060	2,060		
250.	Lactic acid5 litres		5	
251.	Lancowax PP50	50		
252.	Latex T-1617	617,800		
253.	Lead	12,000		
254.	Linseed stan oil 120p	600		
255.	Liquid Soda	40,000		
256.	Liquid urea formaldehyde resin adhesive	720,000		
257.	Lobe	30,000		
258.	Long oil alkyd resin	15,000		
259.	LS-Strip	920		

No	Chemical Substances	Quantity		Other
		Kg	Litre	
260.	Lucilite PC5	479,760		
261.	Mambrane lauryl sulfate brath, Oxoid MM615	5		
262.	Mercury (II) chloride	10		
263.	Metal Sheet	10,000		
264.	Metatin G.T	7,000		
265.	Methanoic Acid	5,000		
266.	Methanol	2,200		
267.	Methyl ethyl cetoxime-MECO	500		
268.	Methyl Ethyl Ketone	9,200		
269.	Methyl Salicylate	125		
270.	Methylbenzene	25,000		
271.	Methylene chloride additif-Decapant	161,100		
272.	Mixed Phosphate	4,500		
273.	Molybdate Reagent for		1 000	
274.	Monopropylene glycol	600		
275.	Mouillant – colorolol F	350		
276.	Na2CO3	650,000		
277.	Na2EDTA	2		
278.	Na2S2O4	760,000		
279.	Na2SiO3	45 000		
280.	Na5P3O10	40,000		
281.	NaCLO3	8,000		
282.	NaOH	19,000		
283.	Naphtalene solvent - Naphta	4,500		
284.	NATROSOL B Hydroxyethylcellulose	4,001		
285.	Nature Rubber	20,000		
286.	NH4OH(25-27%) -Ammoniac Solution	500		
287.	Niclon 70% chlorine granular	2,250		
288.	Ninhydrin	2		
289.	Nitric Acid	140		
290.	Nitric acid 65% extra pure		4	
291.	NOPCO NDW (Foamaster NDW)	1,000		
292.	Norsolene 9090	600		
293.	Nylon balance liquid	45,500		
294.	Oil Doss	82,000		
295.	Oil Remover agent	60,000		

No	Chemical Substances	Quantity		Other
		Kg	Litre	
296.	Optical Brightener	4,000		
297.	OROPON OR(Bating Agent)	5,400		
298.	Ortho-phosphoric acid 85%		2	
299.	Oxalic Acid	210,803		
300.	Oxyde de Zinc	100		
301.	Oxygen indicator BBL 70504		1	
302.	P.V.A	37,500		
303.	P-A-C	155,000		
304.	Paint	9,000		
305.	PAM	60,000		
306.	Para rosaniline chloride	5		
307.	Paste Glue	7,000		
308.	Pastosept BK	12,000		
309.	PE(Polyethylene)	20,800		
310.	PELICAT 9667 - accelerateur Epoxy K54	150		
311.	Peregal 0	5,000		
312.	Perma red 2B562-Red 106	200		
313.	Permeation liquid	87,500		
314.	PET Plastic	180,000		
315.	Petro resin	15,000		
316.	Phenol formaldehyde	14,700		
317.	Phosphate de zinc	1,500		
318.	Phosphoric acid	8,026		
319.	Phosphoric acid		5	
320.	Photopolymer liquid	86,200		
321.	Pigment	19,200		
322.	Pigment black fw2v	24,300		
323.	Pitro resin	250		
324.	Plastic Rawmaterial	120,000		
325.	Plastisol	10,000		
326.	Poliphobe T.R	6,000		
327.	Poly Aluminum Chloride	378,500		
328.	Polychloroprene adhesives	39,000		
329.	Polyclar (PVPP)	236,142		
330.	Polyether Polyol	40,000		
331.	Polyethylene glycol 01	600,500		

No	Chemical Substances	Quantity		Other
		Kg	Litre	
332.	Polyethylent vinyl acetate	20,000		
333.	Polymer- 110	62,000		
334.	Polyolefin elastomer	10,000		
335.	Polyurethane adhesives	56,700		
336.	Polyurethane Chemical	665,000		
337.	Pon Balance Liquid	28,000		
338.	Potassium aluminum sulphate	1		
339.	Potassium Carbonate	3,000		
340.	Potassium chloride	5		
341.	Potassium dichromate	1		
342.	Potassium dihydrogen phosphate	2		
343.	Potassium hydrogen phosphate GR, ISO	1		
344.	Potassium hydroxide	40,016		
345.	Potassium iodate	2		
346.	Potassium Iodide	10		
347.	Potassium sulphate	2		
348.	Preservative		60,000	
349.	Primer	3,000		
350.	Printing ink	7,000		
351.	Prolube	10,000		
352.	Propylene glycol	2,150		
353.	PU(Polyurethane)	100,000		
354.	Pure iodine	5		
355.	Purexol-2		6,400	
356.	PVA Chemical Starch	100,000		
357.	PVC (Polyvinyl Chloride)	654,000		
358.	rat repellent (code no.cl203)	4,000		
359.	Red iron oxide 340	18,000		
360.	Red oxide	7,500		
361.	Refined salt	60,000		
362.	Resin	133,400		
363.	Resist S	20,000		
364.	Rocima G.T	6,000		
365.	Rubber Powder	5,000		
366.	Rubber solvent	50,000		
367.	Rubber Stuff	10,000		

No	Chemical Substances	Quantity		Other
		Kg	Litre	
368.	Rush prevention chemical	4,000		
369.	Safe powder	10,000		
370.	Sald special	20,000		
371.	Salicylic acid	1		
372.	Salt	1,245,000		
373.	Savon d'acide-tension actif	70		
374.	Scattering Liquid	22,000		
375.	Sconring wetting	45,000		
376.	Scour	33,000		
377.	Scour TC-RC	20,000		
378.	Scouring Agent	120,000		
379.	Scouring Wetting Agent	30,000		
380.	Sea lettuce	57,200		
381.	Sep Acid SPS		14,170	
382.	Septacid S		7,085	
383.	Sicoflush black/ Sicoflush red/ Sicoflush yellow	250		
384.	Silice	5,800		
385.	Silicone Oil	241,300		
386.	Soap agent	17,600		
387.	Soap detergent	40,400		
388.	Soap Powder Agent	40,000		
389.	Soda Ash	546,500		
390.	Sodium silicate	3,000		
391.	Sodium thiosulphate	100,000		
392.	Sodium Benzoate	1,200		
393.	Sodium Bicarbon (NaHCO3)	20,000		
394.	Sodium Bicarbonate	15,350		
395.	Sodium Bisulphite	6,400		
396.	Sodium Caboxy Methylcellulose	9,000		
397.	Sodium Carbonate (Na2CO3)	100,002		
398.	Sodium chlorite	500,010		
399.	Sodium Dihydrogen Phosphate (Na4P2O7)	300,000		
400.	Sodium disulfide	1		
401.	Sodium Formate	8,200		
402.	Sodium hexameta phosphate	41,000		
403.	Sodium hydrogen carbonate	2		

No	Chemical Substances	Quantity		Other
		Kg	Litre	
404.	Sodium hydrogen sulfite	8		
405.	Sodium Hydrosulfide	357,400		
406.	Sodium Hydroxide	13,210		
407.	Sodium Metadisulphate	100,000		
408.	Sodium metasilicate	105,000		
409.	Sodium molybdate dihydrate GR	1		
410.	Sodium pentachlorophenate	23,000		
411.	Sodium sulphate	175,000		
412.	Sodium Sulphide	31,202		
413.	Sodium tetraborate	5		
414.	Sodium thiosulphate	10		
415.	Sodium tripolyphosphate	100,000		
416.	Sodium trisulphate	132,500		
417.	Sodiumhexa	5,000		
418.	Soft Agent	145,100		
419.	Soften AV-8	116,750		
420.	Softening Agent	683,100		
421.	Soil Release	2,000		
422.	Soluble starch	10		
423.	Solvent based Epoxy	5,000		
424.	Soya lecithine – mouillant	600		
425.	Spurso dispersing agent	1,250		
426.	Stabilizer(Powder)	5,500		
427.	Standard Supercel	3,973		
428.	Standolie -Linseed oil	1,000		
429.	Starch	100,000		
430.	Stearic acid	14,000		
431.	Stone washing powder	5,000		
432.	Strong primers	35,000		
433.	Sucrose analar	2		
434.	Sugar	148,000		
435.	Sulfate de baryum	6,001		
436.	Sulphur Black	58,000		
437.	Sulphur Powder	14,000		
438.	Sulphuric Acid 98%	1,139,200		
439.	Sunsolt	5,000		

No	Chemical Substances	Quantity		Other
		Kg	Litre	
440.	Super Ad-It/Nodex Extra 321/Fungicide	1,000		
441.	Super dilac		1,600	
442.	Superaid(F)	35,892		
443.	Sylosiv a4	100		
444.	Synolac 6811-Alkyd-Acide gras de Tall	3,000		
445.	Synthetic detergents	23,200		
446.	Talc 10 MOOS-0A10 / 120 MO-OA20	25,000		
447.	Talcum 35-37	60,200		
448.	Tebgitol NP	95,112		
449.	Texanol-Nexcoat	3,000		
450.	Texapon P.T	1,200		
451.	Thickener 40 (claytone 40)	1,000		
452.	Thinner	38,000		
453.	Thinner		93,632	
454.	Thrmoplastic rubber	20,000		
455.	Tin-Antimony Alloy	9,000		
456.	Titanium dioxide	142,000		
457.	Titanium Oxide	5,002		
458.	Titanium S.R.505	1,750		
459.	Toluene	126,000		
460.	TPR(Thermoplastic Rubber)	1,820,000		
461.	Treatex 225	425		
462.	Treating agent	9,600		
463.	Trichloroethylene	20,000		
464.	Triethanol amine	2,051		
465.	TS 100 – Flatting agent	2,000		
466.	Ucar polyphobe tr11	35,200		
467.	Unsaturated polyester resin	235,200		
468.	Urea	30,000		
469.	Urea glue (adhesive)	2,600		
470.	Urethanne- Uralac OR – Polystria PU base	450		
471.	UV absorber (chitex AP-20)	600		
472.	V8-anti ozone softener	6,000		
473.	Vinapas (for Skim Coat)	10,000		
474.	Vinyl Acetate	1,800		
475.	Viscoatex 46	1,000		

No	Chemical Substances	Quantity		Other
		Kg	Litre	
476.	VISCOPOL (Latex for Exterior.)	2,500		
477.	Wa scattering liquid	57,000		
478.	Wash Iron Sand	100,000		
479.	Water based Epoxy – base	3,000		
480.	Water repellent	1,000		
481.	Wax	277		
482.	Wetting agent	160,000		
483.	Whirlfloc WP-800	5,000		
484.	White Carbon	15,000		
485.	White spirit	73,700		
486.	Whitening agent	18,000		
487.	Xylene	5,500		
488.	Yellow iron oxide# 481	500,000		
489.	Zinc	10		
490.	Zinc Ingot	10,000		
491.	Zinc Oxide	17,000		
492.	Zinc stearic acid	100		
493.	Zinc sulphate	10		
	Total	36,238,225	338,965	

Source: Department of Industrial Standard, Ministry of Industry, Mines and Energy 2004,

2.5 METALS AND THEIR COMPOUND PRODUCTS

This section contains a list of metals and their compound products used as construction material and other finished products. In order to improve public and private construction, industrial machinering, and other infrastructure, and to respond to development demands, Cambodia must import metal and their compound products such as iron, steel, alluminium, zinc, lead, and copper and others in finished products. The data and information provided by the Department of CAMCONTROL regarding the importation of metals and their compound products are shown in Table 2-14 below:

Table 2-14: Metals and Their Compound Products, 2002

No	Chemical Substances	Quantity (tons)	Price (US$)	Imported Origin
1	Iron and Steel (construction and manufacture)	85,574.00	17,038,682.00	China, Vietnam, Singapore, USA, Thailand, Taiwan, Indonesia, Japan Honkong, India, Malaysia
2	Allumunium and its Products	6,319.82	11,188,428.00	China,Vietnam, Singapore,USA, Thailand, Taiwan, Indonesia, Japan Honkong, Arabia, Malaysia, Germany, Nicaragor, France, Australia, Italia, Japan , Greece, Sweeden
3	Zin and its Products	1,440.72	1,308,223.00	China,Vietnam, Singapore, Thailand, Taiwan, Japan, Hongkong

No	Chemical Substances	Quantity (tons)	Price (US$)	Imported Origin
4	Lead	2.56	9,055.00	China,Vietnam, Singapore, Thailand, Taiwan, Japan, Hongkong
5	Copper	64.65	219,085.00	China,Vietnam, Singapore,USA, Thailand, Taiwan, Indonesia, Japan Honkong, India, Malaysia, Germany, Belgium, Korea, UK, France, Italy, Australia, Denmark
	TOTAL	93,401.75	29,763,473.00	

Source: Statistic of Imported Good, Year 2002, Ministry of Commerce, Department of Camcontrol

2.6 MINERAL FUEL AND PETROLEUM PRODUCTS

Based on petroleum exploration and research in 1992, Cambodia has a high potential for natural gas and a modest potential for oil. One test well has yielded 133,000 cubic feet of gas and 180 barrels per day of light condensate crude (first State of Environment Report 2004, MoE). A tentative estimate of total offshore potential is 28,300-141,500 million cubic feet of gas and 30-180 million barrels of oil. Cambodia has not yet invested in petroleum exploitation. Before 1970, Cambodia had a refinery but it was destroyed by the Khmer Rouge regime (1975-1979) and has not been rebuilt. Therefore, almost all fuel and petroleum products for local supply are imported. The data and information provided by the Department of CAMCONTROL regarding the importation of mineral fuel and petroleum products are shown in Table 2-15 below:

Table 2-15: Mineral Fuel and Petroleum Products Imported, 2002

No	Chemical Substances	Quantity (tons)	Price (US$)	Imported Origin
1	Coal	39.50	1,374.00	Singapore, China, Hong Kong, Taiwan, Thailand, Malaysia, Japan, Germany, and France
2	Grease	199.68	175,913.00	
3	Diesel	367,259.96	84,839,545.00	
4	FO (Fuel Ol)	95,826.96	13,173,024.00	
5	Kerosene	41,447.90	8,586,315.00	
6	Kerosene for Airplane (JET A1)	22,661.67	3,960,936.00	
7	Lubricant Oil	60,521.28	7,316,725.00	
8	Natural Gas	27,016.65	8,387,550.00	
9	Gasoline	100,448.71	38,017,296.00	
10	Raw Material for Producing Lubricant	2,183.78	648,366.00	
	TOTAL	717,606.09	165,107,044.00	

Source: Statistic of Imported Good, Year 2002, Ministry of Commerce, Department of Camcontrol

2.7 CHEMICAL PRODUCTS FOR CONSUMER USE

Chemical products for consumers includes a wide variety of finished products used for cleaning, health care and protection used in households, public buildings, factories, offices, trade buildings, etc. Almost all chemical products for consumer use are imported, with a small amount produced domestically. According to information provided by CAMCONTROL, there are two kinds of chemical products used in households and public building: soaps (powder, liquid, and solid), and insecticides used for insect prevention, such as mosquitoe coils and sprays, anti-termite substances, etc. Table 2.16 shows the quantity of imported chemical products for consumer use in 2002:

Table 2-16: Chemical Substances for Consumer Use, 2002

No	Chemical Substances	Quantity (tons)	Price (US$)	Imported Origin
1	Chemical Substances for Consumer Use: Soaps, Organic Surface Active Agents	5,426.59	1,076,109.00	Vietnam, Thailand, Hong Kong, Malaysia, Singarpore, France, Hong Kong, China, Vietnam, Taiwan
2	Chemical Substances for Household Health Care	3,642.71	546,083.00	
	TOTAL	9,069.30	1,622,192.00	

Source: Statistic of Imported Good, Year 2002, Ministry of Commerce, Department of Camcontrol

2.8 CHEMICAL SUBSTANCS FOR LABORATORY

Currently, Cambodia has six sample governmental laboratories operating in the Ministry of Agriculture, Forestry and Fisheries laboratory; the Ministry of Commerce; the Ministry of Health; the Ministry of Industry, Mines and Energy; the Ministry of Environment; and the Ministry of Water Resource and Meteorology. While these laboratories have difference functions and responsibilities (see Chapter 9, below), they all use chemical substances imported by private companies. There are also small-scale private medical laboratories that have not been considered in this national profile. Table 2-17 shows chemical substances used in these six labratories.

Table 2-17: Chemical Substances Used In Government Laboratories

No	Chemicals	Ministerial Laboratories					
		MAFF	CAM	MoH	MIME	MoE	MWRM
1.	1,10 Phénanthroline Hydrate	x					
2.	1-butanol		x				
3.	1-propanol		x				
4.	2-propanol		x				
5.	Acacia					X	
6.	Acetaldehyde			x		X	
7.	Acetic Acid	x	x	x	x	X	x
8.	Acetic Anhydride	x		x			
9.	Acetone	x	x	x	x	X	
10.	Acetonitrile	x	x	x			
11.	Acid Acetylsalicylic			x			
12.	Acid Benzoic		x	x	x		
13.	Acid Boric	x	x	x	x	X	
14.	Acid Nitric	x	x	x	x		
15.	Acid Phosphoric, 85% Analar	x	x	x	x		
16.	Acid Trichloracetique			x			
17.	Alkaline Pepetone Water		x				
18.	Allylthiourea					x	
19.	Alpha Amylase Liquicolor			x			
20.	Aluminum Potassium Sulphate, 12-Hydrate			x	x	x	
21.	Aluminum sulfate octadecahydrate		x				
22.	Aluminon			x	x	x	
23.	Aluminum Ammonium (Sulfate Al)			x			x
24.	Aluminum Hydroxide Al $(OH)_3$			x			x

No	Chemicals	Ministerial Laboratories					
		MAFF	CAM	MoH	MIME	MoE	MWRM
25.	Amberlite IR-120(Na), Particle Size 0.30-1.18mm					x	
26.	Aminoantipyrin ; 4-[4-Aminophenazone]				x	x	
27.	Ammonia Solution	x			x	x	
28.	Ammonium Acetate	x	x		x	x	x
29.	Ammonium Chloride	x	x		x	x	x
30.	Ammonium Citrate (Di-Ammonium Hydrogencocitrate)			x			
31.	Ammonium Dihydrogenphosphate	x			x	x	
32.	Ammonium Hydroxide						x
33.	Ammonium Iron Sulphate	x	x		x	x	x
34.	Ammonium Iron(III) Sulfate 12-Hydrate		x			x	
35.	Ammonium Metavanadate	x		x		x	
36.	Ammonium Molydate	x	x		x	x	x
37.	Ammonium Nitrate					x	
38.	Ammonium Peroxide Sulphate					x	
39.	Ammonium Sulphamate, [Ammonium Amidosulfate]					x	
40.	Ammonium Sulphate	x			x		
41.	Amoxicillin 25ug(AMX)			x			
42.	Amoxilline-Clavulenic Acid (Amc)			x			
43.	Ampicilline (AM) 10ug			x			
44.	Anti-Bumping Granules					x	
45.	Antimony Potassium Oxide, (+) Tartrate					x	
46.	Antimony(III) Potassium Oxide, (+) Tartrate 0.5 Hydrate					x	
47.	Arsenic Standard Solution				x		
48.	Ascarite						x
49.	Ascorbic Acid			x	x	x	x
50.	Aslo-Latex			x			
51.	Bacitracin			x			
52.	Barbituric Acid					x	
53.	Barium Chloride		x		x	x	
54.	Barium Chromate				x		
55.	Barium hydroxide		x		x		
56.	barium sulfate		x		x		
57.	Bilirubine D+T			x			
58.	Billiary Salts			x			
59.	Bispyrazolon					x	
60.	Bouillon Lactose Bile Green						x
61.	Bouillon Lactose Poupre Bromocresol						x
62.	BPA (Baird Parker Agar)		x				
63.	Brain Heart Agar		x	x			
64.	Brain Heart Infusion Broth (Dehydrate)		x	x			
65.	Brilliant Cresyl Bleu			x			
66.	Bromocresol Green	x			x	x	x
67.	Bromophenol Blue					x	
68.	Brucine Hydrate				x		

No	Chemicals	Ministerial Laboratories					
		MAFF	CAM	MoH	MIME	MoE	MWRM
69.	Buffer Mixture Ph 4.0±0.02	x	x	x			
70.	Buffer Mixture Ph 7.0±0.02	x	x	x			
71.	Buffer Mixture Ph 9.0±0.02	x		x			
72.	Butyl Acetate		x	x	x	x	
73.	C, L, E, D Agar			x			
74.	Cadmium Coarse Powder, 0.3-1.6mm					x	x
75.	Cadmium Granulated GPR, 3-6mm				x	x	
76.	Cadmium Standard Solution		x		x		
77.	Calcium C.P.C			x			
78.	Calcium Carbonate	x	x		x	x	x
79.	Calcium Chloride	x	x			x	
80.	Calcium Hydroxide				x	x	
81.	Calcium Hypochlorite, (Bleaching Powder)					x	
82.	Calcium Liquicolor			x			
83.	Calcium Sulphate Dehydrate Precipitated	x	x			x	
84.	Calibration Standard For Ba						x
85.	Calibration Standard For Ca	x					x
86.	Calibration Standard For K	x					x
87.	Calibration Standard For Li	x					x
88.	Calibration Standard For Na	x					x
89.	Carbon Tetrachloride				x		
90.	Cefotaxime (CTX) 30ug			x			
91.	Ceftriaxone 30mcg			x			
92.	Charcoal Granular Activated					x	
93.	Chloramines				x	x	
94.	Chloramphenicol 3ug			x			
95.	Chlorhydric Acid	x	x		x		
96.	Chloroform	x		x		x	
97.	Chlorophenicol ; 4-					x	
98.	Cholesterol CHOD-PAP,Lliquicolor			x			
99.	Ciprofloxacin 5mcg			x			
100.	Citric Acid (Monohydrate), Powder	x	x		x	x	
101.	Ck-Nac Act			x			
102.	Cobalt Standard Solution		x		x		
103.	Cobalt(II) Chloride 6-Hydrate					x	
104.	Colistine 10mcg			x			
105.	Commercial Sodium Hypochlorite Solution				x		x
106.	Copper (Turning Cu)			x	x	x	
107.	Copper Powder, Precipitated					x	
108.	Copper standard solution, 1000 mg/L		x				
109.	Copper Sulphate	x	x		x	x	x
110.	Creactinine			x			
111.	Creatine			x			
112.	Creatine monohydrate		x				
113.	Chromium standard solution, 1000 mg/L		x				
114.	Cupferron GR [N-Nitroso-N-Phenylhydroxylamin Ammoniumsaiz]					x	

No	Chemicals	Ministerial Laboratories					
		MAFF	CAM	MoH	MIME	MoE	MWRM
115.	Curcumin Crystalline					x	
116.	Cyanide Solution Standard				x		
117.	Cyclohexanone			x		x	
118.	D(+) Galactose			x			
119.	D(+) Glucose Anhydride			x			
120.	Decaboxylase Medium Base		x				
121.	Detergent(MA 03 Sans Phosphate)						x
122.	Determine Hbs For Ag			x			
123.	Determine HIV 1+2			x			
124.	Determine Tm Syphilis Tp			x			
125.	Dextrin					x	
126.	Diammonium Hydrogen Citrate, [Ammonium Citrate Dibasic]					x	
127.	Diammonium Iron(II) Sulphate 6-Hydrate					x	
128.	Dichloroisocyanuric Acid Sodium Salt					x	
129.	Diethyldithiocarbamic Acid, Sodium Salt Trihydrate					x	
130.	Diethy ether		x		x		
131.	Diluents			x			
132.	Dimethylaminobenzaldehyde ; 4					x	
133.	Diphenylcarbazide ; 1,5				x	x	x
134.	Di-Potassium Hydrogen, Orthophosphate 3-Hydrate, Anhydrous				x	x	
135.	Di-Potassium Hydrogen Phosphate			x			
136.	Di-Sodium Hydrogen Orthophosphate, 2-Hydrate, Anhydrous					x	
137.	Di-sodium Hydrogen Phosphate, Dodecahydrate	x	x				
138.	Di-Sodium Peroxodisulphate					x	
139.	Di-Sodium Tetraborate Anhydrous, [Sodium Tetraborate Anhydrous]		x			x	
140.	Dithizone			x	x	x	
141.	Doxycycline 30ug			x			
142.	D. Mannitol		x				
143.	EC broth		x				
144.	Egg Yoke Emulsion 50%		x				
145.	Egg Yoke Telluride		x				
146.	Elisa Hbsag			x			
147.	Elisa Hcv			x			
148.	Elisa Hiv 1+2 Genscreen Version 2			x			
149.	Eosin Methylen Blue Agar		x	x			
150.	Eriochromcyanin R				x	x	
151.	Eriochrome Black T						x
152.	Erythromycin 15ug			x			
153.	Ethanol	x	x	x	x	x	x
154.	Ethanolamine			x		x	
155.	Ethyl Acetate Gpr	x	x	x			
156.	Ethylenediamine Tetra-Acetic Acide Disodium Salt [EDTA]		x	x	x	x	

No	Chemicals	Ministerial Laboratories					
		MAFF	CAM	MoH	MIME	MoE	MWRM
157.	Ethylenediaminetetraacetic Acid Disodium Salt Dehydrate	x	x	x			x
158.	Ethylenedianinetetraacetic Acid Magnesium Disodium Sal		x				x
159.	Exatrol N, P			x			
160.	Ferric chloride anhydrous 98%		x				
161.	Fluorescein Sodium [Uranin]					x	
162.	Fluoride Standard Solution				x		
163.	Formaldehyde		x				
164.	Formic Acid				x		x
165.	Fuchsine acid		x				
166.	Fuchsine basic		x		x		
167.	Gamma GT			x			
168.	Gentamycine 10ug			x			
169.	Giemsa			x			
170.	Giolitti Cantoni Broth		x				
171.	Glucose						x
172.	Glucose Anhydrous ; D(+)-			x		x	
173.	Glucose Bile Esculine, Sodium Azide						x
174.	Glucose Film			x			
175.	Glucose GOD-PAP			x			
176.	Glucose Liquicolor			x			
177.	Glucose Presion Electrode			x			
178.	Glutamic Acid ; (S)-(+)-					x	
179.	Glutaraldehyde Solution 50%					x	
180.	Glycerol GPR			x			
181.	Got Liquid Uv			x			
182.	Gpt			x			
183.	Gram Stain Kit			x			
184.	Hektoen (Gelose)			x			
185.	Hektoen Enteric Agar			x			
186.	Hexamine [Hexamethylenetetramine]					x	
187.	Hexane ; N-				x	x	
188.	Hydrazinesulphate						x
189.	Hydrazinium Sulphate, (Hydrazine Sulfate)					x	
190.	Hydrochloric Acid	x	x	x	x	x	x
191.	Hydrofluoric Acid			x		x	x
192.	Hydrogen Peroxide Solution 30%, and 6%	x		x		x	
193.	Hydroxylamine hydrochloride				x		x
194.	Hydroxyl ammonium Chloride		x		x	x	
195.	Hydroxyl ammonium Sulfate				x	x	
196.	Imidazol			x			
197.	Imipenem (IPM) 10ug			x			
198.	Immersion Oil			x			
199.	Immunofluorescence For Phneumocystis Carinil			x			
200.	Indian Ink			x			
201.	Indol Medium			x			

No	Chemicals	Ministerial Laboratories					
		MAFF	CAM	MoH	MIME	MoE	MWRM
202.	Iodine Indicator (Yodo Indicator)	x	x			x	
203.	Ion Exchange Powder (Mixed-Bed, For Cations & Anions)						x
204.	Iron III Chloride 6 Hydrate		x		x		
205.	Iron III Nitrate				x		
206.	Iron(II) Sulphate 7-Hydrate	x				x	
207.	Iron(III) Chloride 6-Hydrate, [Ferric Chloride Hexahydrate]				x	x	
208.	Iron standard solution, 1000 mg/L		x				
209.	Isobutyl Alcohol				x		x
210.	Kanamycine 10ug			x			
211.	King A and B Agar			x			
212.	Kliggle Hassan			x			
213.	L-Agrinine Hydrochloride		x				
214.	L(+) Lysine Hydrochloride			x			
215.	L+ Ornithine chlohydrate		x				
216.	Lactose			x			
217.	Lanthanum Chloride Heptahydrate and Solution		x			x	
218.	Lanthanum Oxide					x	x
219.	Larryl Sulphate Tryptose Broth			x			
220.	Latan chloride 7-hydrate		x				
221.	Lauryl Sulphate Broth		x				
222.	Lead Dithizone Reagent			x		x	
223.	Lead Standard Solution				x		
224.	Lead(II) Acetate 3hydrate		x	x	x	x	
225.	Lead(II) Carbonate					x	
226.	Lead(II) Nitrate					x	
227.	Lead IV oxide		x				
228.	Lincomycine 15mcg			x			
229.	Lithium Chloride Anhydrous	x				x	
230.	Lugol Solution For Microbiology, [Iodine Potassium Iodide]			x		x	
231.	Lyse			x			
232.	Lysine Desoxycholatebroth			x			
233.	L. Lysine		x				
234.	Macconkey-Broth			x			
235.	Manganese Standard Solution				x		
236.	Magnesium Chloride Anhydrous and Hexahydrate					x	
237.	Magnesium chloride 6-hydrate		x		x		
238.	Magnesium Citrate			x			
239.	Magnesium Nitrate Hexahydrate					x	
240.	Magnésium Nitrate Solution, (10mg-Mg/Ml, 15%-Nitrate)					x	
241.	Magnesium Oxide				x	x	
242.	Magnesium Sulphate 7-Hydrate		x		x	x	
243.	Malachite Green			x			
244.	Malachite Green Oxalate		x				

No	Chemicals	Ministerial Laboratories					
		MAFF	CAM	MoH	MIME	MoE	MWRM
245.	Manganese(II) Chloride 4-Hydrate					x	
246.	Manganese(II) Sulphate Monohydrate				x	x	
247.	Manitol Mobilite			x			
248.	Manitol Salt Agar			x			
249.	Manitol Selective Broth Base		x				
250.	Mecilinam (MC) 10ug			x			
251.	Mercaptoacetic Acid					x	
252.	Mercury					x	
253.	Mercury Nitrate						x
254.	Mercury standard solution, 1000 mg/L		x				
255.	Mercury(II) Chloride, Fine Crystals		x			x	
256.	Mercury(II) iodide		x				
257.	Mercury(II) oxide red		x				
258.	Mercury(II) Sulphate					x	
259.	Metacresol Purple					x	
260.	Metal-Free Triethanolamine,						x
261.	Methanol 99%	x	x	x		x	
262.	Methyl Orange		x	x	x	x	
263.	Methyl Red (Ph Indicator)	x	x				x
264.	Methyl-1-Phenyl-2-Pyrazolin-5-One ; 3-[3-Methyl-1-Phenol- 5-Pyrazolon]					x	
265.	Methylene blue chloride double salt		x				
266.	Methylene Blue Powder and Trihydrate			x			
267.	Methylpentan 2-One ; 4-					x	x
268.	Miniclean			x			
269.	Minidil LMG			x			
270.	Minoclaire			x			
271.	Monopotassium Phosphate			x			
272.	Morpholine					x	
273.	MRVP broth		x				
274.	Mueller Hinton Agar			x			
275.	Murexide						x
276.	Murexide [Ammonium Purpurate]					x	
277.	MYP (Bacillus cereus agar)		x				
278.	N-1-Naphthylethylenediamine Dihydrochloride					x	
279.	Nalidixic (NA) 30ug			x			
280.	Nickel standard solution, 1000 mg/L		x				
281.	Nickel(II) Nitrate Hexahydrate					x	
282.	Nickel (II) Nitrate Solution (10mg-Ni/Ml, 15%-Nitrate)					x	
283.	Nicotinic Acid					x	
284.	Nitrate Solution Standard 100ppm		x		x		
285.	Nitric Acid 98%, 68%, 65%		x	x	x		x
286.	Nitrophenol ; 4- [Or P-]				x	x	
287.	Nitrosor Salt				x		
288.	N-Naphtylethylenediamine Dihydrochloride						x

No	Chemicals	Ministerial Laboratories					
		MAFF	CAM	MoH	MIME	MoE	MWRM
289.	n-butyl acetate		x				
290.	n-propanol		x				
291.	NNN'N'-Tetramethyl-P-Phenylenedlamlne Dlhydrochlorlbe					x	
292.	Norfloxacine 10mcg			x			
293.	Novobiocin			x			
294.	Nutrient Agar		x	x			
295.	O.X (Oxidasee)			x			
296.	O.Nitriphenyl B.D. Galatopyranoside		x				
297.	Ofloxacine 5ug			x			
298.	Optochin			x			
299.	Orthoboric Acid Crystals[Boric Acid]	x				x	
300.	Orthophosphoric Acid 85%	x			x	x	
301.	Oxacilline 5ug			x			
302.	Oxalic Acid				x	x	x
303.	Oxalyldihydrazide					x	
304.	Pancreatic Peptone Of Casein			x			
305.	Pararosaniline Hydrochloride					x	
306.	Pasorex Crypto Plus			x			
307.	Pastorex Meningtis Meningo A			x			
308.	PCA (Plate Count Agar)		x				
309.	Penicillin 10 Unit			x			
310.	Pentyl Acetate					x	
311.	Peptone Bacteriological and Water			x			
312.	Petroleum Ether, 30-60ºc			x		x	
313.	Petroleum Spirit, 40-60ºc			x	x	x	
314.	Ph Electrode Soaker Bottle Solution					x	
315.	Ph Standard Buffer Solution (pH4.01) Solution (pH7.00) and (pH9.0)				x	x	
316.	Phenanthroline Hydrate ; 1,10-		x		x	x	
317.	Phenanthrolinium Chloride, Monohydrate; 1-10 phenantroline hydrate		x			x	
318.	Phenol			x	x	x	x
319.	Phenol Standard Solution			x	x		
320.	Phosphate Buffered Saline PBS			x	x		
321.	Phosphoric Acid	x	x		x		x
322.	Phosphotungstic Acid			x	x		
323.	Polymycine 300 unit			x			
324.	Polymysin B Sulphate		x				
325.	Polyvinylpyrrolidone			x		x	
326.	Potassium Dehydrogenate Phosphate			x			
327.	Potassium Liquicolor			x			
328.	Potassium Antimony (III) Oxide Tartrate						x
329.	Potassium Bicarbonate			x			
330.	Potassium Bromate		x		x	x	
331.	Potassium Bromide		x		x	x	
332.	Potassium Carbonate Anhydrous			x		x	
333.	Potassium Chloride	x			x	x	x

No	Chemicals	Ministerial Laboratories					
		MAFF	CAM	MoH	MIME	MoE	MWRM
334.	Potassium Chromate					x	x
335.	Potassium Cyanide 'Analar '					x	x
336.	Potassium Dichromate	x	x		x	x	
337.	Potassium Dehydrogenate Orthophosphate		x				
338.	Potassium Dehydrogenate Phosphate	x		x			x
339.	PotassiumDisulfite		x				
340.	Potassium Fluoride Anhydrous				x	x	
341.	Potassium Hexachloroplatinate(IV)				x	x	
342.	Potassium Hexacyanoferrate		x		x	x	
343.	Potassium Hydrogen Di-Iodate					x	
344.	Potassium Hydrogen Phthalate		x	x		x	x
345.	Potassium Hydrogen Phthalate, Primary Standard P.A.					x	
346.	Potassium Hydroxide		x	x	x	x	
347.	Potassium Iodide		x		x	x	x
348.	Potassium Iodine 98.5%		x				
349.	Potassium Nitrate	x	x		x	x	x
350.	Potassium Periodate				x		
351.	Potassium Permanganate (Not & low Hg)		x	x	x	x	x
352.	Potassium Peroxodisulphate		x		x		x
353.	Potassium Sodium (+)-Tartrare Crystalsand Powder				x	x	
354.	Potassium Sulphate		x	x	x	x	
355.	Pregnancy Test (25lu/HCG)			x			
356.	Propan-2-Ol			x		x	
357.	Pyridine				x	x	
358.	Pyrrolidine-1-Dithiocarboxylic Acid { * Store At +2ºc To +8ºc }					x	
359.	Pyruvic Acid Sodium Salt			x			
360.	Rabbit plasma with EDTA		x				
361.	Rapparot Vassiliadis Broth		x				
362.	Rheumatoid Factor-Latex			x			
363.	Ringer Solution						x
364.	Rosalic Acid				x		
365.	Rpr (Vdrl)			x			
366.	Sabouraud + Chloramphenicol			x			
367.	Safranine			x			
368.	Safranine O		x				
369.	Salicylic Acid					x	
370.	Secondary Antibody			x			
371.	Selective Supplement		x				
372.	Selenite Broth			x			
373.	Selenium powder		x				
374.	Silica Gel				x	x	x
375.	Silver Chloride					x	
376.	Silver Diethyldithiocarbamate					x	
377.	Silver Nitrate	x	x		x	x	x
378.	Silver Sulphate					x	

No	Chemicals	Ministerial Laboratories					
		MAFF	CAM	MoH	MIME	MoE	MWRM
379.	Sodium Acetate	x	x	x	x	x	
380.	Sodium Arsenate 7-Hydrate					x	
381.	Sodium Arsenate Solution, 0.05mol/L (0.1N), Volumetric Solution					x	
382.	Sodium Azide					x	x
383.	Sodium Bicarbonate	x		x			
384.	Sodium Borohydride					x	
385.	Sodium Carbonate Anhydrous	x	x	x	x	x	
386.	Sodium Chloride	x		x	x	x	x
387.	Sodium Cyanide 95%		x				
388.	Sodium Dihydrogen Orthophosphate monohydrate		x				
389.	Sodium Dihydrogen Orthophosphate 2 Hydrate				x		
390.	Sodium Disulfide		x				
391.	Sodium Dodecyl Sulphate					x	
392.	Sodium Fluoride	x			x	x	
393.	Sodium Fluorosilicate			x			x
394.	Sodium Glutamate			x			
395.	Sodium Hydrogen Carbonate	x	x			x	x
396.	Sodium Hydroxide		x	x	x	x	
397.	Sodium Hypochlorite (See Teepol Bleach)				x		
398.	Sodium Iodide					x	x
399.	Sodium Linear-Dodecylbenzene, Sulfonate Standard					x	
400.	Sodium Metasilicate					x	
401.	Sodium N,N-Diethyldithiocarbamate , Trihydrate				x	x	
402.	Sodium Nitrate	x	x		x	x	x
403.	Sodium Nitroprussode						x
404.	Sodium Oxalate		x		x	x	
405.	Sodium Salicylate					x	
406.	Sodium Starch Glycolate,						x
407.	Sodium Sulfate, Anhydrous		x	x	x		
408.	Sodium Sulphite Anhydrous		x		x	x	
409.	Sodium Thiocyanate		x				
410.	Sodium Thiosulphate 5-Hydrate		x			x	x
411.	Solochrome Black		x		x	x	
412.	Sorbic Acid		x				
413.	Spiramycine 100ug			x			
414.	Standard Solution - Cadmium 1000ppm		x		x	x	
415.	Standard Solution - Calcium 1000ppm	x				x	
416.	Standard Solution - Cesium 1000ppm					x	
417.	Standard Solution - Chromium 1000ppm		x			x	
418.	Standard Solution - Cobalt 1000ppm		x		x	x	
419.	Standard Solution - Copper 1000ppm		x		x	x	
420.	Standard Solution - Fluoride1000ppm				x	x	
421.	Standard Solution - Iron 1000ppm		x			x	
422.	Standard Solution - Lead 1000ppm		x		x	x	

No	Chemicals	Ministerial Laboratories					
		MAFF	CAM	MoH	MIME	MoE	MWRM
423.	Standard Solution - Lithium 1000ppm					x	
424.	Standard Solution - Magnesium 1000ppm	x				x	
425.	Standard Solution - Mercury 1000ppm		x			x	
426.	Standard Solution - Nickel 1000ppm	x	x			x	
427.	Standard Solution - Potassium 1000ppm	x				x	
428.	Standard Solution - Sodium 1000ppm	x				x	
429.	Standard Solution - Zinc 1000ppm				x	x	
430.	Streptomycin 10ug			x			
431.	Sucrose		x				
432.	Sulfanilic Acid, [4-Aminobenzenesulfonic Acid]					x	
433.	Sulfate Solution Standard				x		
434.	Sulphanilamide				x		x
435.	Sulphuric Acid		x		x	x	
436.	Tartaric Acid;Dextro-Rotatory				x	x	
437.	Tb Niacin Test Strip			x			
438.	Tetrahydrofuranne			x			
439.	Tetrationate Broth			x			
440.	Tetracycline 30ug			x			
441.	Thioglycolate With Rezasurin Broth			x			
442.	Thiourea					x	
443.	Thymol					x	
444.	Tin(II) Chloride Dehydrate				x	x	
445.	Tin(II) Chloride, 'Spectrosol L' (Low Mercury)					x	
446.	Tin-Granulated				x	x	
447.	Titan Yellow GR					x	
448.	Tri Sodium Phosphate			x		x	
449.	Triethanolamine	x				x	
450.	Triglyceride GPO			x			
451.	Trimetoprime 1.25x23,75			x			
452.	Tri-Sodium orthophosphate		x				
453.	Tri-Sodium Citrate			x		x	
454.	Triton X-100			x		x	
455.	Tryptone Water		x				
456.	Trypetone Soya Agar		x				
457.	Tryptone						x
458.	Tryptophane			x			
459.	Umatrol N and P			x			
460.	Urea			x			
461.	Urea Liquicolor			x			
462.	Uric Acid			x			
463.	Uric Acid Liquicolor			x			
464.	Urine Strip			x			
465.	Vibrio Cholerae Inaba		x				
466.	Vibrio Cholelae O1 Polyvalent		x				
467.	Xylene Cyanol						x
468.	Zielh Neelsen, Staining Set			x			

No	Chemicals	Ministerial Laboratories					
		MAFF	CAM	MoH	MIME	MoE	MWRM
469.	Zinc Granules / Pellets(3-8mm) /Powder	**x**				**x**	
470.	Zinc Sulphate					**x**	
471.	Zincon					**x**	
472.	Zirconium(IV) Oxide Chloride Octahydrate					**x**	
473.	Zirconyl Chloride Octahydrate					**x**	

Notes:

MAFF	Agronomical Laboratory
CAM	CAMCONTROL Laboratory
MoH	Ministry of Health Laboratory
MIME	Ministry of Industrial, Mine and Energy Laboratory
MoE	Ministry of Environment Laboratory
MWRM	Ministry of Water Resource and Meteorology Laboratory

2.9 CHEMICAL WASTES

Cambodia only has light industry, such as food processing and textiles, so it is assumed there are only small amounts of chemical wastes generated. In addition, those industries are required by law to install treatment facilities for controlling slugde wastes generated from multi-chemical use, in particular from dyeing industries and cleaning, medical wastes from pharmaceutical production, and active agents from infectious disease. Quantative chemical wastes data is provided by the Ministry of Environment and summarized in Table 2-18:

Table 2-18: Chemical Waste Generation and Trade

N	Type of Chemical Waste1	Average Generation (tons/year)	Export (tons/year)	Import (tons/year)
1	Industrial hazardous waste	6,939.00	-	-
2	Commercial and service waste	NA	-	-
3	Medical waste	801.82	-	-
4	Laboratory waste	NA	-	-
5	Port and shipping waste	NA	-	-
6	Community waste	NA	-	-
7	Agricultural waste	NA	-	-
	Total	7,740.82	-	-

Source: Ministry of Environment, Department of Pollution Control 2003

2.10 PERSISTENT ORGANIC POLLUTANTS (POPs)

2.10.1 POPs Pesticides

Among the nine POPs pesticides internationally banned by the Stockholm Convention (Aldrin, Chlordane, DDT, Dieldrin, Endrin, Heptachlor, Hexachlorobenzene, Mirex, and Toxaphene), DDT and Endrin are very popular with Cambodian users. Most Cambodian farmers mistakenly believe that all pesticides in powder form are considered “DDT” and all liquid pesticides are “endrin.” Other than DDT and endrin, Cambodians use other POPs pesticides (for example, chlordane and heptachlor, as observed in the markets) but data has not been recorded.

Based on data and information provided by the Ministry of Agriculture, Forestry, and Fisheries, from 1985 to 1990, governmental enterprises were responsible for importing and distributing agricultural pesticides consisting of 1.2 tons of DDT and 1,900 liters of endrin.

Recognizing the hazardous nature of chemical pesticides; the Royal Government of Cambodia has banned 116 pesticides, including the nine POPs pesticides listed by the Stockholm Convention.

Based on the preliminary POPs inventory results in early 2004 (as prepared as part of the development of the National Implementation Plan for the Stockholm Convention), POPs pesticides, including 350 kg of DDT and 59 kg of chlordane, are available in some markets, but stockpiles of those POPs pesticides have not been found, illustrating that a little amount of POPs pesticides is smuggled from neighboring countries over uncontrollable border areas.

2.10.2 POPs PCBs (Polychlorinated Biphenyls, PCBs)

PCBs are one of twelve POPs substances covered by the Stockholm Convention. In general, PCBs are used as fluid in electrical equipment such as transformers, capacitors, condensers, electrical switchs, cables, etc. Information provided by the Ministry of Industry, Mines and Energy and the Electricité du Cambodge (Cambodia Electrical Company) indicates that almost all electrical equipment was imported after 1906, when the French Electrical Company invested in the Cambodian electricity sector, and all products have continued to be imported. However, the statistical data on imports and information on electrical equipment use are rarely found because in the past officials were not interested in equipment contaminated with PCBs.

After the Stockholm Convention was signed (May 23, 2001), under technical assistance from UNEP and funded by GEF, the Royal Government of Cambodia conducted a national inventory to identify PCBs present in transformers. It found 1,600 transformers in use throughout the country. These transformers were imported during different periods and continue to be used, as shown below:

Pre-1970	Mostly imported from France and Japan with the quantity of about 300 (still in use).
1970-1983	Within this period, transformers were mostly import from France, Japan, Germany, Yugoslavia, and the former Soviet Union with the quantity of about 200 (still in use).
Post-1983	Mostly imported from former Soviet Union, Eastern European countries, France, South Korea, Thailand, Japan, Romania, Italy, and Vietnam; it is estimated that about 1,100 power transformers were imported during this period (still in use).

Among the recorded equipment, about 50% (approximately 800 transformers) are assumed to contain or are contaminated with PCB substances. Note that the first assumption of PCB contamination in transformer fluid is based on transformer classification by age, by use status, and by disposable test kits (PCBs screening kit). However, we are not able to identify PCB contamination in electrical equipment because Cambodia laboratories have very limited capacity for analyzing PCB substances.

In Cambodia, there are no specific laws, legal instruments, or any provision for such legal instruments to eliminate or to prohibit the import, use, and disposal of PCBs. Currently the are no widespread guidelines for the disposal of old transformers and no up-to-date facilities for cleaning, stocking, and destroying PCB waste or equipment contaminated by PCBs. It is a common practice to reuse fluid from inoperable transformers and then extract metal substances for recycling. Of concern is the negative impact on human health and the environment when such “recycled” fluid is used to paint furniture, as oil for sewing machines, burned for energy supply, and other activities.

2.10.3 POPs DDT for Public Health Control

DDT is one of twelve POPs substances to be covered by the Stockholm Convention. In Cambodia, DDT is not only used for agricultural purposes but also used for public health control programs, especially to eradicate vector born diseases. The first use of DDT in public health was in 1953 as a pilot study in a malaria endemic area and was then extended, from 1955-68, to other areas to eradicate malaria. DDT was also used

during the Cambodia civil war from 1970-75. Data and information related to the total quantity of DDT used and the areas applied with DDT is not available.

In the book "The Pol Pot Regime," Ben Kiernan states on page 146 that the first shipment during the 1975-79 era was from Hong Kong, consisting of 840 tons of DDT. However, details on the quantity distributed and its use is not available.
Since 1980, public health control programs have targeted Malaria and dengue hemorrhords fever (DHF) at the town and rural areas by using 20 tons of DDT that remained from the Khmer Rouge era. From 1981 to 1987, about 120 tons of DDT was imported from the former Soviet Union and Holland for supporting programs to fight against the vectors of Malaria and DHF throughout the country. DDT was also used at refugee camps by UNHCR (United Nation High Commission for Refugee) along the Cambodia-Thailand border, but quantity and exact areas applied remain unknown.

Since 1987, Cambodia has stopped importing and stopped using DDT as a major tool for controlling vector born disease with the exception of use at rubber plantations, which stopped in 1991. The action to stop using DDT is not covered by any national regulation but based on WHO's recommendation in 1986 and alternative chemicals for vector born disease control, i.e. Deltamethrin, Permethrin and Pyritroil. Cambodia will not commit to any act in the future for reusing DDT.

The exact quantity of DDT distributed and used is unknown, since no records have been found. However, interviews with former DDT supervisors indicate that about 143 tons of DDT was distributed to provinces and municipalities during 1980-87. The amount of DDT distribution and date, and other distribution information on the DDT delivered throughout Cambodia is illustrated in the tables 2-19 as follows.

Table 2-19: Amount of DDT distribution and delivered date by provinces

No	PROVINCE	Delivered year	last year of application	Quantity (tons)	Purpose of DDT use: controlling
1.	Bantey Mean Chey	1980	1987	11	Malaria and DHF vector
2.	Battambang	1980	1987	10	Malaria and DHF vector
3.	Kampot	1980	1986	1	Malaria vector
4.	Kandal	1981	1987	5	Malaria and DHF vector
5.	Kep city (in Kampot)	1980	1986	-	Malaria vector
6.	Kampong Cham	1981	1991	5	Malaria and DHF vector
7.	Kampong Chhnang	1980	1987	13	Malaria and DHF vector
8.	Kampong Speu	1980	1986	5	Malaria and DHF vector
9.	Kampong Thom	1981	1986	5	Malaria and DHF vector
10.	Koh Kong	1980	1986	3	Malaria vector
11.	Kratie	1981	1986	5	Malaria vector
12.	Mondulkiri	1980	1986	1	Malaria vector
13.	Oddar Mean Chey (as Siem Reap)	1980	1985	-	Malaria vector
14.	Pailin City	1980	1991	4	Malaria vector and fly
15.	Phnom Penh	1981	1986	3	Malaria and DHF vector, Fly
16.	Preah Vihear	1981	1986	2	Malaria vector
17.	Prey Veng	1980	1986	5	Malaria and DHF vector
18.	Pursat	1980	1985	11	Malaria and DHF vector
19.	Rotanakiri	1980	1987	3	Malaria vector
20.	Siem Reap	1980	1985	11	Malaria vector
21.	Sihanoukville	1981	1986	0.5	Malaria and DHF vector

No	PROVINCE	Delivered year	last year of application	Quantity (tons)	Purpose of DDT use: controlling
22.	Stun Treng	1980	1986	3	Malaria vector
23.	Svay Rieng	1981	1987	4	Malaria and DHF vector
24.	Takeo	1981	1987	4	Malaria vector
25.	Rubber Plantation *	1981	1986	28.5	Malaria vector
	Total			143	

Source: Inventory survey records, June 2004, DDT Task Team

***Note**: * Rubber plantations were considered separate entities for the purposes of the province or municipality for this survey.*

2.10.4 Unintentionally POPs By-Products

This topic focuses on two organic substances, Dioxins and Furans, which are included in the twelve POPs substances to be covered by the Stockholm Convention. Dioxins and Furans are by-products generated during some industrial chemicals production processes or unintentionally produced by burning certain substances. Both contribute high risk to health and the environment.

A POPs by-products inventory in 2004 showed that Cambodia has high potential for generating and releasing Dioxins/Furans from such sources such as:

- Uncontrolled combustion process: Landfill fires, households' waste fires, forest fires, burning of agricultural post-harvest residues, etc.,
- Medical waste incineration without air cleaning facilities,
- Power generation plant, generating electricity by using oil and autoclave kiln operated by waste burning, and
- Ferrous and non-ferrous metal production.

Based on UNEP guidelines for calculation of Dioxins/Furans release, the Cambodian Ministry of Environment conducted the inventory to estimate the generation and release of Dioxins/Furans into the environment. The inventory estimated that Dioxins/Furans are released in the amount of 606.664 g TEQ/annual. The results of the inventory are elaborated in Table 2-20 below.

Table 2-20: Annual Amount of Dioxins/Furans Releases from Main Sources (Inventory Report 2004)

Category	Source Categories	Annual Releases (g TEQ/a)					
		Air	Water	Land	Product	Residues	Total
1	Uncontrolled combustion processes	217.87	0.00	14.56	0.00	315.60	548.031
2	Medical waste incineration	40.73	0.00	0.00	0.00	0.781	41.511
3	Power generation and heating	10.275	0.00	0.00	0.00	1.692	11.967
4	Ferrous and non-ferrous metal production	0.41	0.00	0.00	0.00	1.0	1.41
5	Production of mineral products	0.099	0.00	0.00	0.00	0.00	0.099
6	Transport	0.005	0.00	0.00	0.00	0.00	0.005
7	Miscellaneous	3.641	0.00	0.00	0.00	0.00	3.641
1-7	Total	273.031	0.00	14.56	0.00	319.073	606.664

Source: Inventory Report on Dioxins/Furans, July 2004, By-Product Task Team

2.11 CHEMICAL USE BY CATEGORIES

Comment [BT1]: one sentence introducing this table.

Table 2-21: Summary Total Chemical Production and Trade (2002)

Chemical Type	Production/ Manufacturing		Imports		Formulation/ Packaging		Exports	
	Qty (tons/year)	Value (US$)	Qty (tons/year)	Value (US$)	Qty (tons/tear)	Value (US$)	Qty (tons/year)	Value (US$)
Fertilizers	-	-	45,335.00	4,651,293.00	-	-	-	-
Pesticides	-	-	198.46	225,856.00	-	-	-	-
Chemical for Pharmaceutical Production	-	-	74,032.03	41,209,186.00	-	-	-	-
Industrial Chemical Raw Materials	-	-	54,895.77	10,709,254.00	-	-	-	-
Metals and their compound products	-	-	151,279.73	31,127,204.00	-	-	-	-
Petroleum Products	-	-	918,450.90	241,110,372.00	-	-	-	-
Chemical products for consumer use (insecticides-consumer use)	-	-	9,069.30	1,622,192.00	-	-	-	-
Chemical substances for laboratories	-	-	NA	NA	-	-	-	-
Other chemical	-	-	NA	NA	-	-	-	-
Chemical Waste	7,740.82	-	NA	NA	-	-	-	-
Specific for Persistent Organic Pollutants (POP)	-	-	NA	NA	-	-	-	-
TOTAL	7,740.82	-	1,253,261.19	330,655,357.00	-	-	-	-

CHAPTER 3
PRIORITY CONCERNS RELATED TO CHEMICAL PRODUCTION, IMPORT, EXPORT AND USE

This chapter provides an overview of the nature of problems associated with chemical production, trade and use, and the disposal of chemicals. This chapter also identified the priority concerns related to chemicals and its affect on public health and the Cambodian environment, which are serious concerns in Cambodia society.

3.1 OVERVIEW OF COMMON PROBLEMS RELATED TO CHEMICALS

In developing countries like Cambodia, the chemical importation, transportation and use which are of most concern relate to pesticides, raw material for medical products, raw material for industrial, hazardous chemical contaminated in equipment, chemical products for household use, and chemical wastes. In Cambodia, there has not been a comprehensive study or any estimates on chemical use and related issues. There is no identification concerning the amount of chemicals used or chemical poisoning in any area. Therefore, the identified problems or concerns related to chemicals use in Cambodia are based only on visible observation and conclusions from various documents but without scientific survey findings.

It should not be concluded that Cambodia does not have concerns with chemicals just because its tools for chemical problems assessment are inadequate. Quite the contrary: Cambodian people face high risks and lack awareness on the effects caused by chemical hazards and chemicals use, especially those caused by toxic and/or hazardous chemicals in businesses, their communities, and their households. Cambodian people not only face dangers through direct use of chemicals, but also in residues accumulated in food products, which can affect people's health.

For the past several years, Cambodia has produced less rice than is sufficient to feed its people. Strategies to achieve crop intensification include the increased use of improved rice varieties, improving soil fertility, and improving irrigation. Often, the use of pesticides is encouraged to protect crops and increase yields. However, misuse of pesticides may result directly in pest problems where they previously did not exist. At the same time, misuse will further lead to health and environmental problems. In Cambodia, where more than 80% of the population are farmers, most of them use dangerous chemical substances for their agriculture with ignorance of the threat to their health and environment. Estimates are that chemical substances are used in greater volumes in Cambodia's agricultural production than in industry. Many chemicals sold in Cambodia are banned in their country of origin.

Chemical substances as raw material for industrial production and chemical products for household use have a detrimental effect on public health, especially workers in factories and direct users. Due to lack of awareness on the perception of the hazards of chemicals, vulnerable people, such as workers who are handling chemicals, hardly ever use safety equipment. Specific chemical household products such as cosmetics and insecticides are imported and freely marketed without official quality assurance and safety instructions; all too often, children come into contact with harmful chemicals. Some chemical products are directly applied to food and food products to make them attractive, to prolong shelf-life, and to prevent insect damage.

In summary, Cambodia faces dangerous problems caused by chemicals for both peoples' health and the environment. But all those dangerous problems had not been specifically identified with analytical results due to the long-term nature of many chemical hazzards, the lack of systematical assessment tools and facilities, and the fact that existing assessment results are based only on general observation. The following table provides a brief description of problems related to chemicals in Cambodia.

Table 3-1: Description of Problem Areas

Nature of Problem	City/Region	Problem Description	Chemical(s)/Pollutant(s)

Nature of Problem	City/Region	Problem Description	Chemical(s)/Pollutant(s)
Impact on farmers' health who use pesticides	Rural(farm and paddy field)	Weak health, strange disease and skin disease	Pesticides
Impact on workers' health who handle chemicals	City and provincial town	Weak health, respiration disease and liver disease	Acids, bases and dissolved substances
Impact on people's health who use chemical cosmic products	City and rural areas	Skin disease	Mercury and Hydrodioxide
Impact on people's health who use pesticides in the home or office	City and rural areas	Cough and respiration disease	Pesticides
Impact on people health who consume chemical contaminated foodstuffs.	City and rural areas	Weak and diseased organs including liver disease	Pesticides and food additive

3.2 PRIORITY CONCERNS RELATED TO CHEMICALS IMPORT, PRODUCTION AND USE

Cambodia has a lack of chemical data, information, records of chemicals assessment, and base referencees for identification of the nature of problems related to chemicals. From the experiences of government technical officers in chemicals management and other general observers, the priority concerns related to chemicals have been identified and summarized in the following table.

Table 3-2: Priority Concerns Related to Chemicals

Nature of problem	Scope of problem	Level of concern	Ability to control problem	Availability of statistical data	Specific chemicals creating concerns	Priority
Air pollution	Regional	Low	Low	NA	Pb, PM10	4
Pollution of inland waterways	Regional	Medium	Medium	Insufficient	-	3
Marine pollution	Local	Low	Low	NA	-	4
Ground-water pollution	Local	Medium	Low	Insufficient	Arsenic, NO_2	3
Soil contamination	Local	Low	Low	NA	-	4
Chemical residues in Food	National	High	Low	Insufficient*	Pesticide residue	2
Drinking water pollution	National	Medium	Low	Insufficient	Arsenic, NO_2	3
Hazardous waste treatment/disposal	Local	Medium	Low	Insufficient	Lead Battery	3
Occupational health: agriculture	Regional	High	Low	NA	Pesticides	2
Occupational health: industrial	Local	High	Low	NA	-	2
Public health	National	Medium	Medium	NA	General	2
Chemical accidents:industrial	Local	Medium	Low	NA	-	3
Chemical accidents:transport	Local	High	Low	NA	-	3
Unknown chemical imports **	National	High	Low	NA	Pesticides & industrial chemeicals	2
Storage/Disposal of obsolete chemicals	National	Medium	Low	Insufficient	-	3
Chemical poisoning/suicides	Local	Low	Low	NA	Pesticides	4
Persistent organic pollutants	Regional	Medium	Low	Insufficient	PCBs, Endrin, DDT, By-Products	3

Note:
- Local — Scope of problem identified around the village or commune area
- Regional — Scope of problem identified around the district or provincial area
- National — Scope of problem identified around the country area
- 1 — Most serious problem(s)
- 2 — Most severe problem(s)

3 Medium
4 Low
5 Very low
* Informed indicator
** Implementation level to follow the PIC convention

3.3 COMMEMTS/ANALYSIS

Currently, governmental institutions do not have sufficient ability to conduct chemicals assessment and the identification of chemicals-related problems in the production, trade, storage, use, and disposal of such chemicals. This is because Cambodia does not have a clear chemicals management goal and coupled with a limited capacity for assessing chemical hazards and identifying their impacts.

Basic chemicals data and information used in the identification of chemicals-related priority concerns are almost not available. Therefore, to facilitate the identification of chemicals-related priority concerns, the national mechanism for managing chemicals data, information, and recording of the marketing of chemicals and their use should be established.

We have had already shown that Cambodia is not a chemicals producer or exporter; chemicals-related problems in Cambodia generally have little effect on neighboring countries or the region. Chemical pollution release sources and its proliferation are on a small-scale if compared with neighboring counties.

Cambodia lacks strong cooperation in terms of chemicals management among its government institutions, for example, there is not a preference or commitment to develop a memorandum of understanding and/or significant agreement between the governmental institutions. Indeed, if such memoranda and/or agreements did exist, it would have relatively ineffective results due to unclear roles of responsibility, vague scopes of work to be performed, and insufficient resources for implementation of obligations.

CHAPTER 4
LEGAL INSTRUMENTS AND NON-REGULATORY MECHANISMS FOR MANAGING CHEMICALS

This chapter provides an overview of existing Cambodian legal instruments and non-regulatory mechanisms for managing chemicals, including their implementation and enforcement. This chapter also provides non-regulatory mechanism activities relevant to the improvement of chemicals management and the identification of the strengths, weaknesses, and gaps in these legal instruments.

In general, chemicals consist of difference kinds, difference groups, and long cycle stages from production, formulation, storage, transportation, distribution/marketing, use/handling, and finally, disposal. This is a main reason why there needs to be participation and agrrement between the institutions managing chemicals. In another words, there has to be laws, regulations, and standards in place for the management of chemicals in each stage of the life cycle. Therefore, some laws, regulations, and standards have the same specific objectives and interrelation, e.g. transportation law, health protection law, and environmental law have the same provisions concerning the management of hazardous chemicals but the activities to be performed are different.

4.1 OVERVIEW OF NATIONAL LEGAL INSTRUMENTS WHICH ADDRESS THE MANAGEMENT OF CHEMICAL

After the first national election in 1993, the Royal Government of Cambodia was determined to reach to a free market economy for all sectors of the country's development, including commercial and industrial sectors in particular. As a result, the demand for chemicals in the agricultural sector, in industry, and for household use has increased in the last 10 years. Based on the social development situation and in order to ensure management of chemicals for the people's health and the environment, the Royal Government of Cambodia has developed laws, decrees, orders, standards, and other regulations for managing chemicals. These legal instruments provide measures to mitigate the negative impact that can occur during each stage of a chemical's life cycle from production, import, export, distribution/marketing, use/handling, and to disposal.

The short-term preparation of legal instruments in response to the requirements of the country and associated with the limited experiences in both the legal aspect and the technical aspect in managing chemicals has caused some of these legal instruments to have gaps; for example, some do not have detailed descriptions regarding a chemical's control/monitoring, which makes it difficult to enforce the laws or causes ineffective compliance.

Cambodia legal instruments for provisional compliance or problem solving related to chemicals management are summarized in Table 4.1 below:

Table 4-1: References to Existing Legal Instruments that Address the Management of Chemicals

No	Legal instrument (type, reference, year)	Responsible ministries or bodies	Chemicals & categories covered	Objective of legislation	Aarticle/provision
1.	Constitution of the Kingdom of Cambodia; September 24, 1993	State	Mineral chemicals, and chemical drugs	Protect state property, natural resource and environment. Against drug use, exploitation of fraud related to products quality aim to protect people health.	Article 59, and 64
2.	Law-Degree No 33 on Fishery Management; March 09, 1987	Ministry of Agriculture, Forestry and Fisheries	Gunpowder, explosives or any kind of poisonous substances	Protect fisheries resource through strictly prohibited all toxic chemicals, gun powders, and explosives using for fishing activities.	Article 17
3.	Prvisions Relating To The Judiciary and Criminal Law and Procedure Applicable In Cambodia During The Transitional Period; September 10, 1992	Ministry of Justice	Narcotic drugs substance	Prohibited the production, import, sale, and the use of Narcotic drugs.	Article 39 (paragraph 1), and 65
4.	Law on Environmental Protection and Natural Resources Management; December 24, 1996	Ministry of Environment	Toxic chemicals and hazardous waste	Protect environmental quality; Prevent the environmental pollution through conducting environmental impact assessment for development projects; Manage chemicals and hazardous waste.	Article 6 (paragraph 1), 8, 12, and 13
5.	Law On Pharmaceuticals Management; May 09, 1996	Ministry of Health	Chemicals substances for pharmaceutical production and pharmaceutical products	Control of pharmaceutical production, and exploitation aim to protect users' health and avoid the impact from obsolete and fraud of pharmaceutical products.	Article 5, 8 (paragraph 1and 2), 10, and 12
6.	Law On the Control of Drugs; January 24, 1997	Ministry of Interior, and Ministry of Health	Chemicals substance for narcotic drugs production	Prohibited the production, import, sell and use narcotic drugs.	Article 3, 8, 9, 12, and 13
7.	Law on the Management of Quality And Safety of Products and Services, June 21, 2000	Ministry of Commerce	All products and goods	Ensure public health care and protect users (safety of the customers); Ensure fair trade business products, service, and food products in particular.	Article 6, 7, and 27
8.	Sub-Degree 69 On Standard and Management of Agricultural Materials; October 28, 1998	Ministry of Agriculture, Forestry and Fisheries and Ministry of Environment	Chemical fertilizers and pesticides	Control all any activity related to chemical fertilizers and pesticides such as: production, import, export, transport, distribution, sell, stock, disposal, and destroy.	Article 4, 16, 18, and 24
9.	Sub-Degree No 72, on The Environment Impact Assessment Process August 11, 1999	Ministry of Environment	All chemical substances	Determine measure to prevent the environmental pollution and public health impact caused by development projects.	Article 3, 4
10.	Sub-Degree No 37, on Solid Waste Management April 27, 1999	Ministry of Environment	Chemicals substances, chemical wastes, and hazardous wastes specified in the Basel Convention	Control all activities related to solid waste and hazardous waste generation and disposal.	Article 3, 15, 17, 20, 21, 24, 25, 26
11.	Sub-Degree No 27, on Water Pollution Control : April 06, 1999	Ministry of Environment	Chemicals substances, chemical wastes, and hazardous wastes	Control all activities can be caused the water pollution and to regulated the level of water pollutants release.	Article 6, 8, 9, 10, 11
12.	Sub Degree on Air and Noise Pollution Control; July 10, 2000	Ministry of Environment	Radioactive substances, production of flammable substance and air pollutant substances	Control all activities can be caused the air pollution, and noise pollution and to regulate the level of air pollutants release.	Article 8, 10, 14
13.	Sub-Decree on the industrial Standardization of Cambodia No 42; May 15, 2001	Ministry of Industry Mines and Energy	Chemical substances for industrial production	Develop and control the use of industrial products standard; and Improve the quality of industrial products and public safety and build trust for investors.	Article 5

4.2 SUMMARY DESCRIPTION OF KEY LEGAL INSTRUMENT RELATED TO CHEMICALS

Based on Table 4-1 above, we can see that while Cambodia has no specific law for general chemicals management, there are several chemicals and chemical groups (listed in Table 2-5, Table 2-6 and Table 4-4) that are regulated. Table 4-2 summarizes the procedure related to managing and controlling such substances chemicals.

- **Legal Instruments Dissemination**

In general, the legal instruments after approval are announced by the Royal Government of Cambodia or by the institution responsible for implementation and enforcement through information announcement, copying of the legal documents, and declaration through radio, television, and newspaper. However, in practice the dissemination mechanism has not been comprehensively implemented, since it is impossible to disseminate all legal instruments to the society at large; most of targeted audiences are the governmental officials who deal directly with implementation of such legal instruments through workshops and meetings. Other relevant institutions and stakeholders received a little information disseminated only through the workshop or meeting and copied materials.

Table 4-2: Legal Instruments Related to Chemicals Management

Procedure	Legal instrument and description	Chemical/category
Registration	Article 4 (Sub-Degree 69 On Starndard and Management of Agricultural Materials): Fertilizers of all kinds that can be sold in the Kingdom of Cambodia shall be registered with the Ministry of Agriculture, Forestry, and Fisheries, even though they have been imported or produced in the country.	Chemicals fertilizers
	Article 12 (Sub-Degree 69 On Starndard and Management of Agricultural Materials): Natural or legal persons who have performed or are performing or want to perform the business of pesticidess shall be registered and authorized by the Ministry of Agriculture, Forestry and Fisheries.	List of pesticides permitted for use in Table 2-5, Chater II
	Article 13 (Sub-Degree 69 On Starndard and Management of Agricultural Materials): Pesticidess registered with the Ministry of Agriculture, Forestry, and Fisheries are: 1. Pesticidess being circulated for sale in the markets of the Kingdom of Cambodia but have not been mentioned in the notice of authorization to be temporarily used by the Ministry of Agriculture, Forestry and Fisheries. 2. Pesticidess mentioned in the list of items authorized to use by the Ministry of Agriculture, Forestry and Fisheries. 3. New pesticidess not mentioned in the 1st classification according to the WHO. 4. Pesticidess already registered by have changed the formulae or trade names.	List of pesticides permitted for use in Table 2-5, Chater II
Permitting	Article 8 (Law On Pharmaceuticals Management): 1- There shall be authorization from the Ministry of Health for: • The opening, closing or changing of installation of pharmacy, establishment of pharmaceutical production and import export of medicines, • The business of import-export of medicines, • Importing and exporting stocks of medicines and raw materials for producing medicines, • Pharmaceutical dissemination. 2- Pharmaceutical production and import-export business in veterinary field are determined by joint notice from Ministry of Health and Ministry of Agriculture, Forestry, Fisheries. 3- In a drug store the pharmacist's presence is necessary. In case of absence there shall be substitute who appropriately meets the conditions imposed by the Ministry of Health.	Chemicals for pharmaceutical production and pharmaceutical products
	Article 6: (Law on the Management of Quality And Safety of Products and Services): When the products, goods, or services could harm the health or safety of consumers, their manufacturing and commercialization shall be subject to a prior submission of a declaration to the competent institutions and have a prior authorization by the competent institutions following an inspection and an indication of usage guidelines in Khmer language.	Products and goods without nomenclature listed
	Article 5 (Sub-Degree 69 On Starndard and Management of Agricultural Materials): A natural person or a legal person or any company that wants to produce or import or export fertilizers shall have authorization from the Ministry of Agriculture, Forestry and Fisheries	Chemical fertilizers
	Article 10: (Sub-Degree 69 On Starndard and Management of Agricultural Materials): The sale of non-specific fertilizer or fertilizer with poor quality shall be authorized by the Ministry of Agriculture, Forestry and Fisheries and shall be performed according to the instructions of the Ministry of Agriculture, Forestry and Fisheries Ministry of Agriculture, Forestry and Fisheries on the business of those fertilizers.	Chemical fertilizers
	Article 20 (Sub-Degree 69 On Starndard and Management of Agricultural Materials): New wrapping up of pesticidess is forbidden. New wrapping up can be performed only when there is authorization from Ministry of Agriculture, Forestry and Fisheries. The pouring or putting of part of pesticides into bottles or bags or materials for wrapping up good or beverage shall be strictly forbidden.	
	Article 22 (Sub-Degree 69 On Starndard and Management of Agricultural Materials): The manner and conditions to keep pesticidess shall be determined by Ministry of Agriculture, Forestry and Fisheries. The installation of warehouse for keeping pesticidess shall be authorized by the Ministry of Agriculture, Forestry and Fisheries with approval from Ministry of Environment.	

Procedure	Legal instrument and description	Chemical/category
	Article 23 (Sub-Degree 69 On Starndard and Management of Agricultural Materials): The disposal and destruction of remnants or materials for wrapping up pesticidess of businessmen shall be authorized by Ministry of Agriculture, Forestry and Fisheries with approval from Ministry of Environment.	
	Article 24 (Sub-Degree 69 On Starndard and Management of Agricultural Materials): All advertisements on pesticidess through any means shall be authorized by Ministry of Agriculture, Forestry and Fisheries. Can be authorized only pesticidess that have already been fully registered.	List of pesticides permitted for use in Table 2-5, Chater II
	Article 20 (Sub-Degree No 37, on Solid Waste Management): The exportation of the hazardous waste from the Kingdom of Cambodia to abroad could be conducted if there are an agreement from the Ministry of Environment, export license from the Ministry of Trade, and permit from the import country. The exportation of the hazardous waste shall be consistent with the provisions and principles of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal in1989 which come into force on May 05, 1992.	List of hazardous waste completely based on annex of Basel Convention
	Article 10 (Sub-Degree No 27, on Water Pollution Control): The discharge or transport of wastewater from any SOURCE of pollution to other places for any purpose is subject to prior permit from the Ministry of Environment. The application for this permit shall be copied to the concerned ministries or agencies.	
	Article 14 (Sub Degree No 42 on Air and Noise Pollution Control): The asking of an import permission of flammable substances shall be attached the analytical result which emphasized the quantity of pollutant: S, Pb, C_6H_6 and Hydrocarbon from original source of importation or production	S, Pb, C6H6 and Hydrocarbon
Labelling	Article 8 (Sub-Degree 69 On Starndard and Management of Agricultural Materials): Every bag shall be labeled to giver sufficient clear information in Khmer to users, according to the instructions of the Ministry of Agriculture, Forestry and Fisheries.	Chemical fertilizers have not listed
	Article 18 (Sub-Degree 69 On Starndard and Management of Agricultural Materials): Every material for wrapping up pesticidess which will be in imported, stocked, sold wholesale and retail shall be labeled in Khmer for easy comprehension. The form and character of label shall be determined by the Ministry of Agriculture, Forestry and Fisheries.	List of pesticides permitted for use in Table 2-5, Chater II
Inventory	Article 12 (Law on Environmental Protection and Natural Resources Management): The Ministry of Environment shall co-operate with the relevant ministries to draw up an inventory specifying: • The source, type and amount of the polluted substance and waste imported, created, transported, recreated, processed, maintained, disposed or dispelled into the sky, water, land or on the land. • The source, type and amount of the polluted substance and dangerous substance imported, produced, transported, maintained, used, created, processed, reprocessed, disposed, or dispelled into the sky, water, land or on the land, • The source, type and size of any disturbance caused by sound and vibration.	Toxic substances, toxic waste and hazardous substances has not in nomenclature or the kinds lists

Procedure	Legal instrument and description	Chemical/category
Prohibition	Article 17 (Law-Degree No 33 on Fishery Management): All kinds of fishing in fresh water territory by the use of the fishing instrument as followings shall be strictly prohibited: A/. Electrical touch, gunpowder, explosives or any kind of poisonous substance. B/. Instrument for pumping or to throw out the water and expends any part of fishing zone. C/. Fish shelter of by any mean which makes fish crowded. D/. Harpoon. Trident or Fish-gig including fished magnifying glass. E/. Fish-net or any kind of large fishing net with its hole size is small that 1.5 cm. F/. Throw fishing net standing fish net or any kind of boat net. G/. Any kind of fishing instrument which is pushed or pulled by Machine Power. H/. Any kind of woven sheet of bamboo which is smaller than 1.5cm between one to other one. I/. All kind of strings or by any other means which cause frightened. J/. Any dam including with other fishing instruments. K/. The modern instrument or new fishing method which is limited as provided in the proclamation of Ministry of Agriculture, Forestry and Fisheries.	Any kind of poisonous substance has not listed yet
	Article 21 (Sub-Degree No 37, on Solid Waste Management): The importation of the hazardous waste from abroad into the Kingdom of Cambodia is strictly prohibited.	List of hazardous waste completely based on annex of Basel Convention
	Article 6 (Sub-Degree No 27, on Water Pollution Control): The discharge of waste water from any SOURCE of pollution that is not consistent with the standards for effluent discharge as mentioned in the article 4 and article 5 of this sub-decree shall be strictly prohibited.	
	Article 8 (Sub-Degree No 27, on Water Pollution Control): The disposal of solid waste or any garbage or hazardous substances into public water areas or into public drainage system shall be strictly prohibited. The storage or disposal of solid waste or any garbage and hazardous substances that lead to the pollution of water of the public water areas shall be strictly prohibited.	
	Article 8 (Sub Degree No 42 on Air and Noise Pollution Control): The emission of pollutants into the atmosphere exceeds the standard which stipulated in annex 3 and annex 4 of this sub decree be strictly prohibited.	
	Article 10 (Sub Degree No 42 on Air and Noise Pollution Control): The importation and production of flammable substances containing S, Pb, C_6H_6 and Hydrocarbon shall be compiled with the standard which stipulated in annex 8 of this sub decree.	S, Pb, C_6H_6 and Hydrocarbon
Penalty	Article 64 (Constituion of the Kingdom of Cambodia): The State shall ban and severely punishes those who impact, manufacture, sell illicit drugs, counterfeit and expired goods which affect the health and life of the consumer.	Narcotic drugs but has no listed
	Article 12 (Law On Pharmaceuticals Management): Shall be penalized and fined from 20,000,000 Riles (twenty million) to 50,000,000 Riles (fifty million) or subjected to penalty with 5-10 years in prison or to both penalties the person who deliberately makes production, import-export business of medicines containing addictive matters without authorization, counterfeited medicines, ineffective medicines, expiring medicines which affect the user's health and life.	Pharmaceutical products

Procedure	Legal instrument and description	Chemical/category
	Article 35: (Sub-Degree 69 On Starndard and Management of Agricultural Materials):Shall be administratively penalized as follows: 1. In writing warning the natural or legal persons having done business of agricultural materials not registered as set out in article 4 11,12, and 31, and seizing the illegal object temporarily, them preparing the file and sending it to Court, 2. In writing warning the natural or legal persons having done business of agricultural materials without letter of authorization from Ministry of Agriculture, Forestry and Fisheries as set out in articles 5, 13, and 21. Temporarily-confiscating the illegal objects, then preparing the file and sending it to Court in case of recidivism. 3. In writing warning the natural or legal persons having done business of falsified agricultural materials with poor qualities different from those registered and set forth in article 6, 9, 22, 29, 32 and 34, and then preparing the file and sending it to Court. In case of reoffending, definitively taking back the letter of authorization to do business. 4. In writing warning the natural or legal persons having done business of agricultural materials in showing disrespect to wrapping up standard as set forth in article8, 19, 20, 29 and 33 and forcing them to enter in contract of correction with in 15 days. Temporarily withdrawing the letter of authorization to do business in case of second offense. 5. In writing warning the natural or legal persons having done business of pesticides without ensuring the safety of their stocking, the disposing of residues or wrapping material, or having advertised pesticides without authorization from Ministry of Agriculture, Forestry and Fisheries as set forth in articles 23, 24 and 25, and forcing them to enter into contract of correction within 7 days. Temporarily withdrawing the letter of authorization to do business in case of second breach. 6. In writing warning the natural or legal persons having imported or produce seeds with certificate or divided plant seeds without authorization or registration with Ministry of Agriculture, Forestry and Fisheries as set forth in articles 27 and 28, and compelling them to enter into contract of correction within 7 days. The administrative penalization according to the above determination is the competence of Ministry of Agriculture, Forestry and Fisheries.	Agricultural Materials

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

The legal instruments in Table 4-1 are in response to various stages of the chemical life cycle including production, import, storage, transport, distribution, use, and disposal. The overview of legal instruments to manage chemicals by use category is presented in Table 4.3 below:

Table 4-3: 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, consumer use)	▮	▮	▮	▮	▮	▮	▮
Fertilizers	▮	▮	▮	▮	▮	▮	▮
Industrial Chemicals (used processing facilities)	▮	▮	▮			▮	▮
Petroleum Products	▮		▮	▮			
Consumer Chemicals	▮	▮					
Chemical Wastes	▮	▮	▮	▮	▮	▮	▮

4.4 SUMMARY DESCRIPTION OF KEY APPROACHES AND PROCEDURES FOR MANAGING CHEMICALS

The procedures for managing chemicals are divided into four main sections: procedure of importation of chemicals, procedure of exploitation of chemical fertilizers and pesticides, procedure of prohibition of chemicals use, and procedure of severely restricted for use. These procedures are determined by laws/declarations to ensure effective management of chemicals without negative impact on public health and the environment. Descriptions of each procedure are as follows:

4.4.1 Procedure of Chemicals Importation (Declaration of Import as for Quality and Safety Issues)

The import of chemicals (including the management of products addressed under other technical provisions) shall generally comply with customs procedures, but ought to be monitored for their conformity related to quality and safety of the products by a specific institution, (currently) the CAMCONTROL Department of the Ministry of Commerce. This additional control by this institution complies to the following procedure:

4.4.1.1 Controlling the Import Application (Document verification):

This procedure aims to control the import application form that importers have to submit to the competent authority for cross border permission. The import application form for cross border permission and related documents must be submitted to the competent authority at least one week in advance before goods arrive at the border. The documents to be submitted to the competent authority consist of:

- Certificate of quality specification issued by the competent authority of the exporting country;
- Export license;
- Import permit from relevant government agencies regulated products;
- Chemical safety card of the imported substances;
- Bill of lading;
- Invoice;
- Packing list; and

- Declaration on the intended uses in Cambodia.

After receiving the import application form, the competent authority will control all importation documents; investigate the import company's background, and verify the chemical substances and products comply with national and international technical regulations and standards.

4.4.1.2 Controlling Products at Border Checkpoint

When the import license is granted, the companies or transportation service agencies take the documents related to the imported goods and actual goods for the competent authority at the border to control goods. The controlling of the goods, before receiving a permit to import, aims to conduct basic examination including existing documents and chemical law and regulation requirements, and control on product labels, formulation packaging, physical characteristics of substances packaged.

In some cases, the importation of goods has temporary entry permission with conditions as follows:

- Compare and verify the chemical quality and safety products with documentary claimed by importers and national and international regulations through quality and safety samples analysis after temporarily authorized to import and stock.
- Analysis of the chemical quality and safety products samples can be conducted in both internal and external laboratories as possible.
- Return to imported source origin in cases where the chemical substances and safety products contained are of unacceptable quality or are unsafe products as illustrated by laboratory analysis results with respect to national and international regulation requirements.
- Provide legal import authorization to importers in cases where the chemical substances and safety products are appropriate with national and international regulatory requirements and acceptable quality and safety products are to be illustrated by laboratory analysis results.

4.4.2 Procedure for Fertilizers and Pesticide Exploitation

The main objectives of this procedure are to promote the legal compliance related to pesticides and chemical fertilizers exploitation and trade and the improvement of fertilizers and pesticides management in Cambodia for both the improvement of people's health and economic considerations. The Ministry of Agriculture, Forestry and Fisheries is the authority responsible for implementation of procedures in pesticides and chemical fertilizers exploitation and trade. The Ministry of Environment is responsible for collaboration with the Ministry of Agriculture, Forestry and Fisheries in managing the disposal of chemical fertilizers and pesticides in terms of safety for the environment.

In order to receive the right to import chemical fertilizers and pesticides, the importers are required to submit the application to the competent authority for registration. Natural or legal persons who are or want to be in the business of pesticides shall be registered and authorized by the Ministry of Agriculture, Forestry and Fisheries. Pesticides not registered or not permitted for temporary use by the Ministry of Agriculture, Forestry and Fisheries will be prohibited from import, production, formulation, packaging, wholesale, etc.

4.4.2.1 Registration

There are 5 kinds of registration for pesticidess:

Temporary Registration	This registration shall be made for all categories of pesticidess mentioned in the notice of authorization to temporarily use by the Ministry of Agriculture, Forestry, and Fisheries and being circulated for sale in market places.
Registration with Conditions	This registration shall be made for any pesticidess for which the initial registration is requested but the data or other necessary conditions shall be additionally provided according to the technical requirements of the Ministry of Agriculture, Forestry and Fisheries.
Full Registration	This registration shall be made for any pesticidess for which the registration applicant has fulfilled every technical requirement of the Ministry of Agriculture, Forestry and Fisheries. Registration number and certificate shall be issued by the Ministry of

Agriculture, Forestry and Fisheries.

Authorization to Use for Experimentation	This authorization to import pesticidess which have not yet been authorized to use, with the purpose to carry out research only. Temporary registration and registration with conditions will be transferred to the full registration one year later, if the registration applicant fulfills all technical requirements of the Ministry of Agriculture, Forestry and Fisheries.

The one-year period can be extended in cases of reasonable cause. The registration validity is 3 years in cases where there is no withdrawal or cancellation. The new authorization with the same period can be received after paying the registration and providing additional data. For the failure to ask for new registration, the validity will be automatically cancelled.

4.4.2.2 Permitted Using:

- Every material for wrapping up pesticidess to be imported, stocked, sold wholesale and retail shall be labeled in Khmer for easy comprehension.
- The form and character of label shall be determined by the Ministry of Agriculture, Forestry and Fisheries. Every material for wrapping up pesticidess shall correspond to the standard fixed by Ministry of Agriculture, Forestry, and Fisheries.
- The manner and conditions to keep pesticidess shall be determined by Ministry of Agriculture, Forestry and Fisheries. The installation of warehouse for keeping pesticidess shall be authorized by the Ministry of Agriculture, Forestry, and Fisheries with approval from Ministry of Environment.
- The disposal and destruction of remnants or materials for wrapping up pesticides of businessmen shall be authorized by Ministry of Agriculture, Forestry, and Fisheries with approval from Ministry of Environment.
- All advertisements on pesticides through any means shall be authorized by Ministry of Agriculture, Forestry, and Fisheries. Can be authorized only for pesticides that have already been fully registered.

4.4.3 List of Pesticides Banned for Use in Cambodia

In order to protect public health and environmental quality by avoiding the danger of highly toxic pesticides according to WHO and FAO guidelines on classification of pesticides hazards, the Government of Cambodia has banned 116 chemical substances included 9 POPs pesticides as shown in Table 4.4 below:

Table 4-4: List of Pesticides Banned For Use in Cambodia

No	Common name	Use	Toxicity (by WHO)	Family	POP
01	1,1,2,2-Tetrachloroethane	FM		Org	
02	2,4,5-T	H	O	OC	
03	2,4,5-TP (Fenoprop)	H	O	OC	
04	Aldicarb	I	Ia	CA	
05	Aldoxycarb (Aldicarb sulfone)	I	O		
06	Aldrin	I	O	OC	(POP)
07	Aminocarb	I	O	Org	
08	Amitraz	I	O	Triazapentadiene	
09	Antu	R	O	CA	
10	Aramite	I	O	OC	
11	Arsenic compound (AS)	F		AS	
12	BHC / HCH, Lindane	I	II	OC	

No	Common name	Use	Toxicity (by WHO)	Family	POP
13	Binapacryl	I,F	O	Org	
14	Bis (Tributyltin) oxide		O		
15	Bromophos	I	O		
16	Bromophos ethyl	I	O		
17	Cadmium Compound (Cd)	F		Inorg	
18	Calcium arsenate	I	Ib	AS	
19	Calcium cyanide	FM	Ib	Inorg	
20	Camphechlor (Toxaphene, Polychlorcamphene)	I	O	OC	(POP)
21	Captafol	F	Ia	OC	
22	Captan	F	Un	PD	
23	Carbophenothion	I	O		
24	Chlordane	I	II	OC	(POP)
25	Chlordecone	I	O	OC	
26	Chlordimeform	I	O	Formami-dine	
27	Chlorfen vinphos / CVP	I	Ib	OP	
28	Chlormephos	I	Ia	OP	
29	Chlorthiophos	I	O	OP	
30	Coumaphos	AC	Ia	OP	
31	Crimidine	R	O		
32	Crotoxyphos	I	O		
33	Cytokinin (Zeatin)	PGR		Antibiotic	
34	Cyanthoate / Tartan	I	O	OP	
35	Cyeloheximide	PGR	O	Org	
36	Cyhexatin	I	III	OT	
37	Daminozide	H	Un	Org	
38	DBCP(Dibromochloropropane)	FM	O	OC	
39	DDT	I	II	OC	(POP)
40	Demephion	I	O	OP	
41	Demeton	I	O	OP	
42	Demeton-S-methyl	I	Ib	OP	
43	Diamidafos	N	O		
44	Dieldrin	I	O	OC	(POP)
45	Demefox	I	O		
46	Dimetilan	I	O		
47	Dinose /Dinosebacetate,Amine	H	O	Dinitroph-enol	
48	Dinoterb	H	Ib	NP	
49	Dioxathion	I	O	OP	
50	Disulfoton / Ethylthiodemeton	I	Ia	OP	
51	DNOC	I	Ib	NP	

No	Common name	Use	Toxicity (by WHO)	Family	POP
52	Edifenphos	F	Ib	OP	
53	Eldrin /Endrin/ Nendrin	I	O	OC	(POP)
54	Endosultan	I	II	OC	
55	Endothion	I	O		
56	EPN	I	Ia	OP	
57	Ethoprop / Ethoprophos	I	Ia	OP	
58	Ethylene dibromide	FM		Org	
59	Ethylene dichloride	FM		Org	
60	Ethylene Oxide	FM		Org	
61	Fenamiphos	N	Ia	OP	
62	Fensulfothion	I	O	OP	
63	Fentin (fenbutatin oxide)	I	Un	OT	
64	Fluoro acetamide	R	Ib	Org	
65	Fonofos	I	Ia	OP	
66	Fosthietan	N	O	OP	
67	Heptachlor	I	II	OC	(POP)
68	Hexachlorobenzene	F	Ia	OC	(POP)
69	IPSP	I	O		
70	Isobenzan	I	O	OC	
71	Isodrin (Isomer of Aldrin)	I	O		
72	Isoxathion	I	Ib	OP	
73	Lead arsenate	I	Ib	AS	
74	Lead Compound (Pb)			Inorg	
75	Leptophos	I	O	OP	
76	MCPB	H	III	OC	
77	Medinoterb acetate	H	O		
78	Mephospholan	I	O	OP	
79	Memaptophos	I	O	OP	
80	Mercury Compound (Hg)	F			
81	Methacarbate		O		
82	Methamidophos	I	Ib	OP	
83	Methidation	I	Ib	OP	
84	Methomyl	I	Ib	CA	
85	Mevinphos	I	Ia	OP	
86	Mirex	I	O	OC	(POP)
87	Monocrotophos	I	Ib	OP	
88	Nitrilacarb		O		
89	Nitrofen	H	O	Nitrophenols	
90	Oxamyl	I	Ib	CA	

No	Common name	Use	Toxicity (by WHO)	Family	POP
91	Oxydeprofos (ESP)	I	O		
92	Paraquat	H	II	BP	
93	Parathion (Parathion-ethyl)	I	Ia	OP	
94	Parathion-methyl	I	Ia	OP	
95	Pentachlorophenate de sodium	F	Ib	OC	
96	Pentachlorophenol / PCP	I, F, H	Ib	OC	
97	Phenothiol	H	III	OC	
98	Phorate	I	Ia	OP	
99	Phosfolan	I	O	OP	
100	Phoshamidon	I	Ia	OP	
101	Prothoate	I	O	OP	
102	Schradan	I	O	OP	
103	Scilliroside / red squill	R	O	Org	
104	Selenium Compound (Se)	F			
105	Sodium chlorate	H	III	OC	
106	Sodium Compound	F			
107	Sodium fluoroacetate	R	Ia	Org	
108	Strobane (Terpene polychlorinated)	I			
109	Sulfotep	I	Ia	OP	
110	Talinum compound	R	O	Inorg	
111	TEPP	I	O	OP	
112	Terbufos	I	Ia	OP	
113	Thionazin	I	O	OP	
114	Triamiphos	I, F, AC	O		
115	Triazophos	I	Ib	OP	
116	Trichloronate	I	O	OP	

Source: Appendix 1 of the Declaration No 598 on List of the Agricultural Pesticides in the Kingdom of Cambodis dated December 15, 2003, Ministry of Agriculture, Forestry and Fisheries

AB Alkyl Bromide
AC Acaricide
AS Arsenic Compound
BC Benzamide Compound
BP Botane pesticide or Bipyridylium Derivative
CA Carbamate
CO Coumarin derivative or Coumarin Anticoagulant
CU Copper compound
DC Dithiocarbamates
F Fungicide
FM Fumigant
H Herbicide
I Insecticide
IC Inorganochlorine Compound
Inorg Inorganic Compound
IP Inorganic Phosphide
L Larvicide
N Nematicide
NP Nitrophenol derivate
O Obsolete
OC Organochlorine Compound
ORG Organic Compound
OP Organophosphorus Compound
OT Organotin Compound
PAA Phenoxyacetic Acid derivative
PD Phtgalimide Derivative
PGR Plant Growth Regulation
PY Pyrathroid
R Rodenticide
SU Substituted Urea
TC Thiadiazin Compound or Thiocarbamate
TD Triazin derivative
TU Thiourea Compound
Un Unlikely to present acute hazard in normal use

4.4.4 Chemicals Substance Severely Restricted for Use

To combat narcotic drugs production, the Royal Government of Cambodia restricts certain chemical substances that could be used as raw material for drug production. The Ministry of Industry, Mines and Energy Declaration No 110, dated February 11, 2004, on management and control of industial chemical substanes for import-export and distribution specifically lists chemical substances that could be used as raw materials for drug production. Any importation of those chemicals, as listed in Table 4-5, must be authorized by the Ministry of Industry, Mines and Energy.

Table 4-5: List of Chemical Substences as Raw Material for Drug Production Severely Restricted For Use in Cambodia

No	Common Name of Chemical	No	Common Name of Chemical
1	1-phenyl-2-propanone	19	Methylene Chloride
2	3,4-methilenedioxy-pgenyl-2-propanone	20	N-acetylanthranilic Acid
3	Acetic Acid (Glacial)	21	Palladium
4	Acetic Anhydride	22	Phenylacetic Acid
5	Acetone	23	Phosphorus Pentachloride
6	Acetyl Chloride	24	Phosphorus Trichloride
7	Anthranilic Acid	25	Piperidine
8	Barium Sulphate	26	Piperonal
9	Caustic Soda	27	Potassium Permanganate
10	Chloroform	28	Safrole
11	Ethyl Acetate	29	Soda Ash
12	Ethyl Ether	30	Solvents
13	Ethylidence Diacetate	31	Sulfuric Acid
14	Formic Acid	32	Thinner
15	Hydrochloric Acid	33	Thionyl Chloride
16	Isosafrole	34	Toluene
17	Lysergic Acid	35	Xylene
18	Methyl Ethyl Kethone		

Source: The Declaration on Management and Control of Industial Chemical Substanes Import Export and Distribution, Feb 12, 2004, Ministry of Indurstry, Mines and Energy.

4.5 NON-REGULATORY MECHANISMS FOR MANAGING CHEMICALS

Non-regulatory mechanisms are focusing on the voluntary actions of private sectors. This kind of mechanism (for example, industrial associations, emergency teams, tourism exploitation associations, etc.) is very popular among developed countries, playing a very important role in contributimg to the management of chemicals with the governmental institutions. It has specific objectives in managing certain kinds of chemicals or groups of chemicals and determines the specific scope of work for their implementation.

Cambodia has not yet established non-regulatory mechanisms for managing chemicals. But Cambodia has numerous private sector groups that have participated with governmental institutions through voluntary actions in public awareness raising, environmental protection through contributions of endowment funds, and in various relevant chemicals management campaigns.

4.6 COMMENTS / ANALYSIS

- Cambodian chemicals management laws and regulations have big gaps, and the existing legal instruments also have gaps, in both general chemicals management aspects and management of specific chemicals group. The existing legal instruments do not adequately account for chemicals management during each stage of a specific chemical's life cycle. Most of the legal instruments have only general provisions and do not clearly define the role and responsibility of the governmental institutions and stakeholders.
- Existing chemicals law enforcement is limited. The wider question of chemicals management is also largely limited in both technical and management aspects which encompass laws and regulations. Paralleled with above issues, Cambodia also lacks human resources and monitoring facilities, which causes ineffective law enforcement.
- The existing legal instruments have not completely responded to the priority concerns of chemical related issues described in Chapter III of this national profile. The main issues are not covered by existing legal instruments; these are: chemicals for consumer use, safety measures in chemicals loading and unloading, transportation of chemicals, distribution/marketing, use/handling, and disposal and toxicity levels permitted in food products.
- Cambodia has developed several legal instruments in order to promote the implementation of the international conventions and protocols of which Cambodia is a member or is preparing to become a member in the future. These legal instruments under consideration include:

    - Law on Management of Industrial Factories;
    - Law on Hazardous Waste Management (Basel Convention);
    - Law on Pesticides Management;
    - Law on Standards of The Kingdom of Cambodia; and
    - Sub-Decree on Management of Substances Depleting Ozone Layers (Vienna Convention).

CHAPTER 5
GOVERNMENTAL INSTITUTIONS INVOLVE IN THE MANAGEMENT OF CHEMICALS

This chapter describes and analyzes the mandates and programmes of different ministries, agencies, and other governmental institutions responsible for, and concerned with, various aspects of chemicals management. Chemicals management needs the participation of the various governmental institutions based on roles and responsibilities determined by the Royal Government of Cambodia.

5.1 GOVERNMENTAL MINISTRIES

Governmental institutions participate in chemicals management according to their role and responsibility regulated by governmental ordinances. The governmental institutions fulfill their mandates in managing chemicals by building safety into the chemicals production processes, chemicals trade, and by ensuring the prevention and/or mitigation of impacts on people's health, especially user health, and protect the environment and biodiversity.

The governmental ministries involved in chemical management process include:

1. Ministry of Agriculture Forestry and Fisheries
2. Ministry of Commerce (Department of CAMCONTROL)
3. Ministry of Economic and Finance (Department of Customs)
4. Ministry of Environment
5. Ministry of Industry Mines and Energy
6. Ministry of Health
7. Ministry of Interior (National Authority for Controlling Drugs)

Ministry roles and responsibilies in managing chemicals (over the stages of chemical's life cycle) are illustrated in Table 5-1 below.

Table 5-1: Responsibilities of Government Institutions in Stages of Chemicals Life-Cycle

Governmental Institutions	Stages of Chemicals Life-Cycle							
	Importation	Production	Storage	Transport	Distribution/ Marketing	Use/Handling	Emergencies	Disposal
Ministry of Agriculture Forestry and Fisheries	x	x	x	x	x	x	x	x
Ministry of Commerce	x				x			
Ministry of Economic and Finance	x							
Ministry of Environment	x	x	x	x	x	x	x	x
Ministry of Industry Mine and Energy	x	x	x			x	x	x
Ministry of Health	x	x	x	x	x	x	x	x
Ministry of Interior (National Authority for Controlling Drug)	x	x	x	x	x	x	x	x

5.2 DESCRIPTION OF MINISTERIAL AUTHORITIES AND MANDATES

The various governmental institutions described above have difference roles and responsibilities for managing chemicals determined by the Royal Government of Cambodia. Summary role and responsibilities of those governmental institutions are as follows:

5.2.1 Ministry of Agriculture forestry and Fisheries

Related to chemicals management, the Ministry of Agriculture, Forestry, and Fisheries has large responsibilities for the management of agricultural materials including the three main sectors of chemical fertilizers, pesticides, and veterinary drugs through controlling import and use. The Ministry has obligations to develop agricultural materials, management policy and legal frameworks, and promote public awareness in the safe use of agricultural materials in order to improve agricultural productivity, food safety, food security, and public welfare.

5.2.2 Ministry of Commerce (CAMCONTROL)

Related to chemicals management, the Ministry of Commerce through the department of CAMCONTROL has the role and responsibility in controlling the quality and quantity of imported and exported goods and carrying out the repression of fraud related to product quality except for pharmaceutical products, medical equipment, and cosmetics.

5.2.3 Ministry of Economic and Finance (Department of Custom)

Related to the role and responsibility of the Ministry of Economic and Finance in managing chemicals, the Department of Customs is the Ministry's agent in managing import-export regulated goods; to carry out prevention measures and confiscation of goods smuggled; control, monitor, and manage import-export regulated goods; address passenger's goods, foreign currency, valuable jem stones, jewels, cultural heritage, packages, and parcel postage in all kinds of transportation means.

5.2.4 Ministry of Environment

The Ministry of Environment cooperates with other governmental institutions, national and international organizations, non-governmental organizations, and private sectors. It is responsible for monitoring environmental quality (water, soil, and air), controlling environmental pollutants release, and participates in collecting, compiling, and managing data related to toxic and hazardous chemicals, and managing all kinds of waste in terms of a safe environment.

5.2.5 Ministry of Industry Mines and Energy

The Ministry of Industry, Mines and Energy is responsible for promoting development of industrial activities, and industrial chemicals production and use in terms of national industrial chemicals management. This Ministry also plays the important role to promote mineral exploration and exploitation activities, and hydropower development. Most importantly, the Ministry has the obligation to create the development of legislation, policy, and planning related to industrial aspects including industrial chemical management.

5.2.6 Ministry of Health

Related to chemicals management, the Ministry of Health is responsible for developing overall health policy direction, regulation and legislation based on the governmental policy goals to improve health, managing the systems of pharmaceutical production, business and distribution of medical and paramedical equipment to all private and public units, and examining and following-up of food safety.

5.2.7 Ministry of Interior (National Authority for Drugs Control)

Relative to the Ministry of Interior in managing chemicals, the Secretariat of National Authority for Drugs Control is responsible for gathering information and operational action against the cultivation of narcotic plants, their production, use, and distribution and the trade/trafficking of drugs. It facilitates drugs control activities in cooperation with other agencies in order to ensure effective and safe drugs control.

5.3 GOVERNMENTAL PROGRAMS FOR MANAGING CHEMICALS

The Royal Government of Cambodia has recognized that chemicals-related activities such as transportation, stocking, packaging, distribution, and use has caused negative impacts on health and the environment. In order to mitigate the negative impact, the governmental institutions have been developing and implementing some programs for each institution responsible for chemicals management. The following are governmental programmes for managing chemicals.

Table 5-2: Governmental Programmes for Managing Chemicals

Governmental Institutions	Programmes	Contact Address
Ministry of Agriculture Forestry and Fisheries	1. Agriculture Productivity Improvement Project (APIP) • Plant Protection (Sub-Component)	• Plant Protection Office, Department of Agronomy and Agricultural Land Improvement, MAFF #10, Minireth Street, Chamcar Morn District, Phnom Penh Cambodia Tel: (855) 23 211 351 / 12 898 049 Email:simonabuntoun@hotmail.com
	2. Agriculture Productivity Improvement Project (APIP) • IPM (Sub- Component)	• IPM Sub-Component, Department of Agronomy and Agricultural Land Improvement, MAFF #14, Minireth Street, Chamcar Morn District, Phnom Penh Cambodia Tel: (855) 23 211 315 / 12 826 199 Email:apipipm@online.com.kh
	3. Agricultural Material Standards	• BAMS Office, Department of Agricultural Legislation, MAFF #200, Preah Norodom Blvd, Sangkat Tonle Bassac,Khan Chamcar Morn District, Phnom Penh Cambodia Tel: (855) 23 211 315 / 12 841 867
Ministry of Commerce	1. Establishing Inspection Programme and Strengthening Implementation at the Entry Points and Market Surveillance Including the Focus on Chemicals	• Department of CAMCONTROL, Ministry of Commerce #50Eo, Street 144, Phnom Penh, Cambodia Fax/Phone: (855) 23 426 166 Email: camcontrol@camnet.com.kh
Ministry of Economy and Finance	1. Import-Export Goods Control and Taxes Collection	• Customs and Excise Office, Ministry of Economy and Finance #113, Street 146,Psar Depot II, Toul Kok, Phnom Penh, Cambodia Phone: (855) 12 811 118 Fax: (855) 12 841 100 Email: 012811118l@mobitel.com.kh
Ministry of Environment	1. National Waste Management Program (Solid and Liquid Waste)	• Department of Pollution Control, Ministry of Environment #48, Samdech Preah Sihanouk, Tonle Bassac,Khan Chamcar Morn, Phnom Penh Cambodia Tel: (855) 23 210 492 / 12 926 108 Email: moepcd@online.com.kh Heng.nareth@online.com.kh
	2. National Ozone Program	• National Ozone Unit, Department of Pollution Control, Ministry of Environment #48, Samdech Preah Sihanouk, Tonle Bassac, Khan Chamcar Morn, Phnom Penh Cambodia Tel: (855) 23 210 492 / 12 962 103 Email: moepcd@online.com.kh sokharavuth@online.com.kh

Governmental Institutions	Programmes	Contact Address
	3. National Hazardous Waste Management Program	• Basel Convention Unit, Department of Pollution Control, Ministry of Environment #48, Samdech Preah Sihanouk, Tonle Bassac, Khan Chamcar Morn, Phnom Penh Cambodia Tel: (855) 23 210 492 / 12 856 818 Email: moepcd@online.com.kh choviran@hotmail.com
	4. National Persistent Organic Pollutants Substance	• Stockholm Convention Unit, Department of Pollution Control, Ministry of Environment #48, Samdech Preah Sihanouk, Tonle Bassac, Khan Chamcar Morn, Phnom Penh Cambodia Tel: (855)) 23 210 492 / 12 915 792 Email: moepcd@online.com.kh nip_pops@online.com.kh
Ministry of Industry, Mines and Energy	1. Draft Chemical Guideline (Techniques and Conditions in Management Tool) • Establishing a group risk management system; • Establishing standards for hazardous substances; and • Establishing method of evaluating environmental friendliness.	• Industrial Environment Office, Department of Industrial Techniques (DIT), MIME #45, Norodom Blvd, Phnom Penh, Cambodia Tel/Fax: (855) 23 211 141
	2. Clean Industrial Production (CIP) Project. (SECO/SWISS/UNIDO)	• Department of Industrial Techniques, MIME #45, Norodom Blvd, Phnom Penh, Cambodia, Tel/Fax: (855) 23 428 263
	3. Small and Medium Enterprises (SME) Project	• Department of Small Industry and Handicraft, MIME #45, Norodom Blvd, Phnom Penh, Cambodia Tel/Fax: (855) 23 428 263
	4. Cambodia Provincial and Terrain-Urban Water Supply and Sanitation	• Department of Potable Water Supply, MIME, #45, Norodom Blvd, Phnom Penh, Cambodia
	5. Industrial Standards Project	• Department of Industrial Standards, MIME #45, Norodom Blvd, Phnom Penh, Cambodia Tel/Fax: (855) 23 216 086
Ministry of Health	1. Medical Management Program	• Department of Drug and Food, MoH #08, Ung PouKun Blvd, Sangkat Mitapeap, Khan 7 Makara, Phnom Penh, Cambodia Tel/Fax: (855) 23 880 248 E-mail: moh-cpn@forum.org.kh
	2. Hospital Waste Management Program	• Hospital Service Bureau, Hospital Department, Ministry of Health (MoH) #151-153, Kampuchea Krom, Sangkat Mitapeap, Khan 7 Makara, Phnom Penh, Cambodia Tel: (855) 12 912 122
	3. Obsolete Medical Management Program	• Department of Drugs and Food, MoH #08, Ung PouKun Blvd Sangkat Mitapeap, Khan 7 Makara, Phnom Penh, Cambodia Tel/Fax: (855) 23 880 248 E-mail: moh-cpn@forum.org.kh

5.4 COMMENTS/ANALYSIS

The governmental institutions' roles and responsibility as described above shows that there is little overlapping of responsibilities and obligations in managing chemicals. However, each of the governmental institutions has limited effective implementation of their responsibilities in managing chemicals due to a lack of human resources and inadequate equipment for the further effective operation. The low income of general governmental officers, which results in a low standard of living, has become a critical reason why the governmental institutions can not reach effective chemicals management.

CHAPTER 6
RELEVANT ACTIVITIES OF INDUSTRY, PUBLIC INTEREST GROUPS AND THE RESEARCH SECTOR

This chapter describes and reviews activities of non-governmental bodies and entities which support national efforts to manage chemicals that aim to improve the sectors environmental performance and safe use and disposal of such chemicals as well as protect people's health and the environment related to effects caused by the current chemicals use in Cambodia.

6.1 PUBLIC INTEREST GROUPS PROGRAMS FOR MANAGING CHEMICALS

The participation of community, private organizations, and other agencies is the basic need for effective implementation of laws, regulations, and management policy. However, at the present this participation is focused on community waste management only. The lack of complete participation of those sectors is not because there are no chemicals risks in Cambodia. Due to the increasingly high volume of misused and wrongly-used chemicals, Cambodian people need to be aware of chemical hazards and risks and raise more concerns about the proper use of hazardous chemicals.

In general, participatory chemicals management between the public, community, and other agencies is insufficient due to the lack of coordination mechanisms, human resources, and financial resources for promoting such participation.

6.1.1 Private Organizations Programs for Managing Chemicals

In order to implement the national policy and/or programs in chemicals management, there needs to be voluntary programs of action through the raising of public awareness regarding environmental issues (e.g. national and international environmental day, national environmental clean-up day, world water resource day, national ozone day, etc.) and waste management issues. However, the permanency of voluntary programs related to chemicals management is not yet established.

Two private companies have been operating businesses collecting and managing urban waste, hazardous waste, and industrial/factory waste.

Table 6-1: Private Organizations Program for Chemicals Management

Public Interest Groups	Programmes	Contact Address
Cintri Company	Phnom Penh Municipal Solid Waste Collection and Transportation Service	#442D, Monivong Blvd, Sangkat Tonle Bassac, Khan Chamkarmon, Phnom Penh Tel: (855) 12 994 995
Sarom Trading Company	Industrial Waste Collection, Transportation and Landfill Facility	**SAROM TRADING CO., LTD.** #122, Str 430, Sangkat Toul Tompong II Khan Chamcarmon, Phnom Penh Tel: (855) 11 938 967 Email: saromtrading@hotmail.com

6.1.2 Non-Governmental Organizations Programs for Managing Chemicals

In order to achieve a chemicals management plan, the Royal Government of Cambodia has provided opportunities and facilitated for participation for non-governmental organizations through the support of their chemicals management activities. In fact, NGOs' participation activities are a basis for the achievement of an effective implementation of a chemicals management plan developed by the government. Non-governmental organization programs for managing chemicals in Cambodia are shown in the following table:

Table 6-2: NGOs Program for Chemical Managements

Name of NGOs	Programmes	Contact Address
NGO Forum on Cambodia	Pesticides Reduce Network-Cambodia (PRN-C): this program focuses on promoting awareness of pesticides issues and problems, reducing pesticides use and promoting safety agricultural practices	#9-11, Str 476, Toul Tompong I,Khan Chamkar Morn, Phnom Penh Fax/Phone: (855) 23 214 429 E-mail: ngoforum@ngoforum.org.kh
Centre d'Etude et de Developpement Agricole Cambodgien (CEDAC)	Pesticides Reduce Along Mekong River in Cambodia: this program comprises research action, agricultural development, education, publishing, general development services, and join PRN-C.	#39, Str 528, Sangkat Boeung Kak I,, Khan Toul Kok, Phnom Penh P.O.Box: 1118 Fax/Phone: (855) 23 880 916 E-mail: cedac@camnet.com.kh
Cambodia-Australia Agricultural Extension Project	Support Program For Farming System, Agro-Ecosystem And Commune Analysis Improve Monitoring And Evaluation System Support Program For Human Resource Development Through Training	#200, Norodom, Khan Chamkar Mon Phnom Penh, Tel: (855) 12 903 088 Fax: (855) 23 213 011 Email:caaep@online.com.kh Email: tos@bigpond.com.kh
Sre Khmer Organization	Support Program For Cambodia Farmers' Organic Vegetable Production	#11B, Str 101, Sangkat Boeung Trabek, Khan Chamkarmon, Phnom Penh Fax/Phone: (855) 23 210 217
Resource Development International (RDI)	Survey and Research on Arsenic Substance in Well Water at Kandal Province	Street Lo-ith-royal, KeanSvay district, Kandal Province Tel/Fax:(855) 23 369 577 Email: rdi.bus@.rdic.org
CSARO	Community Sanitation and Recycling Program	#71, Street 368/163, Sangkat Toul Svay Prey 1 Khan Chakarmon, Phnom Penh, Cambodia, P.O Box 2015 Tel/Fax: (855) 23 211 116 Mobile: (855) 12 957 255 E-mail: csaro@online.com.kh Visit: www.online.com.kh/users/csaro
Cambodian Education and Waste Management Organization	Composting fertilizer program	Sangkat Choerng Ek, Khan Dang kor, Phnom Penh P.O.Box: 955 Phone: (855) 12 842 387 Email: comped@forum.org.kh

6.1.3 Summary of Expertise Available Outside of Government

Outside of governmental capacity, Cambodia has expertise from different sources such as educational institutes, industry, the private sector, unions, professional organizations, etc. to support national programs and implement national policy regarding chemicals management. However, those services can achieve a limited scope of actions relative to their resources, capacity, and ability. The necessary tasks and services for expertise available outside of government are summarized in the table below:

Table 6-3: Summary of Expertise Available Outside of Government

Field of Expertise	Institutions Service for Expertise Available Outside of Government						
	Research Institutes	Universities	Industry	Environmental/ Consumer	Labor Unions	Trade Unions	Professional Organizations
Data Collection	x	x	x	x	x	x	x
Testing of Chemicals	x	x	x				
Risk Assessment	x	x		x			x
Risk Reduction			x				x
Policy Analysis							x
Training and Education	x	x		x			x
Research on Alternatives	x	x					x
Monitoring	x						x
Follow-up				x			
Enforcement (Inspection)					x	x	
Information to Workers					x	x	
Information to Public				x			

6.2 COMMENTS/ANALYSIS

The Royal Government of Cambodia's policy of providing opportunities for NGOs and public interest groups to collect data and information on chemicals management has not been developed. However, in practice providing and receiving chemicals information between government and civil organizations is broadly implemented through official and/or verbal requests, except for the internal information of the governmental institutions.

Cambodia does not have an NGO and related association law yet – upon registration, NGOs are granted a temporary authorization. However, the government has facilitated and encouraged the establishment and operation of all civil organizations in terms of chemicals management and development in the country. This participation can take a wide variety of formats including advisory, co-management functions, memorandums, agreements, partnerships, contracts, concessions, etc. In addition, civil organizations can work directly with the public regarding chemicals hazard information dissemination, chemicals concerns, and demonstrate the governmental activities in chemicals use to the public. For instance, the research findings of integrated pest management have been provided to the public through workshops, mass media, field school programs, etc.

CHAPTER 7
INTER-MINISTERIAL COMMISSIONS

This chapter describes and analyzes mechanisms which facilitate co-ordination and co-operation among ministries, agencies and other relevant governmental and non-governmental bodies in particular areas of chemicals management. This chapter also provides information about the inter-ministerial commissions related to chemicals management and provides the goals and mandate of the inter-ministerial commissions.

7.1 INTER-MINISTERIAL COMMISSIONS

Chapters 4, 5, and 6 discussed the many institutions having direct or indirect dealings with chemicals management. Even though each of these institutions has specific or individual roles and responsibilities, there are still gaps – some activities cannot be resolved by any one institution, e.g. the implementation of national policy, international conventions and protocols, regional agreements, study research, conflict resolution, and so on. In order to solve the above problems and promote effective implementation of chemicals management policy and technique, the coordination mechanism for managing chemicals has been established under two forms: the inter-ministerial commissions and technical working groups.

Inter-ministerial commissions and other coordination mechanisms have been established for promoting cooperation between governmental institutions, civil organizations, and stakeholders and for facilitating effective chemicals management. The inter-ministerial commissions have three main functions:

a Facilitate and assist line ministries in managing chemicals and other procedures;
b Facilitate, review, and advise line ministries in preparing a national chemicals management plan; and
c Facilitate chemicals management information and technological exchange among governmental institutions, civil organizations, and stakeholders.

Related to managing chemicals, the Royal Government of Cambodia has developed three inter-ministerial committees for facilitating and assisting the line ministries. These are the:

- Inter-Ministerial Committee for the Management of Quality and Safety of Products and Services.
- Inter-Ministerial Technical Committee for Industrial Standard.
- Inter-Ministerial Steering Committee in charge of Facilitation and Implementation of the Basel, Vienna, and Stockholm Conventions.

The membership and responsibility of above three inter-ministerial committees regarding chemicals management is described in Table 7-1.

Table 7-1: Inter-ministerial Commission Involved in Chemical Management

Name Inter-ministerial Commission and Mechanism	Role and Responsibility	Secretariat	Members Parties Involved	Working Procedures	Diagnosis of Current Weaknesses
1. Inter-Ministerial Committee for the Management of Quality and Safety of Products and Services (May 08, 1998)	The committee has the following duties: › To prepare, delegate, and facilitate implementation of respective duties for the lines ministers. › To develop national policy concerning the safety and quality of products and services, the protection of consumers and the honesty of business affairs in conformity with the law on the control of product safety and quality services. › To play a role as the National Codex Committee to fulfill every related technical and other work involved in the policy of international standards of food products. › To have other tasks entrusted by the Royal Government.	Ministry of Commerce	1. Ministry of Commerce 2. Ministry of Industry Mines and Energy 3. Council of Minister 4. Ministry of Environment 5. Ministry of Agriculture Forestry and Fisheries 6. Ministry of Economic and Finance 7. Ministry of Interior 8. Ministry of Health	Facilitate and assist the lines ministries in decision making regarding the management of quality and safety of products and services.	(2)
2. Inter-Ministerial Technical Committee for Industrial Standard (August 01, 2001)	The committee has the following duties: › Provide technical information of standardization › Develop protection and prevention measures responding to production, low quality products, and unsafe products that are possibly dangerous and impact human health › Build up the facilitation of Cambodia's industrial standards › Draft, develop, amend, revise, and approve Cambodian industrial standards and submit to the Minister of Industry, Mine and Energy for final decision › Demonstrate and solve all problems regarding the industrial standards	Ministry of Industry, Mine and Energy	1. Ministry of Industry, Mine and Energy 2. Ministry of Commerce 3. Ministry of Agriculture Forestry and Fisheries 4. Ministry of Health 5. Ministry of Environment 6. Ministry of Public Work and Transport 7. Ministry of Land Management Urban Planning and Construction 8. Royal Academy of Cambodia 9. Royal University of Phnom Penh 10. Royal University of Agriculture 11. University of Health Sciences 12. Cambodia University of Technology 13. Cambodia Trade Chamber 14. Cambodia Development Research Institute 15. Users Association Producers Association	Facilitate and assist the lines ministries in decision making regarding the sub-decree on industrial standard enforcement.	(2)

Name Inter-ministerial Commission and Mechanism	Role and Responsibility	Secretariat	Members Parties Involved	Working Procedures	Diagnosis of Current Weaknesses
3. Inter-Ministerial Steering Committee In charge of Facilitation and Implementation of the Basel, Vienna, and Stockholm Conventions	Inter-Ministerial Steering Committee has the following duties: › Develop and propose policy, law, and national action plan regarding the enforcement and implementation of the Basel, Vienna, and Stockholm Conventions in order to submit to the RGC for review and approval; › Facilitate in enforcement and implementation of the Basel, Vienna, and Stockholm Conventions and promote effective implementation of national policy, law, and relevant plans; › Control, evaluate and ensure the national policy and action plan for implementation of three above conventions responding to the national priorities and development purposes; › Facilitate and promote stakeholders' participation in preparation of national policy and action plan for implementation of three above conventions; › Determine principles and strategies for the RGC to negotiate at the international forum or meeting regarding the three above conventions; › Solicit resources needed for promoting implementation of the national action plan reflecting the obligation of Cambodia as a member of three above conventions; › Enhance public and politicians awareness and disseminate information regarding the main principles and obligation under three above conventions; › Participate in meetings and national, regional, and international workshops regarding the issues related with three above conventions; › Advice and facilitate for all projects, programs, and research activities related with three above conventions; › Monitor and approve the plan and progress report of all projects, and that programs have been implemented regarding all subjects of three above conventions	Ministry of Environment	1. Ministry of Environment 2. Ministry of Foreign Affairs 3. Ministry of Agriculture Forestry and Fisheries 4. Ministry of Industry Mine and Energy 5. Ministry of Health 6. Ministry of Public Work and Transport 7. Ministry of Commerce 8. Ministry of Tourism 9. Cambodian Development Council 10. Department of Custom 11. Municipality of Phnom Penh 12. Ministry of Interior 13. Cambodian Electricity Authority 14. Cambodia Agricultural Research Development Institute 15. Mlop Baitong Organization (NGO)	Facilitate and assist the lines ministries in implementation of conventions and decision making regarding the obligation under the Basel, Vienna, and Stockholm Conventions	(2)

Rank between 1 and 3: excellent (1), adequate (2), or poor (3).

The inter-ministerial committees and coordination mechanisms described above have been established under the national central level, and the members of these inter-ministerial committees and coordination mechanisms have participated from relevant governmental institutions, NGOs, and other national institutes. In general, the chairmanship will be provided to the ministry that is the focal point of committee activities. The inter-ministerial committees have a permanent mandate and the membership of each member in each committee is also permanently valid except it is subject to any request for change from the line ministries or from the inter-ministerial committees.

Other than the chairmanship of each committee, the focal point ministry also provides a secretariat for the inter-ministerial committees and coordination mechanisms. Furthermore, in order to assist the inter-ministerial committees and coordination mechanisms on technical aspects, technical working groups will be established as required, with the membership invited from relevant institutions following the proposal of the chairman of the committee.

Detailed roles and responsibilities of the inter-ministerial committees and coordination mechanisms in managing chemicals have been determined by the governmental ordinance (sub-decree) or by the ministerial ordinance (declaration) of the focal point ministry.

In practice, these roles and responsibilities contain some gaps, such as a lack of a mechanism for receiving public comments as well as feedback from the stakeholders in chemicals management policy development and decision making process. Experience in Cambodia indicates that unless chemical importers and users are involved in dialogue with the government on chemicals management policy, legislation, and management issues, they will tend to do all in their power to ignore what they perceive as “inappropriate” government initiatives.

7.2 MECHANISMS FOR OBTAINING INPUT FROM NON-GOVERNMENTAL BODIES

Related to the three inter-ministerial committees and coordination mechanisms outlined above, Cambodia has opened the participation of public to include:

7.2.1 Non-Governmental Organization Involvement (Civil Organization)

Only a few Cambodia non-government organizations operate in the field of chemicals management. Most of these NGOs’ service involves monitoring and following-up on the implementation of governmental policy regarding chemicals management, and collecting information related to chemicals use and subsequent effects on the health of people and the environment; often they make policy recommendations to governmental institutions for consideration and solution. The core service of these organizations is to be active in raising awareness to the farmers regarding safe use of chemical fertilizers and pesticides. In summary, the participation of civil organizations related to chemicals management is not active but is small-scale at both the community level and public chemicals advocacy roles with governmental policy and management dialogue.

7.2.2 Public Participation

Cambodia has provided opportunities for public participation especially in flowing ideas, giving information on chemicals use, and accidents caused by chemical substances. Presently, the public are very interested in health care and concerned with chemicals-related health effects.

7.3 COMMENTS/ANALYSIS

There is ineffective implementation of roles and responsibilities of the existing committees and coordination mechanisms due to insufficient experiences, inadequate financial resources, and poor mechanism for supporting the operation of the committees. This means that the operation of the secretariat and working groups of the committees is mostly inactive. Most importantly, the operation of the committees and coordination mechanism has little support from governmental politicians.

Most of the members in the committees and coordination mechanism have participated only by providing information or comments through the meeting requested by the committees. The committees have also not been conducting meetings or efforts by working through specific schedules – they will work when necessary and have time.

In general, the existing duty of the committees has not covered all chemicals-related issues, only focusing on chemicals accumulated in food products, standards of chemicals accumulated in industrial products, and chemical substances considered by international conventions. In order to improve general chemicals management, Cambodia shall establish additional coordination mechanisms or extend the roles and responsibilities of the existing mechanisms in managing all kinds of chemicals and all stages of the chemicals life cycle. The reason why we need to upgrade the coordination mechanisms is because the existing mechanisms work in isolation and rarely make information exchanges with other stakeholders.

The information exchange from one mechanism to another can be made through requests, copied or reprinted amterial, and handouts. Each of mechanisms absolutely lacks a communication system for implementation of their mandate as well as chemicals information exchange and sharing working experience.

CHAPTER 8
DATA ACCESS AND USE

Here you shall find an overview of the available data for chemicals management and the related infrastructure, and an analysis of how information is used for local and national chemical risk reduction.

8.1 AVAILABILITY OF DATA FOR NATIONAL CHEMICAL MANAGEMENT

The collection and compiling of data and information related to chemicals management is of little consideration due to insufficient resources, lack of researching programs, and a poor information management strategy. The compilling of the technical data and information related to chemicals management is not of interest to institutions; consequently Cambodia lacks reliable data and information for current as well as future use. In addition, existing data and information is not broadly disseminated to the public and most of data and information is kept by the respective governmental institution. However, chemicals data and information exchange between governmental entities and between governmental institutions and civil organizations can be requested in the form of printed documents.

Governmental printed documents are published mostly as annual reports, observation reports, and survey reports. Those documents rarely detail the problems related to chemical substances, typically only describing technical issues of the institution. Table 8-1 lists the types of printed documents related to chemical substances that are available.

Table 8-1: Quality and Quantity of Available Information

Data Needed for/to:	Pesticides (agricultural, public health and consumer use)	Industrial Chemicals	Consumer Chemicals	Chemical Wastes	Banned Chemicals
Priority Setting	x	x	x	na	fa
Assess Chemicals Impact under Local Conditions	NA	NA	NA	NA	NA
Risk Assessment (environment/health)	NA	NA	NA	NA	NA
Classification/Labeling	x	x	x	NA	x
Registration	x	x	NA	NA	x
Licensing	x	x	NA	NA	NA
Permitting	x	x	NA	NA	NA
Risk Reduction Decisions	x	x	NA	x	NA
Accident Preparedness/Response	NA	NA	NA	NA	NA
Poisoning Control	NA	NA	NA	NA	NA
Emissions Inventories	NA	NA	NA	NA	NA
Inspections & Audits (environment/health)	NA	NA	NA	NA	NA
Information to workers (include farmers)	x	NA	x	NA	NA
Information to the public	x	NA	x	x	x

Note: FA: Full Available, X: Available, NA: Rarely or Non Available

8.2 LOCATION OF NATIONAL DATA

For data retrival and dissemination, there is no formalized coordination between government agencies, NGOs, educational institution libraries, and the national library. For the most part, entities maintain their own documents and computer files specific to their own organization. However, there is no standardized system for document coding or library management, even within individual organizations. In fact, the technical documents prepared by any technical institution have not been broadly disseminated to other institutions, except when requested from other relevant institutions. Cambodia has just only one national library and a few educational institutions libraries, but printed documents have never been sent to the national library or any library belonging to the educational institutions. In the meantime, Cambodia lacks statistical records related to document readers or researchers regarding who has access, what kinds of documents they have accessed, how many documents are needed for accessing, etc.

Electronic files are poorly maintained since most organizastions lack funds for proper computer equipment; Information Technology management is almost non-existent. Internet access is available, both internally and externally via Internet Cafés (used extensively), but Web homepages have not been broadly implememted. Table 8-2 shows what and where national data is stored.

Table 8-2: Location of National Data and Information

Type of Data	*Location(s)*	*Data Source*	*Who Has Access*	*How to Gain Access1*	*Format*
Production Statistics	N/A	N/A	N/A	N/A	N/A
Import Statistics	• Ministry of Commerce, Dept of Kam-Control	• Annual Report • National Conference	• Society at large	• Request	• Hard Copy
	• Ministry of Economic and Finance, Department of Custom	• Annual Report • National Conference	• Society at large	• Request	• Hard Copy
	• National Institute of Statistic	• Statistical Year Book	• Society at large	• Request	• Hard Copy
	• Ministry of Agriculture Forestry and Fisheries	• Annual Report • National Conference	• Society at large	• Request	• Hard Copy
	• Ministry of Industry, Mines and Energy	• Annual Report • National Conference	• Society at large	• Request	• Hard Copy
	• Ministry of Health	• Annual Report	• Society at large	• Request	• Hard Copy
Export Statistics	N/A	N/A	N/A	N/A	N/A
Chemical Use Statistics	• MAFF (agronomy dept.)	• Annual report	• Society at large	• Request	• Hard Copy
	• MOH, (CNM)	• Annual report	• Society at large	• Request	
Industrial Accident Reports	N/A	N/A	N/A	N/A	N/A
Transport Accident Reports	N/A	N/A	N/A	N/A	N/A
Occupational Health Data (agricultural)	• Ministry of Agriculture Forestry and Fisheries	• Annual Report	• Society at large	• Request	• Hard Copy
	• National Institute of Statistic	• National Conference	• Society at large	• Request	• Electronic file/ • Hard Copy

Type of Data	*Location(s)*	*Data Source*	*Who Has Access*	*How to Gain Access1*	*Format*
	• Ministry of Health	• Statistical Year Book • May available at hospitals records	• Society at large	• Request • Buy	• Electronic file/ • Hard Copy
Occupational Health Data (industrial)	• National Institute of Statistic	• Statistical Year Book • Annual Report	• Society at large	• Request, Buy	• Electronic file/ • Hard Copy
	• Ministry of Health	• National Conference • National Action Plan • May available at hospitals records	• Society at large	• Request, Buy	• Electronic file/ • Hard Copy
Poisoning Statistics	N/A	N/A	N/A	N/A	N/A
Pollutant Release and Transfer Register	• Ministry of Environment	• Annual Report • National Conference • National Action Plan • Pollutant Release Inventory	• Society at large	• Request, Buy	• Electronic file • Hard Copy
Hazardous Waste Data	• Ministry of Environment	• Annual Report • National Conference • National Action Plan • Pollutant Release Inventory	• Society at large	• Request, Buy	• Electronic file • Hard Copy
Register of Pesticides	• Ministry of Agriculture Forestry and Fisheries	• Annual Report • National Conference	• Society at large	• Request, Make Copy	• Hard Copy
Register of Toxic Chemicals	N/A	N/A	N/A	N/A	N/A
Inventory of Existing Chemicals	N/A	N/A	N/A	N/A	N/A
Register of Imports	• Ministry of Commerce, Dept of Camcontrol	• Annual Report • National Conference	Society at large	• Request, Make Copy	• Hard Copy

Type of Data	*Location(s)*	*Data Source*	*Who Has Access*	*How to Gain Access1*	*Format*
	• Ministry of Health	• Annual Report • National Conference	Society at large	• Request, Make Copy	• Hard Copy
	• Ministry of Agriculture Forestry and Fisheries	• Annual Report • National Conference	Society at large	• Request, Make Copy	• Hard Copy
Register of Producers	N/A	N/A	N/A	N/A	N/A
PIC Decisions	• MAFF (Dept. Agr. Legislation, Bureau of Agr. Materials Standards)	• Convention document. and report, procedures	• Society at large	• Copy	• Hard copy
POP Decisions	• Ministry of Agriculture Forestry and Fisheries • Ministry of Commerce, Dept of Camcontrol • Ministry of Environment • Ministry of Industry, Mines and Energy • Ministry of Health	• Annual Report • National Conference • National Action Plan • Pollutant Release Inventory • Chemical Import Record	• Society at large	• Request, Make Copy	• Electronic/Hard Copy

Note: The reader should keep in mind the above limitations regarding location of national data and information. Within some sectors, the majority of materials are not subject to chemicals management reporting because they are not considered manufacturing industries, or because they are below chemicals management reporting thresholds. Examples are mining, dry cleaning, etc. For these data and information, POPs release information from other sources has not been included. The reader should also be aware that data and information presented within this profile is not equivalent to a real problems ranking for each industrial sector or the agriculture sector.

8.3 PROCEDURES FOR COLLECTING AND DISSEMINATING NATIONAL/LOCAL DATA

Cambodia has no specific regulations for data collection or dissemination of data related to chemicals management. In general, the governmental institutions have collected the chemicals data according to their own institutional requirements and collected data and information has not been broadly disseminated for the public.

Cambodia has never systematically collected, compiled, or kept data or information related to the chemicals that affect human health and the environment. For instance, the workers of some garment factories are often exposed to noxious chemicals but the detailed study or investigation of these incidents or the toxicity of any substance has not been made; they have only been provided the simple report or notice regarding the accident. The governmental civil institutions are responsible for writing the toxicity report and this involves the participation of police officers, public health agents, labor and vocational training officers.

Data and information collection methodology related to chemicals management can be made through informal or formal approaches. Formal social research methods include surveys, studies based on observations of behavior, and controlled experiments. The informal approach could involve the following methods:

- Observing community and/or governmental members who are to participate in some project and/or some related activities;
- Conduct direct survey and case studies;
- Use of key people in the community and/or governmental ministries to provide information;
- Conduct group discussions; and
- Conduct individual interviews.

8.4 AVAILABILITY OF INTERNATIONAL LITERATURE

Most information related to international literature can be accessed via consultation with international organizations that are working within the field of chemicals management or can be found through libraries and/or bookshops. Cambodians also use the Internet, so most information related to international literature can be accessed online. Table 8-3, below, summarizes the international literature accessible in Cambodia.

Table 8-3: Availability of International Literature

Literature	Location(s)	Who Has Access?	How to Gain Access[1]
Environmental Health Criteria Documents (WHO)	World Health Organization (WHO), Cambodia Resident Representative	Society at large	▸ Consultation in Library ▸ Request and/or Purchase ▸ Internet: www.who.org
Health and Safety Guides (WHO)	World Health Organization (WHO), Cambodia Resident Representative	Society at large	▸ Consultation in Library ▸ Request and/or Purchase ▸ Internet: www.who.org
International Chemical Safety Data Cards (IPCS/EC)	-	-	▸ Internet
Decision Guidance Documents for PIC Chemicals (FAO/UNEP)	▸ FAO Office ▸ MAFF	Society at large	▸ Consultation in Library ▸ Request and/or Purchase ▸ Internet
FAO/WHO Pesticides Safety Data Sheets	-	-	▸ Internet
Documents from the FAO/WHO Joint Meeting on Pesticide Residues	MAFF	Society at large	▸ Consultation in Library ▸ Request and/or Purchase ▸ Internet

Literature	Location(s)	Who Has Access?	How to Gain Access[1]
Material Safety Data Sheets (industry)	-	-	▹ Internet
OECD Guidelines for the Testing of Chemicals	-	-	▹ Internet
Good Laboratory Practice Principles	-	-	▹ Internet
Good Manufacturing Practice Principles	ASEAN- MOH Department of Drug and Food.	Society at Large	▹ Consultation in Library ▹ Request and/or Purchase ▹ Internet
WHO/UNEP Global Env. Library Network	-	-	▹ Internet

8.5 AVAILABILITY OF INTERNATIONAL DATABASES

Availibity of international databases exists through the internet.

Table 8-4: Availability of International Databases

Database	Location(s)	Who Has Access	How to Gain Access
ILO	Switzerland	Interested persons	Internet
IPCS INTOX	Unknown	Interested persons	Internet
Chemical Abstract Services Database	USA	Interested persons	Internet
Global Information Network on Chemicals (GINC)	Japan	Interested persons	Internet
STN Database	Unknown	Interested persons	Internet
Relevant Databases from Other Countries	Unknown	Interested persons	Internet

8.6 NATIONAL INFORMATION EXCHANGE SYSTEMS

The Royal Government of Cambodia recently established the ministerial information exchange network as a primary means of meeting the Cambodian information dissemination and outreach objectives. The network is managed by the National Information Communication Technology Development Authority (NIDA) which was established by Royal Decree on August 23, 2000.

For information regarding chemicals management, the Royal Government of Cambodia will continue to provide the Cambodian public with online access to relevant chemical technical or legal information by operating, maintaining, and expanding, as appropriate, after completion of chemical substances and POPs existing Cambodian databases.

Notice that the flow of information between international organizations and their partners in Cambodia occurs independently in each institution in accordance with its sectors of activity and of interest. Although the government established the information network, national information exchange between various ministerial and public interest groups and NGOs are not always through the network.

It is most popular to operate through different aspects including official and unofficial meetings, workshops, training, project implementation, media programs, coordination mechanisms, and publications in terms of general information as well as sound chemicals management. This approach is intended to work as an interface for information exchange to improve cooperation among government institutions and the public. Numerous public and private Internet sites are in development, which contain information relevant to government institutions and the public.

The government will coordinate and build on those efforts to make information available in the technology and format compatible with the needs of the widest range of the Cambodian public as possible. The government has been considering and must monitor, evaluate, consolidate, and update this chemicals management information.

8.7 COMMENTS/ANALYSIS

- The chemicals management information are identified where greater inter-ministerial cooperation would be mutually beneficial, but where a dialogue is difficult to initiate for a number reasons.

- Tradition line ministries are reluctant to share information. Therefore, they have conducted data gathering independently by each ministry responsible and keep away from common benefit. Without passing the consultation process, chemicals data and information gathered could have some variably and overlapping.

- As mentioned about the national information exchange system, the state information network has just been established but it is not possible to access the existing chemicals management databases and it is impossible to find information or query through this network.

- The existing chemicals information is maintained in six main ministries: Ministry of Agriculture Forestry and Fisheries, Ministry of Commerce (Department of CAMCONTROL), Ministry of Economic and Finance (Department of Custom and Exsice), Ministry of Environment, Ministry of Health, and Ministry of Industry Mines and Energy.

- The medium-term objective of a chemicals information network is to create systematic information exchange with public accessibility and experiences that are important for preparation of the national chemicals implementation plan, chemicals impact assessment, and improvement of coordination of chemicals project management.

- From the governmental viewpoint, the chemicals information gathered in this profile and other information maintained in relevant ministries will be entered to a computer(s) and shared in the governmental information network. The quality of chemicals information will be considered.

- The capacity building for chemicals information management and technology is considered a top priority for access to the national and the international database in a broadly open policy.

CHAPTER 9
TECHNICAL INFRASTRUCTURE

This chapter provides an overview of the technical infrastructure related to analysing chemicals and chemical products. It also provides information related to information systems and computer capacity of national laboratories and professional training programs related to chemicals management.

9.1 OVERVIEW OF LABORATORY INFRASTRUCTURE

Regarding the technical infrastructure for analysing chemicals and chemical products, Cambodia has six main governmental laboratories located in the Ministry of Agriculture Forestry And Fisheries, Ministry of Commerce, Ministry of Environment, Ministry of Health, And Ministry of Industry, Mines and Energy, and Ministry of Water Resource And Meteorology.

Cambodia has been focusing on strengthening capacity for laboratory through upgrading equipment and other facilities, human resource development options, and promoting the role and responsibility in accuracy of chemicals analysis and management. Despite this, those laboratories capability improvements that have been assisted by the government and donor organizations still have limited capacity for both laboratories facilities and technical analysis. This needs to be urgently solved and requires the good will of the government to promote the controlling and managing chemicals and to ensure safe health and the environment.

The current role and responsibility of each of six chemicals laboratories is summarized below:

9.1.1 Laboratory of the Ministry of Agriculture, Forestry and Fisheries

The Laboratory of the Ministry of Agriculture, Forestry and Fisheries is under administrative management of the Department of Agronomy responsible for improving agricultural production through providing technical services and operating activity in agricultural soil quality analysis, fertilizers quality, pesticides formulation and residue analysis. The fertilizer and pesticides analysis provide technical data to support pesticides and fertilizer registration and control. These data are useful for developing training courses for farmers who are the direct users of those chemicals.

9.1.2 Laboratory of the Ministry of Commerce

The Laboratory of the Ministry of Commerce is under the administrative management and execution of the Department of CAMCONTROL and is responsible for improving the quality of all economical goods involved in import/export and trafficking processes in the Kingdom of Cambodia through foods, chemicals and consumers products analysis for effective law enforcement and related services.

9.1.3 Laboratory of the Ministry of Environment

The Laboratory of the Ministry of Environment is under the administrative management and execution of the Department of Environmental Pollution Control and is responsible for supporting action in environmental quality control and assessment of environmental pollutants caused by general waste generation source. In general, this lab plays the active role in chemicals waste control, environmental quality monitoring, and biological sample analysis for biological conservation purposes.

9.1.4 Laboratory of the Ministry of Industry, Mines and Energy

The Laboratory of the Ministry of Industry, Mines and Energy is under the administrative management and execution of the Department of Industrial Technique and is responsible for controlling and upgrading the quality of industrial local products and also is able to analyze industrial liquid waste. This lab works closely with all industrial sectors in Cambodia to analyze industrial products quality and participates in standardization monitoring based on the rules and regulations regarding the industrial management.

9.1.5 National Laboratory of the Ministry of Health

The National Laboratory of the Ministry of Health is under the administrative management and execution of the Department of Drugs and Food Quality Control, specifically responsible for medical quality control by focusing on all chemical substances to be used for pharmaceutical production purposes. This lab plays a very essential role in both drugs and food quality analysis, medical analysis based on legal requirement regarding the people's health care, and the effective management of drugs.

9.1.6 Laboratory of the Ministry of Water Resource and Meteorology

The Laboratory of the Ministry of Water Resource and Meteorology is under the administrative management and execution of the Department of Hydrology, and is responsible for chemical identification contained in water and soil resources (commonly referred to as quality control). This lab provides service to all relevant Cambodian sectors working in public water and soil resources quality. The lab provides service and supports the importance of developing the strategy for exploring water and soil resources management and receives all requests from the relevant sectors in order to analyze the quality of water and soil resources.

Based on the role and responsibility of all governemental laboratories mentioned above, Cambodia has very poor chemicals- and POPs-related laboratory analysis capacity. Cambodia's main problems identified are:

- Lack of good cooperation among laboratory and stakeholders that are responsible for managing emission sources of the chemicals and persistent toxic substances;
- Lack of human resources in operating lab as well as technical expertise related to chemicals analysis and management capacity, and
- Lack of reliable laboratories and equipment for chemicals monitoring and analyzing.

Cambodia's laboratories infrastructure is illustrated in Table 9-1 below:

Table 9-1: Overview of Laboratory Infrastructure for Regulatory Chemical Analysis

Name/ Description of Laboratory	Location	Equipment/ Analytical Capabilities Available	Accredi -tation	Certified GLP1 (yes/no)	Purpose
Department of Agronomical Laboratory	#10, Monireth Blvd, Khan Chamcarmon, Phnom Penh Tel:(855) 12 871 856	HPLC, SP GC	No	No	Control quality of chemical fertilizers and pesticides
Department of CAMCONTROL Laboratory	Ministry of Commerce #50Eo, Street 144, Phnom Penh, Cambodia Fax/Phone: (855) 23 426 166	AAS, SP, GC, HPLC	No	No	Food, chemicals and consumers products analysis
Ministry of Environment Laboratory	#48,Samdech Preah Sihanouk Blvd, Tonle Bassac,Khan Chamcarmorn, Phnom Penh Fax/Phone: (855) 23 210 492 Email: moelab@online.com.kh	AAS and SP	No	No	Environmental quality control (water, soil, air and biological sample) and all kinds of wastes
Ministry of Industry, Mines and Energy Laboratory	#45 Norodom Blvd, Khan Daun Penh, Phnom Penh, Cambodia Fax/Phone: (855) 23 428 263 Tel: 855-11-877319 Email:hcscambodia@yahoo.com	SP,	No	No	Quality control of industrial-handicraft domestic products and waste water analysis
National Laboratory for Drugs and Food Quality Control	#36, Street Geoges Dimitrov, Phnom Penh Cambodia Tel: (855) 23 880 732 (855) 12 810 720	HPLC, SP, TLC, UV, GC	No	No	Quality control of drug and food imported, domestic & trafficking to ensure people good health
Ministry of Water Resource and Meteorology	#47, Norodom Blvd, Khan Don Penh, Phnom Penh, Cambodia Tel: (855) 23 724 389	AAS, SP, and FP (Flames Photometer)	No	No	Control Public Water and Soil Quality

Laboratory					

9.2 OVERVIEW OF GOVERNMENT INFORMATION SYSTEMS/COMPUTER CAPABILITIES

In Cambodia, the use of information-related technological facilities such as computers and computer information networks begun in the 1990s, and most activities served administration management. Technical information storage and dissemination through computer networks was made only for internal use by each governmental institution.

By the year 2000, the Royal Government of Cambodia had developed computer information network capability for use in each governmental institution for administrative services but was limited in the quantity of equipment, service, technique, and human capacity. The governmental network can be accessed with electronic messages and the Internet.

However, technical information storage in computer networks is associated with insufficient information dissemination, lack of technical expertise, and lack of human resource capacity in managing the network. Thus, general technical information has only been stored in personal computers of each governmental technical instituion. Table 9-2 below demonstrates the tehnical information facilities and software programs capabilities available in each governmental institution.

Table 9-2: Computer Capabilities

Computer System/Database	Location	Equipment available	Current Uses
Windows XP Office XP	Ministry of Agriculture forestry and fisheries	Desktop Pentium IV	• Data entry, processing and storage • Internet facility
Windows 2000 Office 2000	Ministry of Commerce Dept of CAMCONTROL	Desktop Pentium II and III	• Data entry, processing and storage • Internet facility
Windows 2000 Office 2000	Ministry of Environment	Desktop Pentium II and III	• Data entry, processing and storage • Governmental administration network • Internet facility
Windows 2000 Office 2000	Ministry of Industry, Mines and Energy	Desktop Pentium II and III	• Data entry, processing and storage
Windows 2000 Office 2000	Ministry of Health	Desktop Pentium II and III	• Data entry, processing and storage

9.3 OVERVIEW OF TECHNICAL TRAINING AND EDUCATION PROGRAMMES

Chemicals training and professional education programs have been conducted at professional institutions to promote local expertise in implementing governmental programs or policy in managing chemicals. The professional institutions include:

- Royal University of Phnom Penh, provided the training on chemistry and environmental science;
- Royal University of Agriculture (Chamkar Doeung), provided the training on agronomy, and animal production and health;
- Cambodia Institute of Technology, provided the training on food chemicals;
- University of Health Science, provided the training on pharmacology;
- National Agricultural Vocational Training College (Prek Leap), provided the training on agronomy, and animal production and health; and

- Royal Academy of Cambodia, provided the training on chemistry and food chemicals.

Of the professional technical training described above, the governmental institutions have also been conducting technical skill training related to chemicals in order to gain understanding and strengthen capacity of governmental staff in the implementation of governmental programs and policy related to managing chemicals; especially for local governmental staff who are directly involved in national program and policy implementation. In general, the training has been organized based on the needs and the requirements of each governmental institution. Most of the training is facilitated by national and international experts in terms of learning-by-doing and classroom training.

Some staff have been received short- and medium-term training abroad and some governmental staff have also been sent to study at the post-graduate level on chemicals management and environmental science. However, these kinds of training have not been broadly organized due to lack of technical and financial resources and poor knowledge of foreign languages.

9.4 COMMENTS/ANALYSIS

Six significant laboratories of Cambodia, particularly located in the governmental ministries play a role in the monitoring of chemicals used in Cambodia covering import, distribution, use, disposal, etc. and analyzing chemicals to support monitoring process and effective management of chemicals in Cambodia. Out of the six laboratories of the governmental ministries, Cambodia has some laboratories located at various high school institutions. Those labs play a very important role in supporting chemistry training for all students who are studying at those high schools; they are an also able to analyze some chemical substances as necessary.

In brief, Cambodia has weak points regarding its laboratory facilities:

- Each of Cambodian laboratories lacks analytical equipment, chemical reagents, and human resoureces for chemical analysis;
- Most of the laboratories are located in Phnom Penh, making it very difficult to analyse chemicals at the provincial level, some of chemical substances need to be immediately analysed after the sample is collected.
- Some governmental laboratories currently have not been creating the network for sharing data on analyzed chemicals and information exchange among laboratories.
- None of the Cambodian laboratories is accreditated by an international laboratory on the quality of analytical findings and sampling exchange.

In order to monitor and analyse chemical substances accumulated in various products, Cambodian laboratories should liaise as a network to assist each other in chemicals analysis and sharing data on analyzed chemicals and information that aims to ensure safe chemicals management. Those laboratories should consider some ideas such as the following:

- Establish branch laboratories at the provincial and municipality level and upgrade the existing laboratories through strengthening the capacity of the staff and officers; offer modern analyzing facilities; supply sufficient analytical reagents; and expand the scope of quality analysis for existing laboratories;
- Establish and improve information infrastructure in order to effectively manage chemicals in Cambodia;
- Strengthen and promote Cambodian laboratories capacity and assist competent Cambodian laboratories to be accreted by future partners on capacity and analytical finding; and
- Promote private laboratories' contribution in sound chemicals management.

CHAPTER 10
AWARENESS/UNDERSTANDING OF WORKERS, FARMERS AND THE PUBLIC

This chapter provides an overview of the mechanisms available to provide information to workers and to the public concerning the potential risks associated with chemicals import and use in Cambodia. The information is divided into three parts: information for workers, information for the general public, and raising public awareness.

10.1 INFORMATION FOR WORKERS AND FARMERS IN CAMBODIA

Cambodia has not prepared specific regulations that require that workers handling chemicals must have knowledge about chemicals safety. The dissemination of the existing legal instruments related to the management, safe handling, and use of chemicals for farmers, workers, and public at large has been rarely operated through mass media such as televisions, radios, newspapers, magazines, posters, and brochures. Instead, chemicals-related research information results of the governmental institutions, international organizations, and NGOs have been provided to the farmers, workers, and public at large through field school programs, public meetings, workshops, and sometime through mass media. These kinds of information dissemination cannot be broadly operated and can only be held locally.

10.2 INFORMATION FOR PUBLIC AT LARGE

Information related to chemicals use, especially related to safe use of pesticides and chemical fertilizers as well as chemicals risk have been disseminated to the public through the mass media. The nature of the information to disseminate for the public at large comprises chemicals use, safe use of chemicals, health protection measures for chemicals users and public, diseases caused by chemicals, chemicals that dangerously affect humans and environment, etc. Furthermore, the relevant institutions related to chemicals management have also published about the implementation of relavent programs and their research documents but have not emphasized specifically on chemicals-related issues that affect people's health and the environment. Almost all documents have only been described about the progress of the project or programs. Those documents have explained a little bit about chemicals risk on the environment and the health. Up to date, the governmental institutions, international organizations, and NGOs have been conducting chemicals education programs which target the public such as:

- Ministry of Agriculture, Forestry, and Fisheries cooperated with international organizations and NGOs and provided information for farmers, workers, and the public at large regarding the use of chemical fertilizers, pesticides, and animal medicine, and methods related to farmers' health protection through field school programs of integrated pest management and improvement of agricultural productivity projects.
- Ministry of Commerce provided information for farmers, workers, and the public at large regarding the use of safety products through televisions, radios, newspaper, and other dissemination documents.
- Ministry of Environment cooperated with international organizations and NGOs and provided information for farmers, workers, and the public at large regarding the legal instruments reflecting aspects of environmental pollution, the national program for prevention of environmental pollution, public health protection, and toxic pesticides, through televisions, radios, newspaper, posters, and other dissemination documents, workshops, and public meetings.
- Ministry of Health cooperated with international organizations and NGOs and provided information for farmers, workers, and the public at large regarding health protection and safe use of pharmaceutical productsm through televisions, radios, newspaper, posters, and other dissemination documents.

- Ministry of Industry, Mines, and Energy cooperated with international organizations and NGOs and provided information for workers, and the public at large regarding the clean production and safe working conditions in factories/manufacturing, through televisions, radios, newspaper, posters, and other dissemination documents in place.
- Specifically, the Ministry of Interior cooperated with international organizations and NGOs and provided information for workers and public at large regarding the danger of using chemical substances for narcotic drug production and social safety, through televisions, radios, newspaper, posters, other related documents, etc. and implemented law enforcement.

10.3 PUBLIC AWARENESS RAISING AND EDUCATION PROGRAMS

The raising of public awareness in Cambodia falls almost entirely on the print media, television, and radio. However, such news coverage and information campaigns about chemicals are inefficient and not of high quality. In addition, specialized education in pesticides and chemical fertilizers to the farmers are inadequate. During the last few years, there has been a lack of good formal and informal training programs in Cambodia related to chemicals. Besides the formal education programs, in general school education has involved studying about chemistry but they have not trained the students on chemicals hazards. By the way, the informal education programs implemented by governmental institutions and civil organizations has been focusing on awareness of chemicals risk and safe use of chemicals, especially awareness on pesticides, chemicals fertilizers, and chemical substances accumulated in food products. However, public awareness is low regarding the chemicals use and safety and its impact on human health and the environment. Cambodia recognized that the governmental institutions were not gaining a deep understanding about chemicals perception and hazard on human health and the environment and were also not yet gaining fresh momentum to promote public awareness on chemicals safety. Up to date, there are very few published education materials to be disseminated to the public regarding the chemicals use and safety. The materials and information that have been published and disseminated in Cambodia regarding the chemical education programs comprise:

1. Environmental Concepts and Issues A Focus on Cambodia, published by Ministry of Environment 1999; sponsored by UNDP/ETAP
2. Drug Information Bulletin (Ministry of Health, 2001)
3. Arsenic Substance Concentrated in Well Water (Ministry of Rural Development cooperated with UNICEF, 2003)
4. Teacher Guide Manual for Primary School Teachers, (MoE, ETAP/UNDP, 1998)
5. Draft Teacher Guide Manual for Primary Monks Education, (MoE, ETAP/UNDP, 1998)
6. Precursors Chemicals Frequently Used in Illicit Drug Production, Published by Secretariat of the National Authority for Controlling Drug
7. Persistent Organic Pollutants (POPs) and International Community Concerns, Published by Enabling Activities for the development of a National Plan for Implementation of the Stockholm Convention, Ministry of Environment, May 2004
8. Pesticides for Crop Protection and Issues, Published by CEDAC 2003

10.4 FUTURE CHEMICAL EDUCATION ACTIVITIES

In order to respond to the reading requirements of Cambodian people and to increase understanding about the chemicals among farmers, workers, and public at large, the governmental institutions managing chemicals have proposed some critical projects to improve awareness on chemicals risk and the safe use and storage of chemicals. Table 10-1 summarizes chemicals education activities for farmers, workers, and the public at large. This table also includes both main targets and timeframes for preparation of such materials and conducting future education activities in Cambodia.

Table 10-1: Future Chemical Education Activities

CHEMICAL EDUCATION ACTIVITIES	TARGET	TIMEFRAME	RESPONSIBILITY
• Food safety training • Chemical use for food preservation and food additive	Students Society at Large	2004-2008	Department of CAMCONTROL
• Composting fertilizer program	National and Provincial Authority and Farmers		Cambodian Education and Waste Management Organization
• Farmer field school of IPM (reduce chemical to bio-pesticide for anti-natural enemies	Farmers	2000-2005	Ministry of Agriculture, Forestry and Fisheries
• Pesticide safe use and effective	Farmers	2000-2006	Ministry of Agriculture, Forestry and Fisheries
• Extension on POPs through POPs technical information sheet	Students Authorities Society at Large	2003-2005	Ministry of Environment
• Training program to the custom on controlling the substances that destroy ozone layer	Customs Officers, CAMCONTROL Officers, and Relevant Institution	2004-2007	Customs and Excise Department, Ministry of Economy and Finance
• Public awareness and incentive program for the automobile air-conditioner	Private Sector Governmental Institution, and Society at Large	2004-2007	Ministry of Environment
• Program for refrigerator and air-conditioner technicans training	Refrigerator and Air-Conditions' Technicians	2004-2007	Ministry of Environment
• Promote cleaner production, use effective raw material improve quality product and reduce quantity of waste (UNIDO)	Industrial Investors	2004-2009	Ministry of Industry, Mines and Energy

10.5 COMMENTS/ANALYSIS

Since 1980, chemicals use education has slowly begun permeating the formal education at the level of primary, secondary schools, high schools, and some universities. From 1993, public awareness on safety storage and the use of chemicals has become the critical subject in general environmental education in the informal education system. Chemicals education is also permeating the level of government officials and especially for the Ministry of Environment official staff.

At present, Cambodia has developed individual ministerial education programs to enhance capacity of governmental institutions, farmers, workers, and society on chemicals' safe use, storage, and disposal plus chemicals-related issues as illustrated in Table 10-1.

It is hoped that soon many trainers will have ability to train workers and farmers through informal education systems related to chemicals use, safe storage of chemicals plus health protection and environment security from the risk of chemicals.

CHAPTER 11
INTERNATIONAL LINKAGES

This chapter describes national participation and involvement in international organizations and agreements concerned with the management of chemicals and to identify problems and develop resolution measures related to chemicals through international and donor agencies' programs and various project assistance.

11.1 COOPERATION AND INVOLVEMENT WITH INTERNATIONAL ORGANIZATIONS, BODIES AND AGREEMENTS

Acceptance of chemicals risk and in contribution with the international community for public health and environmental quality protection, and to avoid dangerous effects of chemicals and persistent toxic chemicals, the Royal Government of Cambodia is working with the international community through the involvement and implementation of international activities and conventions for managing chemicals.

The involvement of Cambodia in cooperation with the international community related to chemicals management has not been a comprehensive implementation of all aspects of those international bodies and agreements. Specifically, Cambodia's activities to be undertaken for achieving the chemicals management objectives under obligations of the conventions or agreements have not been fully operational due a lack of human resources, inadequate experience, and insufficient implementation facilities.

The government's activities in participation with international organizations' programs or activities are summarized in Table 11-1; other Cambodian activities in ratifying the international conventions, protocols, and agreements related to managing chemicals are summarized in Table 11-2 below.

Table 11-1: Membership in International Organizations, Programmes and Bodies

International Organization/ Body/Activity	National Focal Point (Ministry/Agency& Primary Contact Point)	Other Ministries/ Agencies Involved	Related National Activities
Intergovernmental Forum on Chemical Safety (IFCS)	Not Yet Determined Yet (Not a Member Yet)	Not Yet Determined	None
UNEP › IRPTC (International Register of Potentially Toxic Chemicals)- National Correspondent			
› IE/PAC (Industry and Environment Program Activity Center)- Cleaner Production Center	Not a Member Yet	Not Yet Determined	None
International Program for Chemicals Safety (IPCS)	Not Yet Determined (Not a Member Yet)	Not Yet Determined	None
WHO	› Ministry of Health	› Ministry of Environment › Ministry of Agriculture, Forestry, and Fisheries › Ministry of Commerce › Ministry of Industry, Mines and Energy	› Food Safety Program › Hospital Waste Management Program
FAO	› Ministry of Agriculture, Forestry, and Fisheries › Ministry of Commerce	› Ministry of Environment › Ministry of Health	› Food safety program › IPM › Codex Contact Point › Establish national codex committee

International Organization/ Body/Activity	National Focal Point (Ministry/Agency& Primary Contact Point)	Other Ministries/ Agencies Involved	Related National Activities
			› Coordinate technical regulation related to standards of food and formulation services
UNIDO	› Ministry of Industry, Mines and Energy	› Ministry of Commerce	› Standardization Conformance and Metrology Program
ILO	› Ministry of Labor and Vocational Training	› Ministry of Industry, Mines and Energy › Ministry of Commerce › Ministry of Health	› Minor labor prevention program
World Bank	› Ministry of Economic and Finance	› Ministry of Agriculture, Forestry, and Fisheries › Ministry of Environment › Ministry of Health › Ministry of Industry, Mines and Energy	› Health service program › Agricultural productivity improvement program › Safe water supply program
Regional Development Bank (ADB)	› Ministry of Economic and Finance › Ministry of Agriculture, Forestry, and Fisheries	› Ministry of Environment › Ministry of Health › Ministry of Industry, Mines and Energy	› Health service program

Table 11-2: Participation in International Agreements/Procedures Related to Chemicals Management

International Agreements	Status	Primary Responsible Agency	Relevant National Implementation Activities
Agenda 21 - Commission for Sustainable Development	Not Yet Established	NA	NA
UNEP London Guidelines (voluntary procedure)	Not Yet Implemented	NA	NA
FAO Code of Conduct (voluntary procedure)	Member of the Party	› Ministry of Agriculture, Forestry, and Fisheries	Establish farmers field schools on IPM
Montreal Protocol	Member of the Party	› Ministry of Environment	› Ozone day › Develop refrigerants management plan › Public dissemination of ozone destroyed substances and its affected to human health
ILO Convention 170	No information	› Ministry of Labor and Vocational Training	›
UN Recommendation for the Transport of Dangerous Goods	No information	›	›
Basel Convention	Member of the Party	› Ministry of Environment	› Inventory of Used LEAD-ACID BATTERY › Develop National

International Agreements	Status	Primary Responsible Agency	Relevant National Implementation Activities
			Strategic Plan for Managing Used LEAD-ACID BATTERY › Conduct Training Course on Managing of Used LEAD-ACID BATTERY for Safety Environment
London Convention	No information	›	›
GATT/WTO agreements (related to chemicals trade)	Member of the Party	› Ministry of Commerce	› Prepare list on tariffs of 97 goods included chemicals
Chemicals Weapon Convention	No information	›	›
Regional/Sub-regional Agreements (specify) ASEAN Working Group on Chemical Industry	No information	› Ministry of Industry, Mines and Energy	›
PIC Convention	Not a Member Yet	› Ministry of Agriculture, Forestry, and Fisheries	›
Stockholm Convention	Not a Member Yet	› Ministry of Environment	› Develop National Profile on Chemicals Management › Conduct POPs Inventory › Conduct Training Course on POPs Related Issues › Develop National Plan for Implementation of the Stockholm Convention

11.2 PARTICIPATION IN RELEVANT TECHNICAL ASSISTANCE PROJECTS

Over the last several years, Cambodia has received both technical and financial assistance from donor communities for implementing the international programs, agreements, and conventions, especially to develop a national action plan for managing chemicals. Table 11-3 is a summary of these projects.

Table 11-3: Participation as Recipient in Relevant Technical Assistance Projects

Name of Project And Duration	Donor Agency Involved	Objectives	National Contact Point	Cooperative Institutions	Relevant Activities
Capacity Development for the Clean Development Mechanism (CDM) (2003-2005)	Dutch/ UNEP	▸ To generate a broad understanding about opportunities provided by a clean development mechanism	▸ Department Planning and Legal Affairs, Ministry of Environment, #48,Samdech Preah Sihanouk Blvd, Tonle Bassac, Khan Chamcarmorn, Phnom Penh Fax/Phone: (855) 23 218 370 Email: cccap@online.com.kh	▸ Ministry of Industry, Mines and Energy ▸ Ministry of Agriculture, Forestry, and Fisheries ▸ Ministry of Public Work and Transport ▸ Royal University of Agriculture	▸ To increase a broad understanding and develop institutional and human capacity to fully participate in clean development mechanism ▸ Establish a CDM designated institution responsibility ▸ Identify CDM eligible proects
Formulation of the National Adaptation Program of Action to Climate Change (NAPA) (2003-2004)	UNDP/ GEF	▸ Preparation of the National Adaptation Program of Action for Negative Impact of Climate Change to the Agricultural Sector, Water Recourse, Coastal Zone, Forestry, and Human Health	▸ Department Planning and Legal Affairs, Ministry of Environment, #48,Samdech Preah Sihanouk Blvd, Tonle Bassac, Khan Chamcarmorn, Phnom Penh Fax/Phone: (855) 23 218 370 Email: ETAP@online.com.kh	▸ Ministry of Industry, Mines and Energy ▸ Ministry of Agriculture, Forestry, and Fisheries ▸ Ministry of Water Resource and Meteorology ▸ Ministry of Planning and Statistic ▸ Royal University of Agriculture	▸ To assist Cambodia in the formulation of a country-driven rational adaptation program to climate change ▸ To gather available information regarding Cambodia's vulnerability and the adaptation capacity of the country to adverse impacts of climate change ▸ Coordinate the consultation of the government and the public on national adaptation program of action to climate change
National Capacity Development Project (2002-2005)	DANIDA		▸ Department of EU Assistance Coordination of Rehabilitation and Development Committee, ▸ Governmental Building, Preah Sisovat Blvd, Sangkat Wat-Phnom, Phnom Penh Phone:(855) 23 991 149 Fax: (855) 23 981 177 Email : crdb.rith@online.com.kh	▸ Ministry of Environment ▸ Ministry of Industry, Mines and Energy ▸ Ministry of Agriculture, Forestry, and Fisheries ▸ Ministry of Water Resource and Meteorology ▸ Ministry of Land Management, Urban Planning, and Construction	▸ Strengthen laboratory capacity ▸ Strengthen clean production capacity ▸ Strengthen capacity in preparation of state environmental report ▸ Human resource development

Name of Project And Duration	Donor Agency Involved	Objectives	National Contact Point	Cooperative Institutions	Relevant Activities
Inventory of Used Lead-Acid Battery Project (2003-2004)	BASEL	▸ Develop National Strategic Plan for Managing Used Lead-Acid Battery for Safety Environment	▸ Department of Environmental Pollution Control, Ministry of Environment, #48,Samdech Preah Sihanouk Blvd, Tonle Bassac,Khan Chamcarmorn, Phnom Penh Fax/Phone:(855)23 210 492 Email: moepcd@online.com.kh	▸	▸ Inventory of Used Lead-Acid Battery ▸ Develop National Strategic Plan for Managing Used Lead-Acid Battery ▸ Conduct Training Course on Managing Used Lead-Acid Battery for Safety Environment
Refrigerants Management Project (2004-2007)	UNEP	▸ Reduce and Eliminate ozone destroyed substances	▸ Department of Environmental Pollution Control, Ministry of Environment ▸ #48,Samdech Preah Sihanouk Blvd, Tonle Bassac,Khan Chamcarmorn, Phnom Penh Fax/Phone:(855)23 210 492 Email: moepcd@online.com.kh	▸	▸ Develop national action plan in order to eliminate ozone destroyed substances (ODS) ▸ Public Awareness of Ozone Destroyed Substances and Its Affected to Human Health
Enabling Activities for the Development of a National Plan for Implementation of the Stockholm Convention on POPs Project (2003-2005)	UNEP/ GEF	▸ Develop National Action Plan for Implementation of the Stockholm Convention	▸ Department of Environmental Pollution Control, Ministry of Environment #48,Samdech Preah Sihanouk Blvd, Tonle Bassac,Khan Chamcarmorn, Phnom Penh Fax/Phone:(855)23 210 492 Email: moepcd@online.com.kh	▸ Ministry of Agriculture, Forestry, and Fisheries ▸ Ministry of Industry, Mines and Energy ▸ Ministry of Commerce ▸ Ministry of Health ▸ Ministry of Economic and Finance	▸ Develop National Profile on Chemicals Management ▸ Conduct First Inventory on POPs ▸ Conduct Training Course on POPs Related Issues ▸ Develop National Plan for Implementation of the Stockholm Convention
Waste-Econ Project	CIDA		▸ Department of Environmental Science, Royal University of Phnom Penh, Toul Kork, Phnom Penh Tel: 855-11-953505 Email: environment.rupp@everyday.com.kh	▸	▸ Research ▸ Capacity Building ▸ Curriculum development ▸ Organize training course on waste management for relevant governmental officers
Health Reproduction Program (2004-2006)	KFW	Improve mothers' health care through birth spacing action	▸ Department of drugs, food, medical material, and cosmetic, Ministry of Health #8, Ung Po Kun Bldv (str 109), Sangkat Mitapheap, Khan 7 Makara, Tel: 023 880 248	▸	▸ Supply drugs for birth spacing ▸ Gains understanding on the use of drugs for birth spacing

Name of Project And Duration	Donor Agency Involved	Objectives	National Contact Point	Cooperative Institutions	Relevant Activities
			Email: moh_cpn@forum.org.kh		
Obsolete Drugs Program	WHO	Reduce obsolete drugs	▸ Department of drugs, food, medical material, and cosmetic, Ministry of Health #8, Ung Po Kun Bldv (str 109), Sangkat Mitapheap, Khan 7 Makara, Tel: 023 880 248 Email: moh_cpn@forum.org.kh	▸ Mnistry of Health ▸ Private sector	▸ Collect sample of obsolete drugs ▸ Identify and control quality of drugs
Essiontial Drugs Requirement for Mothers and Child Health Care Program	UNICEF	Improve mother and child health care through suppling of drugs	▸ Department of drugs, food, medical material, and cosmetic, Ministry of Health #8, Ung Po Kun Bldv (str 109), Sangkat Mitapheap, Khan 7 Makara, Tel: 023 880 248 Email: moh_cpn@forum.org.kh	▸	▸ Govern on drugs and medical instruments management
IPM Project (1993-2005)	DANIDA FAO APIP WB	Train farmers on IPM technique aim to reduce the pesticides use	▸ Department of Agronomy and Agricultural Land Improvement, MAFF #14, Minireth Street, Sangkat Toul Svay Prey II, Chamcar Morn District, Phnom Penh Cambodia Tel: (855) 23 218 752 (855) 23 270 485 Email:ipm.apip@online.com.kh	▸ Provincial and Municipality Agricultural Departments ▸ Provincial Organizations	▸ Operating farmer field school ▸ Establish farmer clubs (IPM) ▸ Create farmer comunities
Nutrition Investment Plan (2003-2007)	UNDP/ GEF	Eradicate unsufficient iodine issues in Cambodia	▸ Ministry of Planning	▸ Ministry of Industry, Mines and Energy ▸ Ministry of Commerce ▸ Ministry of Education, Youth and Sport ▸ Ministry of Rural Develeopment	▸ Control iodine substance contained in salt

Name of Project And Duration	Donor Agency Involved	Objectives	National Contact Point	Cooperative Institutions	Relevant Activities
Agricultural Productivity Improvement Project (APIP) (1999-2004)	WB	Build human capacity, infrastructure, and develop technical and legal standards	▸ Department of Agronomy and Agricultural Land Improvement, MAFF #14, Minireth Street, Sangkat Toul Svay Prey II, Chamcar Morn District, Phnom Penh Cambodia Tel: (855) 23 220 886 Email:ipm.apip@online.com.kh	▸ Provincial and Municipality Agricultural Departments	▸ Survey pesticides trafficking on the local markets ▸ Analyse quality of pesticides ▸ Identify pesticides needs to ban for use ▸ Demonstrate the effectiveness of pesticides in order to destroy insect and prevention of farmer field disease ▸ Extense how to get effectively use of pesticides to the provincial agricultural department staffs and farmers
Provincial and Minicipality Water Supply and SanitationProject (2003-2008)	WB	Supply clean water to poor people in provincial and municipality	▸ Department of Clean Water, Ministry of Industry, Mines and Energy #45, Norodom Blvd, Phnom Penh, Cambodia Tel/Fax: (855) 23 210 272 Email: watersector@bigpond.com.kh	▸ Phnom Penh Municipality Water Supply Authorities	▸ Step by step operated and in bidding process
Provincial and Minicipality Water Supply and SanitationProject (2000-2005)	ADB	Incease provincial and municipality clean water supply	▸ Department of Clean Water, Ministry of Industry, Mines and Energy #45, Norodom Blvd, Phnom Penh, Cambodia Tel/Fax: (855) 23 210 272 Email: watersector@bigpond.com.kh	▸ Provincial and Municipality Water Supply Authorities	▸ Step by step implemented in procincial and municipality areas
Promotion of Cleaner Industrial Production in the Kingdom of Cambodia (2003-2007)	UNIDO	To generate understanding on cleaner production and promote implementation of manufacturing's cleaner production in Cambodia	▸ Department of Industrial Techniques, MIME #45, Norodom Blvd, Phnom Penh Cambodia Tel/Fax: (855) 23 428 263	▸	▸ Start up
Project for Development of Law on Industrial Standard (2003-2004)	UNIDO	Prepare the law on Cambodia Industrial Standard	▸ Department of Industrial Standards, MIME #45, Norodom Blvd, Phnom Penh Cambodia Tel/Fax: (855) 23 216 086	▸	▸ Law on Cambodia Industrial Standard has not passed yet

Name of Project And Duration	Donor Agency Involved	Objectives	National Contact Point	Cooperative Institutions	Relevant Activities

At the present, Cambodia has no specific policy to place conditions and define measures to put any pressure on donor-assisted projects related to chemicals management. The Royal Government of Cambodia has placed high priority on the facilitation and coordination with all grant projects. The Royal Government of Cambodia is monitoring the projects' implementation findings and providing advice and recommendations for projects on how the objectives mentioned in agreement and/or memorandums of understanding can be achieved. The government has always trusted the donors to preform the audit for the grant projects.

As mentioned in chapter 6, the government has not determined the procedure for facilitation of any grant project, but some coordination can be made through co-management functions, memorandums, agreements, partnerships, contracts, concessions, etc, to avoid overlapping activities.

Specifically, the government has defined the procedure for strictly controlling action for the loan projects. The loan projects have to get approval from the national assembly. The financial audit and controlling of the project implementation is the duty of the Ministry of Economic and Finance of Cambodia. At the present Cambodia has no plan to borrow money from external fianacial sources for chemicals management actions.

11.3 COMMENTS/ANALYSIS

Current activities have not fully met all of the requirements of the international agreements. Many of the chemical concerns are the result of an inadequate chemicals management infrastructure and human resources capacity. Cambodia has recognized that current national capacity building for chemicals management at the state and public levels are an important solution for implementing the international agreements.

Cambodia is well positioned and coordinated in terms of international activities and agreements in the area of chemicals management. The Royal Government of Cambodia strongly supports the integration of international agency programs into national programs to achieve sustainable development goals, poverty alleviation, as well as the improvement of people's health and a safe environment. Most importantly, Cambodian institutions could work well with international organizations and the existing national coordination committees in identifying chemicals-related problems and in defining specific measures for capacity building among governmental institutions and stakeholders for chemicals management and successful project implementation under support from donor agencies.

From these reasons, Cambodia has established inter-ministerial coordination commissions for the implementation of international projects. The execution of the roles and responsibilities of these commissions is fundamental for chemicals management for all parties concerned and within the legal framework to ensure the protection of health and a safe environment.

In order to improve the effectiveness of international programs in Cambodia, the following recommendations should be made are:

- Promote a participatory planning process among international agencies programs especially with line ministries;
- Improve local capacity in participating in implementation of the plan;
- Pay more attention to participation among all the existing coordination mechanisms;
- Share information and experiences gained from programs that are currently being implementing or have already been implemented,
- International donors should provide assistance to the government regarding law enforcement and/or be involved in chemical impact assessment and governance activities;
- International donor assistance projects taking place in Cambodia should consider and accomodate Cambodia circumstance and local conditions; and
- Provide opportunities for governmental technical staff who work with relevant programs for:
  - Better communication at the government level and between the government and the donor,
  - Correct identification of priorities,
  - Achievement of common goals regarding people's health protection and a safe environment, and
  - Building capacity of the local staff on how to work at the international level.

The Royal Government of Cambodia expects that it will not have constraints with donor assistance programs or international agreements if the above recommendations can be resolved and implemented.

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Issues involving Chemical Substances
Cambodia

1. Assessment of Chemical Risks

- It is relevant to systematic assessment mechanism in which Cambodia has built the skills on classification and labeling of chemicals and developed a spatial strategy plan such as Industry, Agriculture, Transportation and Consumer Products for implementing the GHS. It is intended to stimulate the effective implementation of GHS and Cambodia has prepared regulation (sub-decree) in which it is being screened and will be applied soon.

- Risk assessment of hazardous chemical and risk management has been seriously controlled, especially some hazardous chemical substances include: Mercury and unintentional POPs, on top of that, Cambodia has also taken part in complying with the regional project involving this assessment.

- Regarding the vulnerable assessment strategy and environmental monitoring through the toxicological and epidemiological data so as to assess the chemical impacts on human health and environment has not been prepared resulting from the limited both human resources and equipments.

2. Sound Management of Toxic chemicals:

- with support from both technical and financial support from Swedish Government via KemI, we are strengthening the capacity of institutions concerning SAICM and preparing strategy plan to integrate the action plan on sound chemical management into national development plan.

- With the aim at minimizing the chemical effects, some work plan is being setting up such as restricted and banned list of toxic and chemical, National Chemical Profile, National implementation plan for implementation of the Stockholm Convention, National strategy on GHS implementation, Regulation for GHS implementation, etc.

- To prevent the human health and the environment from the impact of hazardous chemical substances, Cambodia has ratified some international conventions such as Vienna, Basel and Stockholm conventions and organizing the national plan for implementing these conventions including the reduction and elimination of the uses of hazardous chemical substances such as POPs, Ozone-depleting substances, aside from that there are still some other poisonous chemicals, especially pesticide and industrial chemicals is also prohibited.

- There is only mercury, so far, being thoroughly managed for its hazardousness and being prepared national strategy plan on waste management and mercury proliferation in order to minimize the impacts of mercury and its waste.

- Some activities have been undertaking to slow down the agricultural chemical use including IPM, awareness raising and education programme to farmers on the impacts of pesticide and advise them alternative products.