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CHEMICALS

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This paper was prepared by Dr. Alice Sharp, for the Regional Implementation Meeting for Asia and the Pacific ahead of the eighteenth session of the Commission on Sustainable Development. The views expressed herein are those of the author and do not necessarily reflect the views of the United Nations.

List of Acronyms

AP	Asia and the Pacific
ASEAN	Association of Southeast Asian Nations
ASGM	Artisanal and Small Scale Gold Mining
AUDMP	Asia Urban Disaster Mitigation Program (AUDMP)
BAT	Best available Techniques
BEP	Best Environmental Practices
CIEN	Chemical Information Exchange Network
CSD	Commission for Sustainable Development
DDT	Dichlorodiphenyltrichloroethane
DGEF	Division of Global Environment Facility Coordination
DTIE	Division of Technology, Industry and Economics
EEB	European Environmental Bureau
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GHS	Globally Harmonized System of Classification and Labelling of Chemicals
GLONESA	Global Network for Safety in Chemical Production
GPA	Global Plan of Action
HCB	Hexachlorobenzene
HCHs	Hexachlorocyclohexanes
ICCM	International Conference on Chemicals Management
IFCS	Intergovernmental Forum on Chemical Safety
IGOs	Intergovernmental organizations
ILO	International Labour Organization
INTOX	Institute for Toxicological Studies
IOMC	Inter-Organization Programme for the Sound Management of Chemicals
IPCS	International Programme on Chemical Safety
IPM	Integrated Pest Management

IUPAC	International Union of Pure and Applied Chemistry
MDG	Millenium Development Goals
NCPCs	National Cleaner Production Centers
NGOs	Non-governmental Organizations
NIPs	National Implementation Plans
ODS	Ozone Depleting Substances
OECD	Organization for Economic Co-operation and Development
OPS	Overarching Policy Strategy
OSH	Occupational Safety and Health
PAHs	Polycyclic Aromatic Carbons
PBTs	Persistent, Bioaccumulative and Toxic substances
PCBs	Polychlorinated Biphenyls
PCDD	Polychlorinated dibenzo-p-dioxin
PCDF	Polychlorinated dibenzofurans
PIC	Prior Informed Consent
PICTs	Pacific Island Countries and Territories
POPs	Persistent Organic Pollutants
PRTRs	Pollutant Release and Transfer Registers
PTS	Persistent Toxic Substances
QSP	Quick Start Programme
RIM	Regional Implementation Meeting
SACEP	South Asia Cooperative Environmental Programme
SAICM	Strategic Approach to International Chemicals Management
SIDS	Small Island Developing States
SMC	Sound Management of Chemicals
SPREP	South Pacific Regional Environment Programme
UNCED	UN Conference on Environment and Development
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe

UNEP United Nations Environment Programme
UNIDO United Nations Industrial Development Organization
UNITAR United Nations Institute for Training and Research
WHO World Health Organization
WSSD World Summit on Sustainable Development

DRAFT

EXECUTIVE SUMMARY

MAIN OBJECTIVE:

1. This report aims to provide background information on the theme of chemicals at the Regional Implementation Meeting (RIM) for the Asia-Pacific region in preparation for the 18th and 19th sessions of the Commission for Sustainable Development (CSD) in 2010 and 2011, respectively. The report reviews the general status of chemicals usage in each subregion, implementation of sound management of chemicals, evaluating tendencies and challenges for different subregions. It also analyzes commitments in chemicals management and proposed policy options for future sound management of chemicals.

Key messages from the report

- Increasing production and consumption of chemicals in the region can cause adverse impacts to human and the environment; therefore, sound management of chemicals is fundamental.
- Management of chemicals in the Asia-Pacific region is still largely under-addressed. The impacts of mismanagement have been observed in terms of various environmental and health related problems.
- Due to variations in levels of economic development, sound management of chemicals in developed and developing countries has to focus on different areas. Increasing production and consumption of chemicals in developing countries should be a major concern, as these countries do not yet have sufficient infrastructure or capacity to support sound management of chemicals.
- Political commitment, strong institutions, and appropriate governance are essential for implementing sound management of chemicals.
- Strengthened international cooperation plays an important role in the implementation of different initiatives in chemical management as the movement of chemicals extends beyond national boundaries.

Summary of the main findings

2. Much of the world's production and consumption of chemicals and hazardous substances is located in Asia-Pacific. Consequently, more impacts can be observed in developing countries because they often lack sufficient information on the risks of chemicals as well as appropriate methods to assess and monitor risks generated by mismanagement of chemicals. Therefore, the challenge for the regions would be to assist developing countries to set up their national profiles in order to identify the gaps which exist within the country and to develop national implementation plans for future implementation. International organizations, with the support from countries with advanced chemical management systems, should give highest priority to strengthening of national capabilities to manage chemicals safely. There is a clear need to improve the coordination of education, training and technical assistance activities among different organizations and at different levels. On the national government level, the government must ensure that sound management of chemicals is incorporated into national priorities to guarantee that chemicals are used and managed in a sustainable manner. Participation of stakeholders and enhanced education programmes also support long-term success of implementation.

1. Setting the scene

3. Asia and the Pacific is a region with high diversity in terms of population, natural resources, and economic development. It comprises five subregions: Central Asia, North-East Asia, South Asia, South-East Asia, the Australasia and the Pacific.

4. The Central Asia subregion comprises five countries in economic transition: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan. Common environmental issues in this subregion are problems of land degradation, degrading water quality, loss of genetic diversity, and low efficiency of irrigation system. The decrease in fertility of agricultural lands poses a serious threat to food security in the region. With regard to water resources, agricultural run-off is the main source of water pollution in the Central Asia subregion. Extensive agricultural activity in the subregion is an important factor that may cause pesticide over usage, water pollution and water management problems.

5. The North-East Asia subregion consists of 6 countries. Within the subregion, Japan and the

Republic of Korea experienced rapid post-World War II economic growth in which natural resources and agricultural areas were converted into urban and industrial sites. In other countries arable land also decreased, largely due to land degradation.

6. The South Asian subregion has a population of about 1.36 billion. Less than two-fifths of South Asia's land is arable, mainly due to unsustainable agriculture. In the arid and semi-arid areas, desertification has been a major problem.

7. South-East Asia has an area of approximately 4,000,000 km². As of 2004, more than 593 million people lived in the region, more than a fifth of them (125 million) on the Indonesian island of Java. Land conversion was intensified as a result of commercial logging and expansion of agriculture areas for commercial crops. Although the region's economy greatly depends on agriculture, manufacturing and services are becoming more important.

8. The Australasia and the Pacific subregion is very diverse and encompasses a wide variety of geographical features, populations, cultures, economies and politics.

9. In general, the region is the world's most populated continent comprising more than half of the world's population, expected to double within this century. Consequently demands for food continue to grow, and are forecast to increase by 40% from 2000 to 2025. Meanwhile, there is loss of food growing land to non-food crops, urbanization, degradation of land resources and climate change that may have impact on chemicals use and hazards. While globalization is facilitating an efficient transfer of food, it also increases bio-security risks from transboundary pollutants, diseases, and migration of non-native species.

10. Among all factors, industrialization has become one of the most important sources of economic growth of most countries in the region, and thus has increased the production and consumption of industrial chemicals. Although the agricultural sector continues to grow, it is declining in relative importance in AP. Future increases in food production will require a focus on developing more efficient, rather than more intensive agriculture production models in order to halt the increasing use of chemical fertilizer and pesticides that negatively affect biodiversity and health.

11. Climate change is one of the main issues for the AP region. The increasing global concentration of carbon dioxide and other greenhouse gases, and the gradual warming of the atmosphere continue to be a major concern for many countries. The Pacific Island Countries and Territories (PICTs) and the Small Island Developing States (SIDS) are extremely vulnerable to climate change and sea-level rise because of their low elevation. These islands are at the mercy of natural disasters, which pose a major threat to marine and coastal ecosystems, tourism assets, human settlements and infrastructure.

12. In summary, each subregion within Asia and the Pacific; East Asia, South Asia and Indonesia is challenged by large populations, and must prioritize policy and take action to slow the rate of land degradation, and restructure the agricultural sector in order to improve the productivity and sustainability of agriculture. Southeast Asia and the Pacific Islands are also challenged by population growth and restructuring to reduce income dependence on agriculture. Central Asian economies have experienced and recovered from the big adjustments and instability of the last decade. However, their serious challenges include persistent poverty and undernourishment, desertification and infrastructure development. South Asia is challenged by rural poverty and food insecurity, despite strong progress of agricultural production in the last decade. As for the SIDS, the situation differs from bigger countries in the Asia-Pacific region due to small island sizes, isolation and scattered nature. Major effects include high population densities, distance from main trading centers, small markets, fragile ecosystems and frequent natural disasters that cause harm to these economies.

1.1 Status of chemical usage in the subregions

13. Countries in the AP region can be grouped into three categories based on the characteristics of chemical usage; 1) countries that have high production and consumption with the high volume export (e.g. Japan, Republic of Korea, and China); 2) countries with moderate to high consumption and production with most of production for domestic consumption (e.g. India, Thailand, Australia, and Vietnam); and 3) countries that rely on importing of chemicals (e.g. Cambodia, Mongolia, Sri Lanka, Pakistan, and Pacific Islands countries).

- **Central and North-East Asia:** In this subregion most pesticides are used for agricultural purposes. The industrial compounds have introduced technological innovation and benefits to

industries and thus have been significantly produced in some countries of the subregion such as Japan, China and the Republic of Korea. Major chemicals in the subregion include PCDD, PCDF, Polychlorinated Biphenyls (PCBs), Polycyclic aromatic hydrocarbons (PAHs), DDT and Hexachlorocyclohexanes (HCHs). In terms of hotspot areas¹, the subregion is home to many hotspot areas for different kinds of chemicals. The countries in economic transition have a large quantity of Persistent Toxic Substances (PTS) that is obsolete and unneeded. In Kyrgyzstan, obsolete pesticides such as aldrin and DDT were buried with insufficient information regarding quantity and location of the sites. Tajikistan was one of the region's leading users of pesticides with lack of control of obsolete pesticides. As for China, although production and usage of DDT and HCHs have been officially banned since 1983, organochlorine pollutants found in the environment around the delta region are most likely derived from organochlorine pesticide residues in agricultural soils (UNEP, 2002b).

- **South Asia:** The following 21 compounds, or groups of compounds, were identified as priority PTS chemicals when magnitude of use, environmental levels and human and ecological effects were taken into account: aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, hexachlorobenzene, mirex, toxaphene, PCBs, dioxins, furans, atrazene, endosulfan, lindane, phthalates, PAHs, pentachlorophenol, organotin, organolead and organomercury compounds. Concerning the hot spots in the subregion, stockpiles of obsolete pesticides were found mainly in India, Pakistan, Sri Lanka, Nepal, Bhutan, Iran and Bangladesh. Waste incinerators, the pulp and paper industry, and chlorine-based manufacturing units as a source of emission of PCDD/PCDF were identified in India and Pakistan. PCB contaminations were found at the ship-dismantling sites in coastal areas of India, Bangladesh and Pakistan (UNEP, 2002c).

- **South-East Asia:** Chemicals are used extensively in the subregion for both agricultural and industrial purposes. Several types of chemicals are being used in the region both for direct use and for production of further value-added products. Petroleum products ranked as the most abundant chemicals imported, followed by industrial chemicals, fertilizers, pesticides (agricultural, public health and consumer use) and consumer chemicals (pharmaceuticals, cosmetics and disinfectants), respectively. Most countries in the region have introduced regulatory and administrative measures to ban the use of

¹ The term refers to areas that have used or stored chemicals in large quantities and where significant concentrations of chemicals are present in the environment of the area.

several chemicals both in agricultural and industrial sectors. (UNEP, 2002a). Contaminations of chemicals remain in certain areas of the subregion; these areas are called hot spots. Major chemical hot spots in the subregion include the southern part of Viet Nam where, between 1962 and 1971, Agent Orange and other herbicides were sprayed for defoliation. Environmental samples from the area showed elevated polychlorinated dibenzo-p-dioxin (PCDD)/ polychlorinated dibenzofurans (PCDFs) and dioxin levels (Schechter *et al.*, 2001).

- **Australasia and the Pacific:** PTS pesticides have been used in the past throughout the region, although the level of usage has been generally low by world standards. The primary uses were in crop production, termite control, general household and public health applications, and for vector control. The existence of hot spot areas has been known for many years. However, a detailed assessment of the problem was only carried out in the late 1990s (Burns *et al.*, 2000). Numerous hot spots have been identified, consisting mainly of stockpiles of hazardous wastes and obsolete chemicals, pesticides and transformer oils. Over 100 contaminated sites were identified, of which 54 were assessed as needing major remediation work (UNEP, 2002d). Significant efforts will be required for remediation of these sites. High levels of DDT have been found at former cattle dip sites in Australia. About 1,700 former cattle dip sites in northern New South Wales, Australia await remediation (Miller *et al.*, 2002).

1.2 Challenges for sound management of chemicals

1.2.1 Different challenges faced by subregions/countries in Asia-Pacific

- **Central Asia:** Application of agricultural pesticides is of major concern. Pesticides, nitrogen and phosphate compounds are prevalent in water systems, which threaten ecologically sensitive areas and potable water supplies. It has been estimated that the run-off from agricultural fields contains an average of 25% of the nitrogen, 5% of the phosphates and 4% of the pesticides used in the field. Their concentration in the run-off is up to 5-10 times higher than the maximum allowable concentration by law. The Central Asia subregion is faced with major industrial pollutants, such as heavy metals contained in effluents from mining and metal-related industries, and toxic levels of organic substances such as nitrogen and cyanides (UNEP, 2004a).

- **East Asia:** Environmental issues that require highest priority include atmospheric pollution, degradation of freshwater resources, degradation of the marine environment, desertification, land degradation and deforestation, biodiversity loss, natural disasters, etc. The energy issue is another common concern in the subregion, because it exerts major pressure on the atmosphere and causes other types of environmental degradation. In addition to the issues mentioned, social and economic challenges such as the prevalence of poverty, poor food security, and increasing population and urbanization also require attention (UNEP, 2004d).

- **South Asia:** Hazardous waste treatment/disposal is a major concern in chemical management as consumption and production rates are high and residues from such activities are also high. Chemical accidents in industries, as well as during transportation, are believed to impose risks to human and environmental health in the subregion. (UNEP, 2004b)

- **South-East Asia:** The major concern in the subregion is the increase of toxic chemicals and transboundary pollution. The issue relates to the movement and dumping of hazardous waste materials into less developed nations in Southeast Asia. Among the chemicals of primary concern are those that have been banned in other countries because of their associated environmental problems. These include Persistent Organic Pollutants (POPs) that are harmful to the environment and people. Frequently, there is inadequate enforcement of environmental policies and regulations, allowing illegal industrial activities. Given the wide diversity in the Southeast Asian countries' circumstances, subregion-wide collective actions need to be complemented with intra-regional and individual national initiatives (UNEP, 2004c).

- **Australasia and the Pacific:** The challenges that have regularly been identified include loss of biodiversity, threats to freshwater resources, degradation of coastal environments, climate change and sea level rise, and land and sea based pollution. Behind each of the issues is a relatively complex set of conditions, pressures and responses as each island nation has its own distinct socio-economic conditions and environmental characteristics (UNEP, 2004e).

1.2.2 Emerging opportunities as a result of rapid economic growth and social change

14. The chemical sector plays a vital role in the economic development of every country. Realizing the importance of this sector, sound management of chemicals, thus, also plays a crucial role in ensuring that adverse impacts can be avoided. With globalization, opportunities in proper management of chemicals have emerged as countries' economies have developed. Listed in this section are some of the issues that, if effectively implemented, will strengthen economic development of a country.

- Reduction of dependence on use of agricultural chemicals
- Substitution of hazardous and radioactive chemicals with other less dangerous and toxic ones
- Regular evaluation and monitoring of risks to health and ecosystems
- Standardize the classification, labeling and application of chemicals
- Establish mechanisms and institutional systems to reduce risks of chemical products
- Promote research, monitoring and exchange of information on hazardous, toxic, and radioactive chemicals as well as precautionary measures to minimize risks
- Prevent the production and illegal trafficking of hazardous, toxic, and radioactive chemicals.

1.3 Most challenged subregions

15. South Asia is the second fastest growing economy and faces new problems as a result. Cultivation policies to increase revenue from agriculture have resulted in deforestation. Unsustainable agriculture (India, Bangladesh, and Pakistan) has resulted in increasing soil acidification and salinization. Desertification has also become a major threat within arid and semi-arid areas of South Asia. Water erosion is one of the causes of the removal of nutrient-rich soils in the Himalayas.

16. As for Central Asia, desertification has become a pressing problem in the subregion. The area of desertified lands in Kazakhstan is over 66 percent of its total territory. In Kyrgyzstan, about 40% of pastures are degraded. Turkmenistan is in the zone of Central Asian deserts, and its northern territory is a part of the Aral Sea ecological disaster. In the case of Uzbekistan, deserts and semi-deserts occupy some 80% of the territory.

2. Commitments for Sound Management of Chemicals (SMC) at country level

17. Most countries, including a vast majority of developing countries and countries with economies in transition, have adopted various international commitments towards sound management of chemicals. Chapter 19 of Agenda 21 was the world's first global consensus surrounding the concept of sound management of chemicals, which was reconfirmed at the Johannesburg Summit in 2002.

2.1 Objectives

18. In general, the implementation of Agenda 21 aims to ensure that chemicals are used and produced with minimum effects on human health and environmental quality. As the successful implementation of these programme areas depend on intensive international work, it is also important to develop means of communications at the international level to ensure harmonization of implementation; classification and labeling of chemicals, information exchange on toxic chemicals and chemical risks, and the prevention of illegal international traffic of substances.

2.2 Commitments to chemical management by relevant countries

19. Governments at the appropriate level, with the support of the relevant international and regional organizations, should:

- Integrate chemicals management into national development priorities (e.g. Cambodia, India, Kazakhstan, Kiribati, Kyrgyzstan, Mongolia, Nepal, and Thailand). Programmes can enhance interministerial coordination, access to and exchange of information, stakeholder participation, coordinated priority setting, and integration of chemicals management activities into national development planning processes.
- Develop a sound institutional and programmatic national framework such as the project on national profile of chemical management infrastructure.
- Promote ratification and implementation of relevant existing international conventions on occupational health and safety, and environment. Status of ratification can be found in Appendix A.
- Encourage implementation of existing internationally recognized standards, tools and approaches for environment and health and protection from chemicals, such as the Globally Harmonized System (GHS) of Classification and Labeling of Chemicals and FAO Code of

Conduct on the Distribution and Use of Pesticides, and Pesticide Management (Appendix A). As for PRTRs, in 2007, 17 OECD countries including Japan, Korea, and Australia have been actively operating the programme.

- Revise legislation and enforce existing regulations.
- Promote participation of the private sector and non-profit civil society in chemicals management.

2.3 Summary of considerable commitments and priorities

20. In this section, potential commitments are grouped in accordance with key objectives listed in the Overarching Policy Strategy of SAICM. It should be noted that, sound management of chemicals covers broad aspects in a variety of working areas; therefore actions that should be taken are innumerable. The following listed commitments are those considered as high priorities.

2.3.1 Risk Reduction

21. Governments should develop national chemical profiles and implementation plans for SMC in order to identify gaps of knowledge of the country. Pollution prevention and cleaner technology should be employed. Establishment of National Cleaner Production Centers should be expanded to cover more countries. Development of emergency preparedness and response plans is also helpful in reducing chemical risks.

2.3.2 Knowledge and Information

22. In terms of chemical inventory, CO₂ and Ozone Depleting Substances (ODS) are well inventoried; inventory projects should be expanded to cover more types of chemicals such as heavy metals. Other possibilities include development, validation and sharing of reliable, affordable and practical analytical techniques for monitoring substances, and strengthening the exchange of technical information among the academic, industrial, governmental and intergovernmental sectors.

2.3.3 Governance

23. In order to integrate SMC into national development priorities, the country needs to review national legislation, align it with international agreement requirements, and establish an

approach/mechanism for identifying national chemicals management priorities. Governments should promote the ratification and implementation of all relevant international instruments on chemicals and hazardous waste.

2.3.4 Capacity-building and technical cooperation

24. Following the preparation of national chemical profiles, gaps in SMC can be identified. Specific programmes for scientific and technical training of personnel for such countries can be established. To support the standard testing of chemicals, national or regional laboratory facilities, complete with modern instrument and equipment, including those necessary for testing emissions and operating according to national standards should be set up. Training programmes for personnel involved with SMC are necessary.

2.3.5 Illegal international traffics

25. To control illegal movements of hazardous compounds, countries should assess the extent and impact of illegal traffic at the international, regional, subregional and national levels. Internationally, a global information network should be established, including early warning systems across international borders. National legislation to prevent and punish illegal traffic in hazardous substances should be in place.

3. Review of Implementation

3.1 International activities and instruments related to chemicals management

3.1.1 International agreements & instruments concerning sound management of chemicals

26. Various legally binding and non-binding, multilateral agreements also reflect a global interest in SMC, including among others:

(a) Strategic Approach to International Chemicals Management (SAICM): a policy framework to foster the sound management of chemicals adopted by the International Conference on Chemicals Management (ICCM) on 6 February 2006 in Dubai. The Secretariat of SAICM facilitates meetings and inter-sessional work of ICCM; eight regional meetings have been held. The network of Strategic Approach stakeholders has been established in the form of focal points of national, regional,

non-governmental, and intergovernmental organizations. SAICM also provide guidance to stakeholders on the initiation of project proposals through six application rounds for the Quick Start Program (QSP) trust fund (CHEM UNEP, 2007).

(b) The International Labour Organization (ILO) Convention No. 170 and 174 concerning safety in the use of chemicals at work, i.e., moving from a single chemical to all chemicals affecting workers. As a result International Occupational Safety and Health Information Centres (CIS) were established in several countries (Appendix A).²

(c) The Montreal Protocol on Substances that Deplete the Ozone Layer addresses a class of substances. Since 1987 the Protocol has sought to reverse past damage done to the Ozone Layer by supporting efforts to eliminate the consumption and production of ozone depleting substances. UNEP and UNDP help developing countries to implement the Protocol with the support from the Global Environment Facility (Appendix A).³

(d) The Rotterdam Convention on Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemicals and Pesticides in International Trade aims to provide prior notification of exports and imports of toxic and hazardous chemicals in global trade. The Convention covers pesticides and industrial chemicals that have been banned or severely restricted for health or environmental reasons. (Appendix A).⁴

(e) The Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal addresses environmentally sound management of chemical wastes and waste streams that involve 1000s of chemicals and considers life-cycle management of substances as these pertain to prevention, minimization and environmentally sound management of wastes. The Convention was principally devoted to setting up a framework for controlling the transboundary movements of hazardous wastes. It also developed the criteria for environmentally sound management and a control system based on prior written notification (Appendix A).⁵

² <http://www.ilo.org/public/english/protection/safework/cis/about/centres/allctrs.htm>

³ http://ozone.unep.org/Ratification_status/

⁴ <http://www.pic.int/home.php?type=t&id=63&sid=17>

⁵ <http://www.basel.int/ratif/ratif.html>

(f) The Stockholm Convention on Persistent Organic Pollutants emphasizes on life - cycle management for listed persistent organic pollutants. The Convention requires Parties to take measures to eliminate or reduce the release of POPs into the environment.⁶

(g) Globally Harmonized System of Classification and Labeling of Chemicals (GHS) addresses classification of chemicals by types of hazard and proposes harmonized hazard communication elements, including labels and safety data sheets. SAICM encourages the implementation of GHS in all countries and acknowledge its potential as a key tool to help achieve the World Summit on Sustainable Development (WSSD)'s 2020 goal of sound management of chemicals. Status of implementation can be found in Appendix A.⁷

(h) Integrated Pest Management (IPM) is a major strategy for reducing reliance on pesticides. FAO is assisting countries in Asia to establish IPM through participatory training programmes, establishing farmer field schools and training for trainers. Countries that have implemented the programme are Bangladesh, Cambodia, China, Indonesia, Lao PDR, Nepal, Philippines, Thailand, and Viet Nam.

(i) National Cleaner Production Centers (NCPCs), with the support of UNIDO and UNEP, are focusing on the entire production cycle that increases the natural resources productivity of manufactured products. The NCPCs aim to build national capacity that is adapted to local conditions. Globally, a total of forty-five centers have been established as of 09 January 2009, with 7 of the centers located in the AP region (Appendix A). Demonstration projects, training seminars and publishing guidance manuals are among their core activities.

3.1.2 International organizations in sound management of chemicals

27. Organizations contributing to chemical management include the international and regional communities, which play an important role in coordinating activities, transferring knowledge, and supporting project implementation. Additionally, there are country-based organizations, which are responsible for drawing national policy, and implementing the plans as well as providing information on

⁶ <http://chm.pops.int/Countries/StatusofRatification/tabid/252/language/en-US/Default.aspx>

⁷ http://www.unece.org/trans/danger/publi/ghs/implementation_e.html

risks identification and assessment. Some key players in chemical management are shortlisted in the following section.

(a) Food and Agriculture Organization (FAO): FAO deals mainly with the application of agricultural chemicals. Programmes implemented include the International Code of Conduct on the Distribution and Use of Pesticides, and Pesticide Management.

(b) International Labour Organization (ILO): The ILO assists countries in the AP region to strengthen national occupational safety and health (OSH) systems by developing occupational safety and health master plans (Cambodia), national occupational safety and health profiles (Mongolia), and national programmes on labour protection, occupational health, and occupational safety (Vietnam).

(c) Organisation for Economic Co-operation and Development (OECD): The OECD Environment, Health and Safety Programme includes the Chemicals Programme. The main areas of work include sharing of data on pesticides, biocides, chemical accidents; harmonization of regulatory oversight in biotechnology; and Pollutant Release and Transfer Registers (PRTRs).

(d) United Nations Development Programme (UNDP): UNDP is addressing issues related to chemicals management and chemically linked pollution in developing countries by encouraging integration of rigorous chemicals management schemes into Millennium Development Goals; MDG-based national development policies and plans (UNITAR, 2004).

(e) United Nations Environment Programme (UNEP): Several divisions and units of UNEP are involved in the management of chemicals and deliver related capacity-building. These include the Division of Technology, Industry and Economics (DTIE), which includes UNEP Chemicals, the Energy and Ozone Action Unit and the Production and Consumption Branch, the Division of Policy Development and Law, and the Division of Global Environment Facility Coordination (DGEF).

(f) United Nations Industrial Development Organization (UNIDO): UNIDO promotes sustainable industrial development in developing countries and countries in economic transition.

(g) United Nations Institute for Training and Research (UNITAR): UNITAR provides training to assist countries in meeting the challenges of the 21st century; conducts research to explore innovative training and capacity-building approaches; and forms partnerships with other UN agencies,

governments and non-governmental organisations for the development and implementation of training and capacity-building programmes (UNITAR, 2004).

(h) World Health Organization (WHO): Capacity-building activities of the WHO related to chemical safety are undertaken largely through the International Programme on Chemical Safety (IPCS) and through regional offices and country offices. One of the most significant projects in cooperation with the WHO is the harmonization project for risk assessment methodology across assessment sectors, i.e. industrial chemicals, biocides, pesticides, pharmaceuticals, occupational and public health.⁸

(i) World Bank: Capacity-building for chemicals management under the Bank takes place within larger projects and programs in related sectors; through analytical and advisory assistance; and via chemicals-based projects funded through trust funds, global partnerships and international environmental financial mechanisms. Recent cooperation in the AP region includes the Mindanao rural development programme (Philippines), sustainable rural livelihoods and security through innovations in land and ecosystem management (India), and a livestock waste management programme (Thailand).⁹

(j) Global Environment Facility (GEF): One of the six focal areas funded via GEF is POPs. GEF's involvement in tackling the threats posed by POPs started with an introduction of the International Waters Operational Strategy and its contaminant-based component followed by regional assessments and pilot demonstrations that addressed a number of pressing POPs-related issues. In the AP region, the major activities supported by the GEF are the preparation of the POPs National Implementation Plan under the Stockholm Convention.

(k) The Multilateral Fund (MLF) was established by a decision of the Parties to the Montreal Protocol and began its operation in 1991. The main objective is to assist developing country parties to the Montreal Protocol to reduce the consumption and production of ozone depleting substances (ODS). Projects approved through 2007 have already eliminated the consumption of nearly 258,574 ODP tonnes and the production of 195,013 ODP tonnes. National Ozone Units have been

⁸ <http://www.who.int/ipcs/methods/en/>

⁹ <http://web.worldbank.org/WBSITE/EXTERNAL/NEWS/0,,enableDHL:TRUE~menuPK:34471~pagePK:64001179~piPK:64255732~theSitePK:4607,00.html>

established in 143 developing countries, raising capacity on implementing environmental regulations. Virtually all Parties to the Protocol have been able to meet their phase-out targets.¹⁰

3.1.3 Capacity-building for developing countries and countries in transitions

28. Capacity development has gained importance due to the realization that for development to be effective, strengthening local institutions, rules of the games, and incentives is critical. This insight has led donors and recipient countries to shift the focus from project-based, short-term, technical fixes to programmatic approaches that emphasize country ownership and capacity. At present there are several capacity development programmes aiming at sound management of chemicals, including:

- ***Best Available Techniques and Best Environmental Practices (BAT/BEP)*** – An expert group was established by the Intergovernmental Negotiating Committee of the Stockholm Convention on Persistent Organic Pollutants - with a view to develop guidelines on best available techniques.¹¹
- ***Guidelines on Compliance with and Enforcement of Multilateral Environmental Agreements*** - UNEP Special Session of Governing Council recognized the importance of environment, compliance, enforcement and liability as well as capacity-building. Therefore, UNEP has adopted Guidelines on Compliance with and Enforcement of Multilateral Environmental Agreements (MEAs).
- ***National Chemical Management Profiles*** - Through its National Profile Support Programme, UNITAR provides guidance, training and technical support for sound chemicals management.
- ***Implementation of the GHS*** - This programme provides guidance documents, training materials, expert training and awareness-raising regarding the GHS. UNITAR/ILO are the designated focal point for capacity-building in the UN ECOSOC Subcommittee of Experts on the GHS (SCEGHS). UNITAR, along with ILO and OECD, also initiated at the WSSD the Global Partnership for Capacity Building to Implement the GHS.
- ***Design and Implementation of Pollutant Release and Transfer Registers*** - The PRTRs Training and Capacity-Building Programme assists countries in the design and implementation of

¹⁰ <http://www.multilateralfund.org/>

¹¹ http://www.pops.int/documents/meetings/cop_1/meetingdocs/en/cop1_8/COP_1_8e.pdf

national PRTR systems and is implemented in co-operation between UNITAR, OECD and UNEP Chemicals.

- **POPs monitoring capacity-building** - The need for relevant capacity strengthening for effective participation in the POPs global monitoring plan was carried out in terms of human capacity strengthening, improving QA/QC, and acquisition of analytical equipment.

- **Quick Start Programme** – Countries in the AP region have received support from the QSP trust fund, mainly to develop and update national chemical management profiles, develop national SAICM capacity assessment and organize workshops on national SAICM priority setting

3.2 Progress on sound management of chemicals in different countries

29. Sound management of chemicals can be achieved by incorporating five main work areas: 1) risk reduction where appropriate; 2) knowledge, information and public for decision-making; 3) governance; 4) capacity-building and technical assistance in relation to all aspects of the chemicals management; and 5) illegal international traffic in hazardous substances and dangerous products.

3.2.1 Measures to support risk reduction

30. Activities implemented in risk reduction programmes are broad; examples are shown below.

- Control banding (Ongoing) lead by WHO with the cooperation from IPCS, ILO, and UNITAR. The output of this activity is a development of an international technical group that meets regularly.

- Guidance on Pollutant release and transfer registers (PRTRs) lead by OECD with the cooperation from UNITAR, UNEP, IOMC, and UN/ECE. A resource center for searching Release Estimation Techniques was established in 2004.

- Implementation of the globally harmonized system for the classification and labeling of chemicals lead by WHO – International programme on Chemical Safety (IPCS) with the cooperation from WHO regional offices, INTOX participating Centers, Professional bodies, WSSD Global GHS partnership, ILO, UNITAR, and UNECE

- Prevention and disposal of obsolete pesticides carried out by FAO to develop technical guidance, inventories, awareness-raising, and support to countries in dealing with obsolete pesticides.

Training programmes on inventory and management of obsolete pesticides were conducted in various countries; e.g. China, India, and the Philippines

- Prevention of, preparedness for, and response to chemical accidents safety performance indicators lead by OECD with cooperation from IOMC, UN/ECE, UNEP/OCHA, industry, and EEB. The guidance on safety performance indicators was developed in 2003.

3.2.2 Strengthening knowledge and information

31. In order to strengthen knowledge and information, measures implemented include improved education, training and awareness-raising activities aimed at those who may be exposed to toxic substances. Examples of activities implemented, as well as the lead organization and expected output, are shown below.

- Assessment of the impact of chemicals (heavy metals; 2004 - 2005); lead by UNEP with the cooperation from IOMC. The activity developed and published an assessment report on effects of heavy metals on people and environment.

- Regional Monitoring and Analysis Projects in Asia (2008-2010); in order to respond to requests from developing countries in Asia, a regional project has been developed to strengthen their analytical capacity and to enable their contribution to the Global Monitoring Plan on POPs. A regional GEF project is being implemented in seven South-Pacific Island States.

- Database on use and releases of industrial chemicals (Ongoing): lead by OECD to develop a searchable database, including information on emission scenario documents and other information sources for estimating releases of industrial chemicals to the environment.

- Chemical Information Exchange Network (CIEN). To improve access and exchange of environmental information, the Chemicals Branch of the United Nations Environment Programme launched the CIEN project.

- SAICM Emerging Issues: The second session of the International Conference on Chemicals Management (ICCM2) addressed four emerging policy issues with a view to establishing co-operative actions. The issues are lead in paint, nanotechnologies and manufacture of nanomaterials, chemicals in

products, and hazardous substances. However, information for each issue is still insufficient and needs to be strengthened.

3.2.3 Governance: strengthening of institutions, law and policy

32. To promote good governance in chemicals management, countries are required to review national legislation in order to ratify and implement existing international agreements dealing with chemicals and hazardous wastes, such as the Basel Convention on the Control of the Transboundary Movement of Hazardous Wastes and their Disposal, the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, the Stockholm Convention on Persistent Organic Pollutants, and the International Labour Organization conventions on the protection of workers.

33. Emphasis has been given to measures to improve coordination and synergies with respect to chemical safety policy and activities at the national and international levels as well as the contribution from all stakeholders. New legislations that will allow for the sound management of chemicals are developed in countries that lack such legislation.

34. Other measures under the governance category are the development of systems for emergency preparedness and response in the case of chemical accidents; the consideration of chemical use in protected areas; training in liability and compensation schemes in relation to damage to human health and the environment caused by the production and use of chemicals; and action to prevent and detect illegal trafficking of chemicals and hazardous wastes.

3.2.4 Enhancing capacity-building

35. Capacity-building measures include training of personnel in order to provide the necessary skills to support the systematic implementation of the Strategic Approach at all levels in a coordinated way and across the full range of SMC. Strengthening national capabilities and capacities for managing chemicals is a major focus of the operations of all of the agencies. Capacity-building activities include:

- A UNITAR/UNEP/FAO joint training programme, on the operation of the PIC programme has been conducted in all regions of the world.

- UNEP has conducted extensive training in establishing national information systems for managing chemicals information.

- ILO is implementing an action programme in eight countries aimed at strengthening factory inspections on chemical safety issues and promoting national coordination in this area.

- FAO provides assistance on pesticide management in member countries through its Technical Cooperation Programme.

- UNIDO, in cooperation with UNEP, has set up cleaner production centres in 12 different countries.

- IPCS approach to training programmes for trainees in the safe use of pesticides and poison control has led to multiplier effects in a number of countries.

- UNEP, with the financial support from GEF and donor countries, carried out a project to assess capacity-building needs to analyse POPs in a sound and sustainable manner. Countries in the AP region involved in this project were China, Fiji, and Vietnam.

- SAICM Quick Start Programme. Most projects are for the purpose of capacity-building. Listed here are a few examples of projects approved. 1.) Capacity-Building for Integrated and Sustainable Chemicals and Hazardous Waste Management (Bahrain), 2.) Protecting human health and the environment from mercury in artisanal and small-scale gold mining (ASGM) in Asia (Cambodia, Philippines), and 3.) Establishing an institutional framework and strengthening national capacity for sound chemicals management and implementation of the Strategic Approach (Palau, Samoa).

- The UNDP-UNEP Partnership Initiative for the Integration of Sound Management of Chemicals (SMC) into Development Planning Processes was initiated to facilitate integration of the SMC into national development planning as part of the poverty-environment linkage.

- The UNEP-KEMI Project on Development of Legal and Institutional Infrastructures for the Sound Management of Chemicals in Developing Countries and Countries with Economies in Transition, jointly developed by UNEP and the Swedish Chemicals Agency (KEMI), aims at assisting developing countries and countries with economies in transition in the development of national legal, technical and institutional infrastructures needed for effectively implementing SMC.

36. Apart from training programmes, capacity-building and technical cooperation can be implemented. The most important activities are to prepare national profiles, priority setting and

information exchange for sound chemicals management. Here, countries assess their existing legal, institutional, administrative and technical structures for sound chemicals management, set priorities and develop websites. After the national profiles have been developed, countries can further develop national plans for implementation.

3.2.5 Addressing illegal international traffic

37. Actions at the national, regional and global levels are needed to prevent and detect illegal trafficking of chemicals and hazardous wastes. Initiatives here include the ratifying of relevant Multi-lateral Environmental Agreements such the Montreal Protocol, the Basel, Rotterdam and Stockholm Conventions. As many developing countries do not have the financial capacity to control illegal traffic, UNDP and UNEP have started the Partnership Initiative for the Integration of Sound Management of Chemicals Considerations into Development Planning Processes.

38. Concerning ozone depleting substances, the Project Sky Hole Patching has established a monitoring and notification system among member administrations to keep track of the movement of suspicious shipments of ozone-depleting substances and hazardous waste which are imported, re-exported or trans-shipped across international borders. An initiative for regional cooperation was recently launched by OzonAction in collaboration with the Swedish International Development Agency (Sida) and the UNEP Regional Office for The Asia-Pacific¹².

3.2.6 Improved general practices

(a) Operational Activities

39. From the beginning of chemicals management initiatives, efforts were put into the use of control technologies applied at the “end of the pipe” to minimize the amount of hazardous substances released to the environment. However, focus has shifted towards more cost-effective ways to minimize the amount of substance that reaches the end of the pipe. But the identification of best practical operation in chemicals management is complex, considering that it involves different aspects of chemical testing, assessment, and management throughout the life cycle of chemicals. The operational activities are designed to protect human health, avoid pollution of ecosystems and often have additional

¹² <http://www.unep.org/gc/gccs-x/download.asp?ID=508>

objectives such as reducing burdens on governments, avoiding trade distortions, and facilitating economic development. Outputs of these activities are varied and target multi-stakeholder audiences. Outputs include legally binding agreements, voluntary agreements, development of technical materials and policy guidance, and various types of mechanisms for improving access to information, sharing of experience, education and training.

(b) Policy development and implementation

40. At present attention has been given more to policies that prevent rather than control pollution, which can be done through a number of ways, including in-process recycling, process controls, inventory controls, housekeeping changes, and sustainable chemistry. Chemical legislation needs to be strengthened in all countries, particularly in industrializing countries. To increase effectiveness, legal and other instruments developed under the support of the UN system need to be more widely ratified and/or implemented at the national level. Wider implementation is particularly important for risk management/reduction initiatives.

(c) Community-based programmes

41. Over the last ten years, focus has increased on public participation in decision making. The public must be provided with comprehensive and understandable information about the state of their environment. Many countries have incorporated the principle of community and worker rights to know into their national environmental programmes. Industry has also responded by developing mechanisms for education and outreach in the communities where they operate through, among other things, community advisory panels. Stakeholders in chemical safety issues are likely to include government departments, business, organized labour and workers, environmental groups and other non-governmental organizations (OECD, 2002).

42. Examples of a community-based programme can be found from the work implemented by the Asian Urban Disaster Mitigation Program (AUDMP), which is designed to respond to the need for safer cities in Asia. A list of pilot projects and types of disaster in countries is shown online.¹³

¹³ <http://www.adpc.net/AUDMP/aboutaudmp.html#target>

(d) Corporate Social Responsibility

43. There are work areas concerning the improvement of general chemicals management practices, such as the development and implementation of cleaner production methods in accordance with best available techniques and best environmental practices. Measures associated with improved corporate social and environmental responsibility for the safe production and use of products include the further development and implementation of voluntary programmes.

3.3 Implications for the countries/subregions that are being left behind

44. **National chemical policy:** To ensure that risk generated from mismanagement of chemicals will be considered as national and local priorities with sufficient institutional support, policies on local chemical management need to be prepared in those countries in economic transition. Lessons learnt from developed countries can be useful for those countries to develop their own policy appropriate for their localities.

45. **Enhancing capacity-building:** Most problems in developing countries stem from inappropriate distribution of knowledge and low capacity of human resources. Impacts from mismanagement of chemicals can be vital; therefore, it is important for local personnel to understand impacts of chemicals and assessment methodologies.

46. **Infrastructure development:** National governments and other multilateral agencies should establish strong cooperation to support the preparation of required infrastructures; laws and regulations, research facilities, and databases, for instance. Such infrastructure helps in creating reliability of the information, aids informed decision making.

3.4 Assessment of chemical risk posed on climate change

47. When discussing the link between SMC and climate change issues, several important points can be drawn; CO₂ emissions from the chemical industry, replacement of ozone depleting substances by powerful greenhouse gases, impacts of climate change such as floods and severe storms that cause industrial accidents and subsequent chemical releases, and the use patterns for chemicals that gradually change with climate.

48. The chemicals industry is energy intensive and accounted for some 7% of total world energy

use in 1998 (IEA, 2000a). Global trend data on total CO₂ emissions from the chemicals industry are not readily available. However, the chemicals industry has been expanding rapidly in this region and has increased its reliance on coal; therefore, emission of CO₂ could be cause for concern. Coal produces more CO₂ on a per unit energy basis than oil or gas (IPCC, 1996).

49. The OECD Reference Scenario projects that CO₂ emissions from the chemicals industry in OECD countries will increase by 66% from 1995 to 2020, while the increase in non-OECD countries, including most countries in the Asia-Pacific region, will be 165% during the same period. However, if greater energy efficiency gains are achieved in the chemicals industry, CO₂ emissions may increase at slower rates. Future trends in CO₂ emissions will also depend highly on the commitments made by government and industry to comply with climate agreements.

3.5 Obstacles and Constraints in Implementation

50. Many countries lack the capacity to manage chemicals soundly. There are inadequate resources available to address chemical safety issues to bridge the widening gap between developed countries, on the one hand, and developing countries and countries with economies in transition on the other.

51. Countries in economic transition often lack adequate capacity to identify and analyze chemical management issues of concern within their jurisdictions. Even when the country has an adequate understanding of its chemical management issues, a relatively new set of skills, experts and institutional participants are required to analyze the linkages between chemical management issues and the development priorities of the country. As the chemical industry continues to evolve, new chemicals are being developed and risk information on such chemicals is normally not available, or available with limited access to such information.

52. The existing international policy framework for chemicals is not completely sufficient and needs to be further strengthened. In addition, the implementation of established international policies is uneven in the region and therefore slows down the process of development. Implementation in Pacific Island Countries and Territories has been slow compared to other subregions. Less developed countries, also face difficulties in implementation due to the lack of infrastructure required.

4. Policy Options

53. Over the past few decades, policies have been designed to protect the well being of humans and the environment from the hazardous emissions released during the production of chemicals; the risks posed by consumption of chemicals contained in consumer products; and the risks caused by inappropriate handling of chemical wastes. Most governments have used a mixture of policy instruments (*i.e.* regulatory, economic and voluntary) to work toward the objective of ensuring the chemicals industry and the chemicals it makes are safe for man and the environment.

4.1 Policy and countermeasures for future management of chemicals

54. Three broad categories of environmental policy instruments have evolved and all are being applied, in one form or another: Regulatory instruments (e.g. pre-market approval, emission standards, labeling, product bans); Economic instruments (e.g. taxes, tradable permits, refund systems); and Voluntary instruments (e.g. voluntary codes such as Responsible Care, ecolabeling schemes). All forms of policy instruments in SMC are incorporated into the SAICM.

55. The development process of SAICM was multi-sectoral and multi-stakeholder in nature, involving representatives of governments, non-governmental organisations (NGOs) and intergovernmental organizations (IGOs) drawn from sectors such as agriculture, environment, health, industry, and labour. UNEP, the Inter-Organization Programme for the Sound Management of Chemicals (IOMC), and the Intergovernmental Forum on Chemical Safety (IFCS) were co-conveyors of the process.

56. In 2006, the International Conference on Chemicals Management (ICCM) adopted the SAICM at its first session. The main outcomes of the SAICM process are three key documents:

1. Dubai Declaration on International Chemicals Management

57. Held during 4 – 6 February, 2006, the Dubai Declaration was formulated at the Dubai International Conference on Chemical Managements to Improve the Living Environment organized by the Dubai Municipality in association with the United Nations (UNCHS/HABITAT). It was declared that the sound management of chemicals is essential if we are to achieve sustainable development, including the eradication of poverty and disease, the improvement of human health and the environment and the elevation and maintenance of the standard of living in countries.

2. Overarching Policy Strategy (OPS)

58. The OPS provides information on the scope of SAICM, identifies needs for effective SAICM implementation, and outlines objectives, principles, and financial and implementation arrangements. The five categories of SAICM objectives found in the OPS are: Risk reduction; Knowledge and information; Governance; Capacity-building and technical cooperation; and Illegal international traffic.

3. The Global Plan of Action (GPA)

59. The GPA is a more detailed document that outlines proposed work areas, activities, actors, timeframes, targets, and indicators of progress related to SAICM implementation. The GPA contains 36 work areas, and 273 activities, structured in accordance with the five categories of SAICM objectives set out in the OPS. It is recommended for use and further development as a working tool and guidance document for stakeholders implementing SAICM.

4. Cooperation between existing instruments and processes

60. As SMC has a cross-sectoral and multi-stakeholder nature, it is important to recognize the need for synergies between existing instruments and processes to bridge the gap of information and to reduce the overlapping work between agencies. All types of instruments; regulatory, economic and voluntary instruments, at all levels; international, regional, local, and community levels, are encouraged to cooperate with each other for fruitful results of implementation.

4.2 Institutional reform for chemical risks (technology, infrastructure)

4.2.1 Infrastructure reform

61. Chemical management policies for countries can be grouped into three main categories; 1) countries with basic laws in place governing pesticides, industrial chemicals, import, export, transportation, storage, etc., 2) countries that have laws that are not as complete with some legislation on consumer protection, and 3) countries with comprehensive legislation in place governing primary and secondary type laws. There is an urgent need to increase international efforts to assist countries in the development and enforcement of legislation to control the illegal movement of toxic chemicals.

4.2.2 Technology for chemical risk assessment

62. Developing countries in the region also lack the capability to respond effectively to serious accidents or to monitor long-term environmental effects. Consequently, policies favouring prevention rather than expensive clean-up should be preferred. Appropriate technology standards should be developed with regard to investments. For example, timely information exchange currently requires modern information technology, which, although costly, is efficient and, especially in emergency situations, can save many lives.

4.3 Conclusion for the way forward

63. Consumption and production of chemicals in the Asia-Pacific region will continue to grow to ensure smooth economic development, and improve human welfare and environmental health. Thus, a sound management of chemicals should be employed in order to avoid adverse impacts of mismanagement of chemicals on human society and ecosystems. Countries in the Asia-Pacific region are facing the same challenges as countries around the world. However, as the region consists of both developed and developing countries, it is also important to make sure that SMC has been integrated into poverty reduction strategies of developing countries. Developed countries in the region may also assist developing countries and countries with economies in transition in the form of capacity-building initiatives. Capacity-building for such countries may well include development in human resources as well as scientific and technical resources. For all countries within the region, corporate environmental and social responsibility along the supply chain of all business sectors should be promoted. Governments should be prepared with sufficient policy measures to support SMC at all levels. Economic instruments and voluntary-based instruments may be used to promote SMC and enhance participation of stakeholders in chemical management related matters.

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Appendix A: Status of Ratification to Selected Multilateral Agreements and Implementation of Sound Management of Chemicals Initiatives

Country	Basel Convention	Rotterdam Convention	Stockholm Convention	NIPs	CWC	Kyoto Protocol	Montreal Protocol	FAO Code	NCPCs	GHS	CIS National/ Collaborating Centre	WHO/PC
Afghanistan					r		r	A				
Armenia	a	r	r	i	r	r	r	A				
Australia	a	r	r	i	r	r	r	A		i	E	E
Azerbaijan	a		a	p	r	r	r	A				
Bangladesh	a		r	i	r	r	r	A			E	E
Bhutan	a				r	r	r	A			E	
Brunei Darussalam	a		-		r		r			i		
Cambodia	a		r	i	r	r	r	A	E	i		E
China	r	r	r	i	r	r	r	A	E	i	E	E
Cook Islands	a	a	a	p	r		r	A				
Cyprus	r	r	a	i	r	r	r	A		i		
Democratic People's Republic of Korea	a	a	a	i		r	r	A				
Fiji			r	i	r	r	r	A			E	
French Polynesia												
Georgia	a	a	r	p	r	r	r	A			E	
Guam												
India	r	a	r	p	r	r	r	A	E		E	E
Indonesia	a		r	p	r	r	r	A		i	E	E
Iran	a		r	i	r	r	r	A			E	E
Japan	a	A	a	i	r	r	r	A		i	E	E
Kazakhstan	a	a	r	p	r	-	r	A			E	E
Kiribati	a		r	p	a	r	r	A				
Kyrgyzstan	a	r	r	i	r	r	r	A				
Lao People's Democratic Republic			r	p	r	r	r	A	E	i	E	
Malaysia	a	a	-		r	r	r	A		i	E	E
Maldives	a	a	a	p	r	r	r	A				
Marshall Islands	a	a	a	i	r	r	r	A				
Micronesia			r	p	r		r	A				
Mongolia	a	r	r	i	r	r	r	A			E	
Myanmar			a	p		r	r	A		i		
Nauru	a		r	p	r	r	r	A				
Nepal	a	a	r	i	r	r	r	A			E	E

New Caledonia												
New Zealand	r	r	r	i	r	r	r	A		i	E	E
Niue			r	i	a	r	r	A				
Northern Mariana Islands												
Pakistan	a	r	r	p	r	r	r	A			E	E
Palau			r		a	r	r	A				
Papua New Guinea	a		r	p	r	r	r	A			E	
Philippines	r	r	r	i	r	r	r	A		i	E	E
Pitcairn Islands												
Republic of Korea	a	r	r	i	r	r	r	A	E	i	E	
Russian Federation	r		-		r	r	r	A		i	E	
Samoa	a	a	r	i	r	r	r	A				
Singapore	a	a	r	i	r	r	r			i	E	E
Solomon Islands			a	p	a	r	r	A				
Sri Lanka	a	a	r	i	r	r	r	A	E		E	E
Tajikistan		-	r	i	r	r	r	A				
Thailand	r	a	r	i	r	r	r	A		i	E	E
Tokelau												
Tonga			r	p	a	r	r	A				
Turkmenistan	a				r	r	r	A				
Tuvalu			a	i	a	r	r	A				
Uzbekistan	a				r	r	r	A				
Vanuatu			r	p	a	r	r	A				
Vietnam	a	a	r	i	r	r	r	A	E	i	E	E
Wallis and Futuna												

Remarks: NIPs National Implementation Plans
CWC The Chemical Weapons Convention
FAO Code International Code of Conduct on the Distribution and Use of Pesticides
NCPCs National Cleaner Production Centers
GHS Globally Harmonized System of Classification and Labelling of Chemicals
CIS International Occupational Safety and Health Information Centre, ILO
WHO/PC World Health Organization/ Poison Center

Status: (a) Accession
(A) Acceptance
(E) Established
(i) Implementation
(p) In Progress
(r) Ratified