Technical Assistance Consultant's Report

Hazardous Waste Policy Study for Nepal
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Managing Hazardous Wastes
(Financed by the Asian Development Bank Technical Assistance Funding Program)

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For the Asian Development Bank

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Asian Development Bank

Final Report

on

Hazardous Waste Policy Study

(Nepal)

Submitted to

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ABBREVIATIONS

%	-	Percent
^{0}C	-	Degree Celseus
3R	-	Three R – Reduce, Reuse and Recycle
ADB	-	Asian Development Bank
APO	-	Asian Productivity Organization
CA	-	Constitutional Assembly
CBS	-	Central Bureau of Statistics
CNI	-	Confederation of Nepalese Industries
CP	-	Cleaner Production
Cu. m.	-	Cubic Meter
DOHS	-	Department of Health Services
EIA	-	Environmental Impact Assessment
EMS	-	Environmental Management System
EPA	-	Environmental Protection Act
EPR	-	Environmental Protection Regulation
ESM	-	Environmental Standards and Monitoring
FNCCI	-	Federation of Nepalese Chambers of Commerce and Industry
FNCSI	-	Federation of Nepalese Cottage and Small Industries
GDP	-	Gross Domestic Product
GON	-	Government of Nepal
GP	-	Green Productivity
HCRW	-	Health Care Risk Waste
HMG	-	His Majesty's Government (Previous Government)
HW	-	Hazardous Waste
HWM	-	Hazardous Waste Management
IEE	-	Initial Environmental Examination
IOE	-	Institute of Engineering
KMC	-	Kathmandu Metropolitan City
M/T	-	Metric Tonne
MOAC	-	Ministry of Agriculture and Cooperatives
MOEST	-	Ministry of Environment, Science and Technology
MOF	-	Ministry of Finance

MOFSC	-	Ministry of Forest and Soil Conservation
MOHP	-	Ministry of Health and Population
MOI	-	Ministry of Industry
MOICS	-	Ministry of Industry, Commerce and Supplies (Previous)
MOLD	-	Ministry of Local Development
MOLTM	-	Ministry of Labour and Transport Management
MOPPW	-	Ministry of Physical Planning and Works
MOTCA	-	Ministry of Tourism and Civil Aviation
MSW	-	Municipal Solid Waste
NEPAP	-	Nepal Environmental Policy and Action Plan
NGOs	-	Non-Governmental Organizations
NHRC	-	National Health Research Council
NPC	-	National Planning Commission
NPR	-	Nepalese Rupees (Nepalese Currency)
PCC	-	Pollution Control Certificate
RETA	-	Regional Technical Assistance
SWMRMC	-	Solid Waste Management and Resource Mobilization Center
TOR	-	Terms of Reference
TU	-	Tribhuvan University
UN	-	United Nations
UNEP	-	United Nations Environment Programme
US $	-	United States Dollar
VDC	-	Village Development Committee

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1. Background

The Regional Technical Assistance (RETA) on managing hazardous wastes was approved in 2006 and supported by the Asian Development Bank (ADB). The main objectives of RETA include assistance to the governments of Bangladesh, Bhutan and Nepal to prepare inventories of hazardous wastes; drafting of policies, rules and technical guidelines to manage hazardous wastes; assistance to Government of India to review the current hazardous waste regulations and exploring potential involvement of private sector in managing hazardous wastes.

In Nepal, Ministry of Environment, Science and Technology (MOEST) is the implementing agency for this project. Preparation of inventory of Hazardous Waste (HW) has been completed. Formulation of the guidelines will be started soon. ADB has also hired the services of a national consultant for the formulation of the Draft Policy on Hazardous Waste Management (HWM). This report is the initial report for the study for the formulation of the draft policy.

2. Objective

The objective of the study is to assist the Government of Nepal to formulate draft policy and develop policy consultation methodology in the context of existing and proposed legislation and draft rules and guidelines for the management of hazardous wastes in the country.

3. Scope of Work

The scope of work as per the terms of reference specified to the policy consultant is as given below:

a. Examine and assess the environmental policy (framework) issues and existing institutional arrangements for HWM in the country and the potential impacts of introducing HWM policy both country wide and within a regional context (taking into account economic developments / exports and imports trade priorities including recycling and reuse trade some of which may include HW).
b. Prepare draft policy consultation methodology and assist in consultation with stakeholders in the process of formulating the draft policy.
c. Formulate a draft policy and institutional framework for implementing HWM policy based on local situations and guided by established international principles and

practices, and taking into account the implications under different future scenarios.

d. Identify training and capacity building needs for implementing the HWM policy.

4. Detailed Tasks

The detailed tasks to be carried out under the assignment are as follows:

Coverage

The issues to be covered in the policy study are based on the outcome of earlier inventory study and guidelines and any other continuing policy dialogues. A number of direct and indirect implications (may) have been identified as a potential result of the introduction of HWM and other medium and long-term developments in the industrial, health and transport sectors. The key to the study will include review of the relationships of the key areas of concerns, and the approach to an integrated suite of recommendations to be explored.

The problems and issues will differ with the geographic area and time perspective. The policy study should be flexible and realistic in determining the level of detail for the draft policies and geographic or HW sector focus required to cover important issues. The areas of concerns may also vary or be updated during the study and thru (several) rounds of policy consultations.

In assessing and reporting the policy framework a structure for different geographic zones and/or HW sectors may be proposed. The definition of the approach to the policy study will be presented in the (first) initial report of the policy study.

Preparation of Policy Scenarios

The analytical baseline for the policy study is broadly covered by the following:

- Draft Inventory resulting from Stage 1 of the RETA
- Draft guidelines resulting from Stage 1 of the RETA
- Other policy initiatives and development proposals for urban development, health care, industry, mining, social development, other sectors as deemed relevant

The relevant development plans and trends for the above-mentioned sectors and other interventions in the fields of HWM, 3Rs, cleaner production, solid waste management, and disposal of wastewater will be reviewed and taken into account in preparing the draft policy.

A set of policy recommendations (framework) will be formulated on actions and interventions to modify or avoid potential negative impacts and control HWM. A summary of the assumed impacts, provided that the proposed recommendations for HWM are implemented, will be presented. The policy assessment will also constitute a scenario, which reflects the "best practice" with broad policy support for environmentally and socially sensitive development.

Institutional and capacity building issues affect most sectors of the RETA and HWM. Issues are specifically related to management, training and capacity for different sectors, there are a number of common concerns and challenges. These issues will be covered as far as reasonably practicable within the broader context of policy formulation and the various scenarios and responsibilities for managing hazardous waste, treatment of the impacts, and furthermore, be included as the proposals for / recommendations for HWM are rolled out. The training to be available / provided by India shall also be reviewed in this context.

5. Outputs / Reporting Requirements

The outputs specified under the consulting services consist of:

- Draft policy for HWM
- Draft institutional framework to implement the policy
- Draft consultation methodology
- Draft proposal for training and capacity building based on the institutional framework

6. Methodology Used

Policy formulation procedure has to be an interactive and it has to go through adequate consultation process to involve and obtain inputs from all the stakeholders. Proper involvement and consultation can only solicit ownership of the policy and help in the effective implementation of the formulated policies.

The methodology followed in the preparation of the document and process of consultation is presented below:

- Interaction with the government authorities and private sectors
- Preparation of a work plan
- Formation of a Steering Committee of important stakeholders for reviewing the prepared documents and providing feedback and comments
- Preparation of a list of stakeholders for consultation and obtain inputs on the prepared documents specifically in an interactive workshop
- Preparation of a consultation methodology and obtaining the approval of the prepared consultation methodology from the steering committee
- Literature study for the formulation of the draft policy, institutional setup and training and capacity building need
- Preparation of the draft documents suitable in context of Nepal
- Initiating the consultation process to get feedback and inputs on the prepared documents using the approved consultation process, which consists of series of steering committee meetings and an interaction workshop with wider stakeholder participation
- Revising the documents by incorporating the relevant comments, inputs and suggestions during the process of consultation
- Preparation of the report along with the final draft documents and submitting to the Ministry of Environment, Science and Technology (MOEST) and the Asian Development Bank (ADB).

7. Evolution of HWM and International Practices

All countries; small or large, developed or developing, generate Hazardous Wastes (HW). Even countries with low manufacturing base generate HW from the import of products that ultimately turns into hazardous wastes. Oils from transportation, redundant pesticides from agriculture, chemical wastes from industrial and commercial units, acids and lead from batteries; acids, alkalis and organic solutions from industrial cleaning; and healthcare wastes are some of the examples of hazardous waste. Even small scale or cottage industries such as tanneries, print shops, textile dyeing, and electroplating workshops generate significant amount of hazardous waste.

More and more chemicals find use everyday. More than 50,000 of them with one million combinations are being used in agriculture, industry and in households. Some of these are highly toxic and dangerous. Hazardous Wastes (HW) are generated from wide range of industrial, commercial, agricultural and even domestic activities. It may be in the form of solid, liquid or gaseous materials.

HW causes immediate, short term public health and long term environmental pollution. They can affect the whole life and food cycles and hence pose danger to human health and ecological system. Therefore, it is necessary to have proper disposal and storage methods to eliminate contamination. Proper management of HW is costly. But cleaning up is much more expensive ranging from 10 to 100 times the cost of treatment and proper disposal.

Developed countries have produced and used these chemicals and hazardous materials. Once these materials are discarded as waste, management of such waste are not easy to handle. There are evidences of some countries illegally exporting and disposing such wastes to developing countries without their knowledge[1].

Developed countries have now given top priorities to manage HW in an integrated manner and established hazardous wastes management systems. In the beginning, developed countries also practiced reactive approach also referred to as 'technical fix'.

[1] In December 1998 media had covered news on the dumping of mercury laden sludge by Taiwan in Cambodia. (APO, 2001 *Hazardous Waste Management Policies and Practices in Asian Countries*, Asian Productivity Organization, Tokyo)

Introduction of HWM has been just over 3 decades. They had some of the features in common; these included regulatory controls introduced in stages, gradual facility development, and development of administration and information system. However, today the approach is more broad-based that includes social and economic measures to influence the change in behavior.

Waste minimization measures such as Cleaner Production (CP), 3R principles and Green Productivity (GP) are promoted and practiced before treatment and disposal of such wastes in an environmentally sound manner. These measures also save on valuable resources. These measures have contributed in the minimization of HW generation in terms of generated quantity and also in terms of the severity of hazardous effects that they produce. Developed countries have achieved this through clearly defined legislations, assigning of responsibilities of all concerned stakeholders, training and education; and construction and operation of proper disposal facilities. They have also classified the HW in practical terms and used technical as well as administrative standards so that monitoring and compliance with the standards are practiced.

For the storage and transportation of hazardous waste, appropriate containers and labeling systems for identifying the type of hazardous materials have been developed and practiced[2].

In 1989, Basel Convention on the control of trans-boundary movements of Hazardous Waste and their disposal was adopted. This convention came into force in 1992. Presently (by 3 November 2008), there have been 170 parties to this convention. The key objectives of this convention are:

- To minimise quantity and hazard of wastes generated
- To ensure environmentally sound management and adequate disposal facilities
- To dispose of wastes as close as possible to their point of generation
- To reduce trans-boundary movements
- To prohibit exports from developed to developing countries
- To provide support to Member States

[2] UN Hazard labels and placards is given in the Appendix – I page 75

The lessons learnt from the implementation of HWM in the developed countries can be listed as given below:

- Hazardous waste management controls must be introduced in stages
- Legislative and enforcement measures must be developed in parallel with establishment of facilities and support services
- As controls on emissions to air, land and water are gradually tightened, areas of pollution can be identified and addressed
- Public communication should begin at the outset
- Waste minimisation should be addressed at an early stage - waste minimisation reduces the size (and hence cost) of treatment facilities needed

8. Policy Issues

Overall objectives of the HWM must be to carry out in parallel all the following national strategies:

- Build capacity to deal with hazardous wastes
- Bring locally-generated hazardous waste under control
- Control multi-national corporations
- Implement the Basel Convention (control import and export)

The first step should be to identify all the stakeholders involved in the management of wastes. These in general include:

- Government policy makers & regulators: environmental and waste policy, regulation of industry
- Waste generators: manufacturing companies, utilities, service sector, individuals
- Waste industry: contractors, consultants, trade associations & professional bodies
- Transport sector including waste transporters
- Consultants conducting EIA and plant permitting processes
- Universities and training bodies e.g. CP & Basel Centres
- Technology providers
- International agencies & programmes
- Media
- Public groups

- NGOs
- Product development professionals: designers, marketing & advertising
- Purchasing groups and individuals (including consumers)

National control system for HW must include development of all the four elements of the control system namely the legislation, enforcement, facilities and support services. Under the legislation, act will have framework provision and rules, standards, guidelines and code of practices will have to be developed for these provisions. Legislation will not produce any desirable result if there is no enforcement mechanism. Therefore, it must be ensured that the enacted legislations are practically enforceable. Waste generators will need to use facilities for recycling, treatment and environmentally sound disposal. Only use of these facilities will ensure compliance. Support services such as laboratory facilities, monitoring, data processing and emergency response, are needed to support the whole system of control system.

The policy must encourage the stakeholders to motivate to follow the waste management hierarchy from dump – controlled disposal - treat and process – recycle & reuse – reduce or minimize – avoid or prevent. For this a blend of command and control measures, economic instruments, voluntary approaches and information dissemination and use is utilized effectively. The HW waste generator may shift its responsibility to the transporters, recycling units, storage facilities, treatment plants and disposal facilities. Therefore, policy must also influence all of these elements. For the control system to be effective and efficient infrastructure and support services such as Analytical services, Consultancy services, Training and skills development, and Information systems will be required.

For a developing country, policy formulation only after all the detail studies and investigations will not be practicable. It will be too late to carry out such an approach. Therefore, the guiding principles should be to do something right now with the use of secondary date and quick estimations. Initial funding will be necessary to start for training staffs and for waste minimization. Carrot and stick approach will be effective and communication with major stakeholders is essential.

The following principles will need to be prioritized and followed accordingly:

- The Source Reduction Principle

- The Integrated Life-cycle Principle
- The Precautionary Principle
- The Integrated Pollution Control Principle
- The Standardization Principle
- The Self-sufficiency Principle
- The Proximity Principle
- The Least Trans-boundary Movement Principle
- The Polluter Pays Principle
- The Principle of Sovereignty
- The Principle of Public Participation

9. Nepalese Context

9.1 Geography and Population[3]

Nepal is a beautiful land-locked country between the Tibetian Autonomous Region of the Peoples Republic of China separated by snow-capped Himalayas in the north and India on all other three sides. Nepal is roughly rectangular in shape and covers an area of 147,181 square kilometers. The country lies between the latitudes 26^{o} 22' North and 30^{o} 27' North and between the longitudes 80^{o} 4' and 88^{o}12'. The average distance east west is around 885 kilometers, while the north south width varies from 145 to 241 kilometers.

Nepal has great variety of topography as the altitude varies from 70 meters to the top of the Everest at 8,848 meters. The country is divided into three geographical regions namely the Himalayas in the north with the altitudes from 2,500 meters to 8,848 meters; mountains in the middle region; and plain of Terai in the south. Besides the Everest, many world famous majestic peaks are located in Nepal with eternal snow. The Himalayan and the Mountain regions comprise 83 percent of the total area leaving 17 percent flat land of Terai in the south. Several rivers and tributaries flow towards south originating from the glaciers and snow-fed lakes. Mahakali, Seti, Karnali, Gandaki, Koshi and Mechi are the major rivers.

[3] Based on CBS, 2007 *Nepal in Figures*

Nepal has distinct four seasons: spring from March to May; summer from June to August; autumn from September to November; and winter from December to February. Spring and autumn seasons are pleasant. The Terai is hot and humid with temperature going up to 40^{o}C. The mountains region is pleasant round the year and the Himalayan region has an alpine climate. Maximum temperature of the capital city of Kathmandu is around 20^{o}C in winter and around 32^{o}C in summer. Nepal receives most of its rains during the months of June, July and August.

The population of Nepal as per the census of 2001 was 23.15 million. It is estimated to grow at 2.25 percent per annum and the projected estimate for the year 2007 is 26.4 million with male 13,240233 and female at 13,187,166. Nepal has many different ethnic, castes, linguistic, and religious communities speaking different languages and practicing different cultures. 13.9 percent of the population lives in the urban area. The literacy rate is 54.1 percent; 65.5 percent for male and 42.8 percent for female. 31.8 percent of the population live below poverty line. There are many indigenous ethnic (Janajaties) and caste (Dalits) groups who have been historically disadvantaged, and who continue to lag behind human development indicators.

9.2 Government & Administrative System

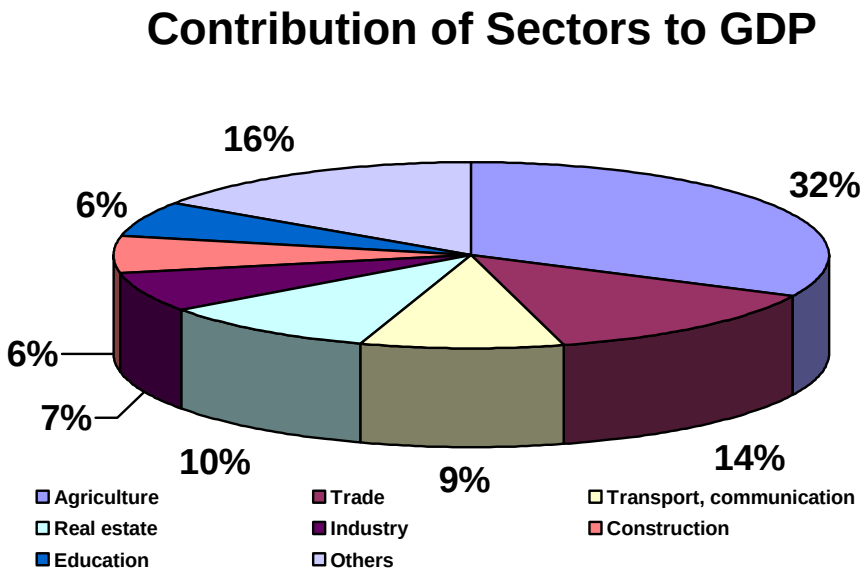
The country is divided administratively into five development regions, fourteen zones, seventy-five districts, fifty-eight municipalities and 3,915 villages. Nepal had been ruled for centuries by Kings as a Hindu Kingdom. Democratic movement of 1990 turned the country as a Multi Party Democracy with Constitutional Monarchy. April 2006 saw again huge people's movement for democracy and the country has been declared a republic throwing the monarchy out. Constitutional Assembly election has been completed in April 2008 bringing revolting Nepal Communist Party (Maoist) to power in a collaborative government with Nepal Communist Party (United Marxist and Leninists) and Madhesi Janaadhikar Forum. New constitution is to be written with the involvement of the elected constitutional assembly members by June 2010.

9.3 National Economy

Nepal is predominantly an agricultural country. Agriculture contributes around 32 percent to GDP. The growth rate of GDP in the fiscal year 2007-08 has been estimated at 4.7 percent (at producer's price) as against 3.19 percent in the previous year. The growth rate of agriculture and non-agriculture GDP have been estimated at 5.65 percent and 5.57 percent as against the figures of 0.94 and 4.10 percent in the previous fiscal year.

The following pie charts show the variation in the contribution from different sectors to GDP and in 2007/08[4]. The GDP at base price has been estimated at NPR 1,264.8 Billion.

The analysis of the contribution of the major sectors shows that the share of agricultural remains 32.12 percent; wholesale and retail trade 13.60 percent; transport, storage and communication 9.3 percent; real estate, renting and business services 9.91 percent; industry 7.06 percent; construction 6.44 percent, education 5.99 percent, others 15.61 percent.



According to the Central Bureau of Statistics, GDP per capita at current price in 2007/08 is estimated at NPR 30,361. The previous year, GDP per capita was NPR 27,497. In US Dollar terms, per capita GDP at current price is estimated at US$ 470 compared to US$ 390 a year ago.

[4] MOF, 2008 *Economic Survey 2007/08*, Ministry of Finance, Government of Nepal

Gross domestic product by sector (% of total)

Sector	1999/00	2007/08
Agriculture, forestry and fisheries	39.6	32.6
Mining and quarrying	0.5	0.5
Manufacturing	9.2	7.06
Electricity, gas and water	1.6	1.96
Construction	10.2	6.44
Trade, restaurants and hotels	11.7	15.04
Transport, communications and	8.0	9.3
Finance and real estate	10.1	14.67
Community and social services	9.1	12.43
Total	100	100

9.4 Review of Related Policy and Legislations

Hazardous Wastes (HW) has not been given its due importance in Nepal. There has been no policy, legislation, standards for HW as such. The existing scenario with regards to HW in the country can be understood from the provisions made in the various documents as presented below:

9.4.1 Interim Constitution of Nepal[5]

Nepal is in the state of drafting the constitution of the country and the election of the Constitutional Assembly has been completed a little more than 6 months (CA election was held on 10 April 2008). Interim constitution is prevalent in the country and this interim constitution under the Clause 16 has a provision of right regarding Environment and Health. This clause states that every person shall have the right to live in clean environment. Also under the state policies (35) the constitution has specified that the state shall make necessary arrangements to maintain clean environment. It also goes on to say that the State shall give priority to the protection of the environment, and also to the prevention to its further damage due to physical development activities by increasing the awareness of the general public about environmental cleanliness, and the State

[5] Interim Constitution of Nepal

shall also make arrangements for the special protection of the environment and the rare wildlife. Provision shall be made for the protection of the forest, vegetation and biodiversity, its sustainable use and for equitable distribution of the benefit derived from it. These provisions clearly show that the state has the responsibility to formulate and implement HW management in the country.

9.4.2 Three Year Interim Plan (2007/08 – 2009/10)[6]

Nepal has implemented 10 national plans since 1956; the last one being the Tenth Five Year Plan (2002 – 2007). From 2002, an interim three year plan has been formulated by the National Planning Commission. Under the Local Infrastructure Development Programs, this Plan has the following provision with regards to the Hazardous Waste Management under (m) Environment and Waste Management:

> *Special effort will be made towards establishing a processing center for the management of biodegradable wastes in Kathmandu valley. Initiative will be made towards modifying and updating the National Policy, 1997 for waste management with the participation of concerned stakeholders. Hazardous wastes generated from the industries and hospitals, will be managed by the institutions concerned without health consequences resulting from management of such wastes. The municipalities and urbanizing VDCs, those geographically nearer and connected to transportation for easy accessibility, shall work jointly in community awareness building, Management of landfill sites, organic fertilizer production and energy development. The Waste Management and Resource Mobilization Center will facilitate this initiative.*
>
> *Efforts shall be made towards increasing private sector participation and promotion of public-private partnership in tasks relating to waste management such as, collection, storage, transport, sorting, recycling and processing of wastes.*

[6] NPC, 2007. *Three Year Interim Plan,* National Planning Commission, Government of Nepal

9.4.3 Sustainable Development Agenda for Nepal[7]

Government of Nepal, National Planning Commission and the Ministry of Environment has prepared the Sustainable Development Agenda for Nepal in 2003 and under the solid waste management issue it has specified as follows:

> *The objectives by 2017 include promotion of a reduction in waste volume, as well as increased reuse and recycling. HMG will also encourage research and industry to work together to create cyclical flows of materials, requiring factory products to be easily disassembled and separated by material, and factory byproducts to be reused. HMG will also create conditions that facilitate the establishment of recycling centers that have economies of scale, and the establishment of hazardous waste management centers whose costs are paid for by products that emit the waste. Only non-recyclable waste is to be disposed in environmentally sound sanitary landfills.*

9.4.4 Nepal Environmental Policy and Action Plan (NEPAP)

Government of Nepal had prepared the Nepal Environmental Policy and Action Plan (NEPAP) to show its firm commitment to integrate environmental concerns with development objectives, and to address environmental problems. This policy has specified its five main objectives as follows:

- *To manage efficiently and sustainably natural and physical resources*
- *To balance development efforts and environmental conservation for sustainable fulfillment of the basic needs of the people*
- *To safeguard national heritage*
- *To mitigate the adverse environmental impacts of development projects and human actions*
- *To integrate environment and development through appropriate institutions, adequate legislation and economic incentives, and sufficient public resources.*

Recognizing the worsening pollution of air and water especially in the Kathmandu

[7] HMGN/NPC/MOPE, 2003 *Sustainable Development Agenda for Nepal,* Government of Nepal, National Planning Commission and Ministry of Population and Environment.

Valley and some towns of Terai, the Government has specified defining and implementing appropriate zoning regulations, setting of standards and their enforcement through a carefully designed package of incentives and regulation, and the clear designation of responsible institutions for providing infrastructure and utility services.

9.4.5 Environmental Protection Act and Environmental Protection Rules, 1997

The act has the provision to prepare Environmental Impact Assessment (EIA) or Initial Environmental Examination (IEE) and apply for approval From the Ministry of Environment, Science and Technology (MOEST) or Concerned Agency for implementation of proposals that has adverse impacts on environment as specified in the Annex – 1 and Annex – 2 of the EPR (Clause 3 to 6 of EPA). Proposals involving Hazardous Wastes are included in the list provided in the Annexes.

Clause 7 of the Act has the following provision:

1. *Nobody shall create pollution in such a manner as to cause significant adverse impacts on the environment or likely to be hazardous to public life and people's health, or dispose or cause to be disposed sound, heat radioactive rays and wastes from any mechanical devices, industrial enterprises, or other places contrary to the prescribed standards.*

2. *If it appears that anyone has carried out any act contrary to sub-section (1) and caused significant adverse impacts on the environment, the concerned agency may prescribed necessary terms in regard thereto or may prohibit the carrying out of such an act.*

3. *If it appears that the use of any types of substance, fuel tools or device has caused or is likely to cause significant adverse impacts on the environment, the Ministry may, by a notification in the Nepal Gazette, forbid the use of such substance, fuel, tools or device.*

4. *Other provision relating to the prevention and control of pollution shall be as prescribed.*

The Act also has the provision to appoint Environmental Inspectors for ensuring mitigation, prevention and control of pollution and for ensuring that the proposals are being implemented as per the provisions of the approved EIA or IEE. Such inspectors have authority to inspect, test or examine premises, machinery equipment, vehicles, documents or goods.

Clause 11 of the Act has the provision to establish different laboratories or to specify existing laboratory for the carrying out works to facilitate environmental protection and pollution control. Similarly, Clause 12 of the Act requires concerned person, institution or proponent to allow authorized person to collect samples of wastes from industrial units, machinery, and vehicles etc. for study, test or analysis. Clause 13 has the provision of Environment Protection Fund. Clause 15 provides for additional Incentives and Facilities for positive response to environment by industry, business or process

As per the Clause 16, formation of different committees with concerned experts – scope of work, responsibilities and authorities may be specified. Clause 17 of the Act provides for claim of compensation for any loss or damage due to pollution. Clause 18 has the provision of punishment for carrying out activities without approval or in contrary to approved proposal. Such activity can be closed immediately and the person or agency carrying such activities may be fined up to NPR 100,000/-

The act also has provisions for delegation of authorities, formulation of guidelines or directives. It also provides for formulation of regulations on topics such as:

- Proposal
- Conduction of IEE/EIA
- Source, standards, prevention and control of pollution
- Biodiversity and protection of National heritages
- Water, air, noise, sound pollution
- Management and transportation of
- Operation of Environment Protection Fund
- Other necessary matters

9.4.6 Solid Waste Management and Resource Mobilization Act, 1987

Rules have been formulated in 1989. The rules provide the procedures for the management of solid waste. Sections 5.1.1.16 and 17 state that hazardous waste can not be emitted, thrown, stored or disposed in any place other than place designated by the SWM&RMC. However, the act does not provide authority to fine who violate such provisions.

The act is being revised and the draft act has the definitions of Harmful waste, Medical waste, Industrial Waste. The draft act has the provision that the Industrial enterprises, Business enterprises, Educational institutions, hospitals, nursing homes, private clinic,

pathology labs, will be responsible to manage the their waste generated as per the technology that meets the specified standards[8].

9.4.7 Industrial Enterprise Act, 1992

The act requires the industries, which may cause adverse effect on the security, public health and environment to take permission. IEE or EIA is needed for giving the permission. The act has the provision of Industrial Promotion Board (IPB), the highest body responsible for industrial development in the country. Clause 13 (a) of the act specifies that the IPB has to oversee that the industries follow the measures for the prevention of environmental pollution. Clause 15 (k) provides that the industries will be granted up to 50 percent reduction in the taxable income for the investment on process or equipment, which has the objective of controlling pollution. Such remission may be deducted on a lump sum or on installment basis within three years. Industry manufacturing pollution control device is included in the list of priority industries.

9.4.8 Local Self Governance Act, 1999

This act gives the local authorities wards, VDCs and Municipalities the roles and responsibility regarding the management of wastes. The Ward committees have the function to arrange disposal of waste [25(b)]. VDC has the function to prepare programme on waste disposal [28(g)2]. VDC can impose fine of up to NPR 100/- and expenses incurred in the cleaning for dumping waste at place other than designated area. Municipalities have the role of preserving and protecting rivers, lakes, ponds form pollution; managing collection, transportation and disposal of wastes under [96(c)7]. Municipality may impose service charge for solid waste management 145(2). Municipality can fine up to NPR 15,000/- on a person disposing waste at place other than designated plus the expenses for removal of such waste - 165(C)

9.4.9 Labour Act, 1991

This act regulates the labour and working environment. Chapter 5 of the act deals with occupational health and safety aspects. Clause 27(C) requires the removal and disposal of solid waste and sewage. It also provides for prevention of accumulation of dust, fume, vapour and other impure materials in the working room for safety and health consideration. Clause 29 provides for protection from chemical substances, provision of protective equipment and fire safety.

[8] Solid Waste Management Act, 2064 – Draft (in Nepali)

9.5 Types and Quantities of HW[9]

Under ADB RETA 6361 inventory of HW was prepared for Nepal. The study focused on the hazardous wastes generated by industrial sector, biomedical hazardous wastes and wastes generation from the automobile workshops.

The hazardous wastes prone 12 industrial sectors were identified during a workshop organized by MOEST. These are:

1. Dry Cell	2. Pharmaceuticals
3. Foam	4. Soap
5. Iron Galvanizing	6. Tannery
7. Paint	8. Textile Dyeing
9. Paper and Pulp	10. Vegetable Oil
11. Pest/Insecticides	12. Wool Dyeing

The sample surveys of industrial enterprises from each of the sectors were conducted covering all important industrial areas of the country. Hazardous solid and liquid wastes from all these industrial sectors were found to be increasing for the projected periods except for the wool dyeing sector. The total amount of hazardous solid waste generated by these 12 sectors of industries in the country is estimated to be 5,051 M/T per annum for the fiscal year 2006/07 and the quantities of such waste after five and ten years have been projected to be 5,732 M/T and 6,589 M/T per annum respectively. Similarly, the total amount of hazardous liquid waste generated by these 12 sectors of industries has been estimated to be 6,404,872 cu. m. per annum for the fiscal year 2006/07 and the quantities of such waste after five and ten years have been projected to be 7,088,305 cu. m. and 7,879,080 cu. m. per annum respectively.

The preparation of biomedical hazardous waste inventory was based on sample survey of hospital waste and review of study reports, literatures, related publications and documents on health care wastes. Most health care institutions so not have systematic way of record keeping systems. Eleven health care institutions were surveyed through the questionnaires and interview with the officials. The average bed occupancy rate is found to be 70 percent and the average Health Care Risk Waste (HCRW) generation is

[9] MOEST/ADB, 2008 *Report of Hazardous Waste Inventory Nepal*

0.47 Kg/patient/day. The generation of biomedical hazardous wastes from all the health care institutions in the country has been estimated to be 4,195 M/T for the year 2006/07. The quantity of such wastes is increasing every year and the volume is expected to double in next ten years.

In order to estimate the hazardous wastes generated from the automobile workshops, a total of 22 automobile workshops were sampled covering all large, medium and small size workshops at different locations of Kathmandu valley. The Hazardous Wastes both solid and liquid have been found to be increasing. The total amount of hazardous solid waste generated by these Automobile Workshops in the country is estimated to be 3,465 M/T per annum for the fiscal year 2006/07 and the quantities of such waste after five and ten years have been projected to be 7,073 M/T and 15,635 M/T per annum respectively. Similarly, the total amount of hazardous liquid waste generated by these Automobile Workshops in the country has been estimated to be 157,757 cu. m. per annum for the fiscal year 2006/07 and the quantities of such waste after five and ten years have been projected to be 353,045 cu. m. and 790,683 cu. m. per annum respectively.

Used batteries also form hazardous waste. Such battery wastes from automobiles have been captured in the survey of the auto workshops. But such waste are also generated by solar energy system and also now more prominently by use of uninterrupted power supplies for computers and inverter systems being used due to load shedding. A study had estimated the scrap battery from solar systems and other stationary sources to be 20 – 30 M/T for the year 1998 and projected such battery scrap to the tune of 110 – 190 M/T for 2008[10].

Similarly, another study has quantified the generation of Dioxins (Polychlorinated dibenzo-p-dioxins) and Furans (Polychlorinated dibenzofurans) to be 312.5 gram TEQ per year for the country[11].

[10] DANIDA/COWI, 2003 *Study on Environmentally benign Handling, disposal and recycling of used lead-acid batteries in Nepal.*

[11] MOEST/ Pokharel N.P. *Inventory of Dioxin and Furans for the Kingdom of Nepal*, POPs Enabling Activities Project – Final Draft Report

9.5 Present Practices

Urban areas have seen rapid increase in the generation of wastes. People still have not developed good attitude and practice in the management of waste. Traditional habits of throwing waste anywhere is prevalent. "The cleaning of waste as the duty of the low cast people" is the traditional belief still existing in most people.

Industrial Waste

Except for some large scale industries in the country and some industries owned by the multi national companies, all the industries are discharging their wastes, effluents and emissions without any effort to prevent or control. In most cases, solid wastes that carry some value are sold to be reused. If the solid waste does not have any value, these are just disposed without any environmental considerations.

Wastewater is directly discharged to drains that ultimately flow into surface waster like river or lakes. Although MOEST (previously MOPE) has promulgated effluent standards for important nine sectors of industries namely the Tannery, Wool Processing, Fermentation, Vegetable Ghee, Pulp and Paper, Dairy, Sugar, Cotton Textile and Soap as there is no monitoring and enforcement system, the industries have not taken any effort to comply with the standards or the prescribed tolerance limits. Many of the Leather Tanning industries have been helped by the government with the financial and technical assistance of UNIDO and UNDP to install wastewater treatment plants and common wastewater treatment plants. But as there is no enforcement and penalization for non-compliance, such units are practically not being operated.

A huge common wastewater treatment plant constructed at the Hetauda Industrial District with the financial and technical assistance of the Government of Denmark for the treatment of effluents of the industries operating inside the industrial district and to save the Karra River from being polluted is turning to be a liability. The plant was constructed at the cost of NPR 570 million and it has been operated for more than 5 years with the joint funding of the Government of Denmark and Government of Nepal. Government of Denmark has reduced its support and the Government of Nepal has increased its contribution for the operation of the plant. Now as per the agreed terms, Demark will not be bearing any expenses. Industries inside the industrial district do not want to pay for the treatment charges as the industries outside the district do not have to comply with the standards.

Some of the industries have installed air pollution mitigating equipments. However, the industries are not operating such equipment or the maintenance is poor resulting in improper operation of such equipment.

The above practices have resulted in the deposition of solid wastes near to the banks of rivers. Effluents have contaminated the rivers beyond the use near to all the urban areas. Air pollution has become highly prominent again around the urban and industrial belts.

The Government of Nepal has implemented some projects and programmes with the assistance of the donor organizations. Industrial Pollution Control Management (IPCM) Project and Environment Sector Programme Support (ESPS) had promoted Cleaner Production, Energy Efficiency and Environmental Management Systems in more than 300 units of industries. However, the industries have not internalized these preventive approaches due to lack of monitoring and enforcement of the environmental rules.

Hospital Waste[12]

Solid Wastes are often collected without any process of separation according to the type of waste. These solid wastes whether they are general waste or infectious waste are taken directly to the Municipal Waste container and ultimately find their destination at the landfill site. However, sharps are collected separately. Only a few of the healthcare units have written information and training on waste segregation. Infectious wastes are collected in the open plastic buckets without any plastic bags.

Liquid wastes from wards and departments in a healthcare institution such as samples, cultures, blood and body fluid, faeces and urine, vomiting, cleaning, housekeeping wastes, ethylene, chemicals generated from diagnostic procedures, chemotherapy wastes, Waste pharmaceuticals and Photographic processing chemicals, solvents are directly discharged to the municipal sewers. Dental treatments also discharge silver and mercury containing liquid wastes to the municipal drains.

Due to unavailability of proper disposal system, all the wastes are collected together and

[12] MOHP, 2006 *Healthcare Waste Management in Nepal – Assessment of present state and establishment of a framework strategy and action plan for improvement.*

thrown close to the river bank. A small amount of hazardous waste mixed with a large amount of general waste turns the whole quantity into hazardous waste. Even at some healthcare institutions, where some degree of segregation is practiced, all the segregated wastes finally land up in the municipal container. Rag pickers are found to collect some recyclable items from the mixed wastes thrown at the public containers or at waste transfer sites. Rivers are being contaminated mainly from the liquid discharge to the municipal sewers. Soil is also getting contaminated from HCRW in the municipal landfills due to non-availability of separate sanitary landfill.

Although some of the healthcare units have installed incinerator, these are not operated in most cases. In some units, where they are operated, the operation is not free from hazard as they produce smoke and dust pollution and most often the general public around the area complain and stop the operation. The quality of equipment installed is not good enough or the maintenance is not given adequate attention.

Auto Workshop Waste[13]

Automobile workshops are mainly located in the urban areas and therefore disposals, effluents and emissions expose greater number of people. Automobiles workshops generate solid and liquid wastes. Solid wastes generated by workshops are washing sludge, welding dust (carbide), empty metallic and plastic containers, oil residue, cotton waste, filters, lead from waste battery. These are of toxic, corrosive / alkaline and flammable in nature.

Liquid wastes include spent lubricating oil, kerosene oil and petrol, washed water and sulphuric acid from waste batteries. Liquid wastes are of corrosive and flammable in nature. The sludge generation from workshops are temporarily stored within the premises and disposed off to nearby open public area and sometimes disposed to the river banks.

Cotton wastes are burnt within the workshop premises in certain intervals depending upon the collection of such wastes. Oil residue, used kerosene oil and petrol are mixed with the spent oil (lubricating oil, gear oil) in a drum and sold to the collectors. These oils are mainly used as fuel in furnaces. Filters, empty containers, lead and lead compounds

[13] Source: discussion with the engineers in the automobile workshop, CP consultants and Inventory consultant and surveyors.

are sold to the scrap collectors and later go to recycling process. Some of the welding dust (carbide) are either used as washing powder or mixed with the sludge.

The wash water contaminated with soap, detergent, grease and oil (corrosive / alkaline in nature) are directly discharged to the municipal sewer and pollute water body in the river. Recycle reuse of the washed water is not in practice. Recycling of lead and lead compounds are found to result in the major health hazard problem

10. Preparation of the Documents and Consultation

As given under the methodology, the National Consultant interacted with various government and private sector institutions and prepared a work plan for carrying out the assignment. The work plan prepared is presented in the Annex – 1. Ministry of Environment, Science and Technology (MOEST) had formed a steering committee for the Hazardous Waste Inventory Preparation and it was decided during the initial meeting with the Joint Secretary and Chief of the Environment Division of MOEST that this committee will be retained also for the inputs and approval of the draft policy being formulated. The minutes of the meeting are attached as Annex – 2 and the formation of the steering committee is attached as Annex- 3.

National consultant prepared a draft policy consultation methodology and a list of identified stakeholders to be involved in the process specifically in the workshop to be held after the formulation of the draft policy documents. These were circulated to the authorities in MOEST, members of the Steering Committee and also to ADB. The first meeting of the steering committee held on 7 November 2008 approved the work plan and the consultation methodology. The consultation methodology is presented as Annex – 4. The tentative list of stakeholders to be involved is given as Annex – 5.

As per the methodology, literature study was carried out and the draft documents were prepared in the policy format of the Government of Nepal. Focus group discussions were held with the MOEST technical personnel, Cleaner Production Professionals and apex private sector association. Prepared documents were circulated to the members of the steering committee and meetings of the Committee were held to discuss on the feedback and comments. The minutes of the three steering committee meetings held have been presented in the Annex – 6.

Annex – 7 presents the list of persons met and discussions held during the process of formulation of the draft policy. The final draft policy prepared has been attached as Annex- 8. Institutional Arrangement and Capacity Building Needs have been presented as Annex – 9 and Annex – 10. A workshop was conducted on 21st December 2008 to obtain feedback and inputs from wider group of stakeholders relating to HWM policy. The report of the workshop as submitted by the appointed Rapporteurs has been attached as Annex – 11.

11. Conclusions and Recommendations

Generation of hazardous waste is increasing with the increase in the economic activities and also with the increase in the consumption pattern in Nepal. Although there have been no specific studies with regards to the impact of hazardous waste generation on the human health in the country, the deteriorating conditions of the natural environmental resources points out the urgent need for addressing the issue to manage such wastes.

Most of the hazardous wastes generated are toxic or corrosive / alkaline in nature. The amount of total hazardous solid and liquid wastes estimated is found to be high due to the practice of mixing the hazardous waste with non-hazardous. This fact indicates that there is a great challenge and hence tremendous opportunity for the government and environmentalists to promote awareness and segregation to reduce the quantity of hazardous wastes. This can be achieved more easily by promoting Cleaner Production and 3R principles before carrying out any treatment or disposal.

It is also proven fact that the implementation of the Hazardous Waste Management Policy is costly and government will need to allocate resources both human as well as financial to implement the provisions of the policies to minimize the adverse impact of such waste on the human and environment. First of all, the government must discuss in depth and ensure that it is committed to implement the policy. Mere adoption of the policy without allocation of resources and without effective monitoring and enforcement will not bring any desirable result. This may be more detrimental by penalizing the good while the benefit will be enjoyed by defaulters and violators.

Therefore, it is strongly recommended that the Government of Nepal must discuss on the draft policy and adopt it for effective implementation. Effective monitoring and enforcement of the policy measures alone will stop and minimize the contamination of

the natural environmental resources and clean up the already polluted water bodies, unhealthy contamination of the Municipal Solid Waste and toxic releases to the atmosphere.

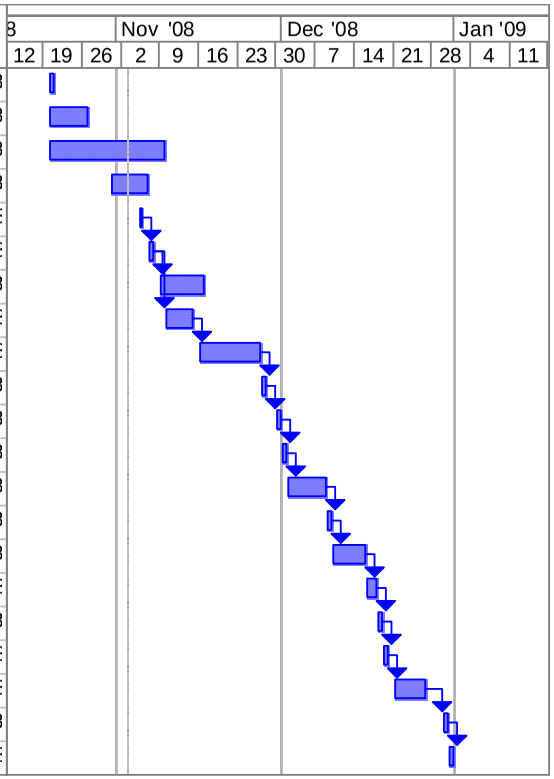
Annex – 1: Work Plan

The list of activities to be conducted for the drafting of the policy and consultations to the carried out are presented below:

- Meeting with the Authorities in the MOEST
- Collection of relevant documents, publications
- Literature Review
- Identification of the Stakeholders
- Discussion with Officials of MOEST on approach and contents of Policy document
- Presentation to Steering Committee (already formed) to have feedback on approach and contents of policy document
- Desk work on drafting the policy, institutional arrangement, and training needs
- Discussion with officials during the preparation of draft policy institutional arrangement, and training needs document
- Preparation of draft policy document including institutional arrangement, and training needs
- Submission of the Initial Report to MOEST with copy to ADB
- Presentation of draft policy document including institutional arrangement, and training needs to Steering Committee on HW for feed back and Comments
- Discussion with officials of MOEST on incorporation of comments and suggestions from Steering Committee meeting
- Incorporating comments and suggestion from Steering Committee.
- Circulation of the draft report with incorporation of comments to the steering committee members
- Planning and preparation for a national workshop with the Stakeholders
- Distribution of the documents among the stakeholders
- Conduction of National Workshop
- Discussion with officials of MOEST on comments from workshop
- Incorporation of the comments from the workshop
- Meeting of steering committee to finalize the reports
- Submission of the final draft reports to the MOEST and ADB

The proposed work plan to execute the above activities is presented below:

ID	Task Name	Duration	Start	Finish
1	Meeting with the MOEST Authorities	1 day	Mon 10/20/08	Mon 10/20/08
2	Collection of relevant documents and publications	6 days	Mon 10/20/08	Sun 10/26/08
3	Literature Review	15 days	Mon 10/20/08	Sun 11/9/08
4	Identification of the Stakeholders	6 days	Fri 10/31/08	Thu 11/6/08
5	Discussion with Officials of MOEST on approach and contents	1 day	Wed 11/5/08	Wed 11/5/08
6	Steering Committee Meeting 1 to finalize approach and contents	1 day	Fri 11/7/08	Fri 11/7/08
7	Desk study for drafting the policy, IA and TN	7 days	Sun 11/9/08	Sun 11/16/08
8	Discussion with MOEST officials	5 days	Mon 11/10/08	Fri 11/14/08
9	Preparation of draft documents	10 days	Sun 11/16/08	Wed 11/26/08
10	Submission of the Initial Report to MOEST with copy to ADB	1 day	Thu 11/27/08	Thu 11/27/08
11	Steering Committee Meeting 2 to discuss on the draft	1 day	Sun 11/30/08	Sun 11/30/08
12	Discussion with officials of MOEST	1 day	Mon 12/1/08	Mon 12/1/08
13	Incorporating comments and suggestion	6 days	Tue 12/2/08	Mon 12/8/08
14	Circulation of the reports to the steering committee members	1 day	Tue 12/9/08	Tue 12/9/08
15	Planning and preparation for a national workshop with the Stakeholders	5 days	Wed 12/10/08	Mon 12/15/08
16	Distribution of the documents among the stakeholders	2 days	Tue 12/16/08	Wed 12/17/08
17	Conduction of National Workshop	1 day	Thu 12/18/08	Thu 12/18/08
18	Discussion with officials of MOEST on workshop	1 day	Fri 12/19/08	Fri 12/19/08
19	Incorporation of the comments from the workshop	5 days	Sun 12/21/08	Fri 12/26/08
20	Meeting of steering committee 3 to finalize the reports	1 day?	Tue 12/30/08	Tue 12/30/08
21	Submission of the final draft reports to the MOEST and ADB	1 day?	Wed 12/31/08	Wed 12/31/08



Annex – 2: Minutes of the Meeting at MOEST

Date: 20 October 2008

Venue: Ministry of Environment, Science and Technology (MOEST)

Policy Specialist for Nepal under the Project: TA – 6361 (REG): Managing Hazardous Waste; Contract: S16762, Mr. Amar B. Manandhar requested for an appointment with Mr. Purushottam Ghimire, Joint Secretary, Ministry of Environment, Science and Technology (MOEST) to discuss on the Policy Consultation for Managing Hazardous Waste. During the meeting discussions were held on the following aspects:

- Scope of work as given in the Terms of Reference (TOR)
- Steering committee for the policy consultation
- Collection of relevant materials
- Format of Policy document to be prepared
- Meeting of the steering committee

It was decided as follows:

1. The steering committee formed for the preparation of the Hazardous Waste Inventory will be continued also for the policy consultation as well.
2. Mr. Manandhar will collect relevant documents, publications and initiate literature study. Such Hazardous Waste Management Policy for India and a few other countries are to be collected and studied.
3. The draft policy will be prepared in Policy format used in Nepalese context in English Language in the beginning and it will be translated into Nepali language as well.
4. Mr. Manandhar will prepare draft policy consultation methodology along with a work plan for the consultation process and production of all the outputs as given in the TOR.
5. The steering committee meeting is proposed to be held on 7 November at 2:00 pm to discuss on the draft HWM policy formulation process.

Annex – 3: Formation of Steering Committee on HWM

The formation of the Steering Committee is as given below:

1. Joint Secretary and Chief, Environment Division, MOEST – Chairperson
2. Representative, National Planning Commission (NPC)
3. Representative, Ministry of Finance (MOF)
4. Representative, Ministry of Physical Planning & Works (MOPPW)
5. Representative, Ministry of Health and Population (MOHP)
6. Representative, Ministry of Labour and Transport Management (MOLTM)
7. Representative, Ministry of Forest and Soil Conservation (MOFSC)
8. Representative, Ministry of Industry (MOI)
9. Representative, Ministry of Tourism and Civil Aviation (MOTCA)
10. Representative, Ministry of Agriculture and Cooperatives (MOAC)
11. Representative, Chemistry Department, Tribhuvan University (TU)
12. Representative, Federation of Nepalese Chambers of Industry and Commerce (FNCCI)
13. Representative, Chambers of Commerce
14. Representative, Confederation of Nepalese Industries (CNI)
15. Chief, Environment Management Department, Kathmandu Metropolitan City (KMC)
16. Representative, Bir Hospital Development Committee
17. Representative Om Hospital
18. Chief, Environmental Standards and Monitoring Section, MOEST
19. Mechanical Engineer, Environmental Standards and Monitoring Section, MOEST - invitee
20. Chemist, Environmental Standards and Monitoring Section, MOEST - Invitee
21. Consultant, Hazardous Waste Inventory - Invitee
22. Consultant, Hazardous Waste Management Policy – Invitee
23. Invitees as deemed necessary by MOEST

Annex – 4: Draft Policy Consultation Methodology

The draft policy on Hazardous Waste Management (HWM) will be prepared with the involvement and in consultation of all stakeholders in Nepal. Lessons from the implementation of HWM in the developed countries and existing conditions in the country will be utilized in the preparation of the very first initial draft by the national consultant. The draft policy will be supplemented with the recommendation of the institutional arrangement and training and capacity building needs for the implementation of the policy. Within the limitation of two months' period adequate consultations will be carried out as given below:

1. Focus Group Discussion MOEST Team

Focus group discussion will be held among the national consultant and a team of three technical officers of the Pollution Section of the Ministry of Environment, Science and Technology (MOEST). Such discussion will be held on all the drafts prepared. This type of discussion will be very useful to incorporate the existing knowledge, capabilities and concerns of the officials working in the Ministry. This will also ensure the ownership of the prepared documents.

2. Focus Group Discussion CP Professional

Cleaner Production consultants working with PACE Nepal Pvt. Ltd. have very good experience in assessment and implementation of CP in industries and service sectors in the country. Periodic discussion with them on the issues of policy formulation on HWM, institutional set up and training and capacity building needs will be highly fruitful for effective implementation of the formulated policy.

3. Meetings and Discussions

The report of the HW inventory has been prepared for priority sectors and important hazardous wastes in Nepalese context. They include chemical wastes from manufacturing industries, healthcare risk wastes and wastes from automobile workshops. Therefore, association of manufacturing industries or Federation of Nepalese Chamber of Commerce and Industry (FNCCI), National Health Research Council (NHRC) and Association of Automobile Workshops or some workshops will be visited to discuss on their views for the formulation of the draft policy and once the draft is prepared they will be requested to send their feedback.

4. Steering Committee

MOEST has formed a steering committee for the preparation of the HW inventory. This committee has the representatives from major stakeholders for the implementation of hazardous waste management. This committee will be involved and utilized to approve the proposed approach for the preparation of the draft policy document. The prepared draft documents will also be presented to this committee for their review, feedback and comments. Three meetings of this committee will be held one for the approval of the approach and two for the finalization of the draft documents.

5. Stakeholders' Workshop

All the stakeholders will be identified and they will be sent the draft documents prepared. The documents will consist of the draft policy on HWM, draft institutional arrangement and draft proposal for the training and capacity building for the implementation of the proposed policy on HWM. A national level workshop will be organized and the stakeholders will be invited to participate. The feedbacks and comments obtained from the stakeholders in the workshop will be properly recorded utilizing Rapporteurs. The final draft documents will have incorporated all the relevant feedbacks and comments.

6. Feedback from ADB

ADB will be sent an initial report with four documents namely the draft policy consultation methodology, the draft policy on HWM, the institutional arrangement, and the training and capacity building need for the implementation of the policy. Feedbacks and comments from ADB will also be incorporated along with the comments from the focus, group, associations and the stakeholders during the workshop.

The complete list of activities for the preparation of the documents and consultations is presented below:

7. List of Activities

- Meeting with the Authorities in the MOEST
- Collection of relevant documents, publications
- Literature Review
- Identification of the Stakeholders
- Discussion with Officials of MOEST on approach and contents of Policy document
- Presentation to Steering Committee (already formed) to have feedback on approach and contents of policy document

- Desk work on drafting the policy, institutional arrangement, and training needs
- Discussion with officials during the preparation of draft policy institutional arrangement, and training needs document
- Preparation of draft policy document including institutional arrangement, and training needs
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- Planning and preparation for a national workshop with the Stakeholders
- Distribution of the documents among the stakeholders
- Conduction of National Workshop
- Discussion with officials of MOEST on comments from workshop
- Incorporation of the comments from the workshop
- Meeting of steering committee to finalize the reports
- Submission of the final draft reports to the MOEST and ADB

Annex – 5: Identification of Stakeholders for HWM

1. Government Policy makers and regulators
    a. Ministry of Environment, Science & Technology (MOEST)
    b. Ministry of Local Development (MOLD) - SWMRMC
    c. Ministry of Industry (MOI)
    d. National Planning Commission (NPC)
    e. Ministry of Health and Population (MOHP)
    f. Municipalities – Kathmandu Valley
    g. Ministry of Agriculture and Cooperatives – Pesticide Board
    h. Ministry of Labour & Transport Management
    i. Others
        i. Ministry of Commerce & Supplies
        ii. Ministry of Finance (MOF)
        iii. District Development Committees

2. Waste Generators
    a. Industries (Industrial Associations)
        i. Federation of Nepalese Chambers of Commerce and Industry (FNCCI)
        ii. Confederation of Nepalese Industries (CNI)
        iii. Federation of Nepalese Cottage and Small Industries (FNCSI)
    b. Hospitals
        i. Bir Hospital
        ii. Teaching Hospital
        iii. Private – OM Hospital, Nepal Medical College
    c. Vehicle Workshop -
    d. Water Treatment Plants – Kathmandu Valley Water Supply
    e. Wastewater Treatment Plants – Guheswori Treatment Plant

3. Waste Industry
    a. Kawadis Association
    b. Recycling Industry – Guheswori Rolling, Eviroplast

4. Transport
    a. Transport Companies – associations, Kawadis
    b. Waste transporters – Municipalities Vehicle in-charge, private sector rickshaw

5. Consultants
    a. Plant Project Engineering Consultants – National Productivity and Economic Development Center
    b. EIA consultants
        i. PACE Nepal
        ii. Nepal Environment and Scientific Services
        iii. Soiltest

6. University and Training Bodies
    a. TU – Engineering Institute – Center for Pollution Studies & Environment
    b. Kathmandu University – Environmental Department
    c. School of Environmental Management and Science (SchEMS)

7. Technology Providers
    a. Nepal Academy of Science and Technology
    b. Research Center for Applied Science and Technology (RECAST)

8. International Agencies
    a. Asian Development Bank
    b. Danish International Development Assistance
    c. FINNIDA
    d. GTZ
    e. Japanese International Cooperation Agency (JICA)
    f. United nations Development Programme

9. Media
    a. Nepal TV, Avenues TV, Sagarmatha TV, Image Channel, Kantipur TV, ABC
    b. Gorkhapatra Sansthan, International Media Network, Kantipur Publications
    c. Radio Nepal, Sagarmatha FM

10. NGOs
    a. Society for Environment and Economic Development Nepal (SEED Nepal)
    b. Environment and Public Health Organization (ENPHO)
    c. Nepal Federation of Environmental Journalists (NEFEJ)

11. Public Groups
    a. Local Clubs

12. Purchasing Consumers

    Consumer Forum

Annex – 6: Minutes of the Steering Committee Meetings

Minutes of the Steering Committee Meeting

First Steering Committee Meeting

The meeting of the steering committee on Hazardous Waste Management was held on this 7th Day of November 2008 under the chairmanship of Mr. Purushottam Ghimire, Joint Secretary of the Ministry of Environment, Science and Technology (MOEST). The meeting was attended by the following persons:

Attendance

1. Mr. Purushottam Ghimire, Joint Secretary, MOEST and Chairperson
2. Mr. Ramesh Sthapit, Chief, Env. Standards and Monitoring Section, MOEST
3. Mr. Bidhya Nath Bhattarai, Senior Div. Eng., Ministry of Physical Planning & Works
4. Mr. Sanjay Giri, Chairperson of Producivity and Environment Committee, FNCCI
5. Mr. Suresh Shrestha, Mechanical Engineer, Ministry of Labour and Transport Management
6. Mr. Rabindra K.C., Statistical Officer, Ministry of Health and Population
7. Ms. Neera Pradhan, Environmental Officer, Ministry of Forest and Soil Conservation
8. Ms. Romi Manandhar, Senior Div. Chemical Engineer, Ministry of Industry
9. Mr. Krishna Prasad Dhungana, Ministry of Tourism and Civil Aviation
10. Mr. Mani Ratna Shakya, Confederation of Nepalese Industries
11. Mr. Manahari Khadka, Under-secretary, National Planning Commission
12. Mr. Bipin Rajbhandary, Mechanical Engineer, MOEST
13. Mr. Biswo Babu Pudasaini, Chemist, MOEST
14. Mr. Govinda Tiwari, Director, PACE Nepal
15. Mr. Amar B. Manandhar, National Policy Consultant, ADB – TA

With the permission of the Chair, Mr. Bipin Rajbhandary welcomed all the participants in the meeting and briefed on the purpose of the meeting and reminded that documents were sent to all the participants through email. A quick round of self introduction of all the participants was held. Mr. Ramesh Sthapit requested Mr. Amar B. Manandhar to make presentation.

Mr. Amar B. Manandhar presented on the definition of Hazardous Waste (HW), need for Hazardous Waste Management (HWM), international scenario and lessons to be learnt from the management of HW in developed countries, policy principles and considerations, and existing Nepalese scenario in relation to HW including the HW inventory prepared. He also briefed on the terms of reference (TOR) for the preparation of the draft policy preparation. Then he presented on the draft policy consultation methodology, work plan and list of all the stakeholders.

The participants provided following comments and suggestions:

- The policy documents should be prepared in the ready format used in Nepalese context and in size that is not too bulky
- The policy should make provisions to provide information on the products that it has hazardous content and safe way to handle and dispose
- There needs to be provision of separate container for HW
- Considerations for the rag pickers must also be included
- Taxes and incentives must also be provided
- Definition of HW should be prepared suitable for Nepalese context
- Awareness must be emphasized
- Penalty needs to be strict for intentional dumping of HW
- Good programs must follow good policy provisions
- The draft Policy should also address pesticides
- The draft policy must include provisions for household HW as well
- Ministry of Local Development (MOLD) is revising the Solid Waste Management and Resource Mobilization Act. The proposed act needs to be considered as well.
- HW must be included in the school curriculum

All the participants thanked and congratulated Mr. Manandhar on his inputs and very good presentation. The meeting approved the draft policy consultation methodology and the work plan as presented by the consultant.

From the chair, Joint Secretary Mr. Ghimire also thanked Mr. Manandhar for his very good presentation. He also clarified that the outputs have to be produced in a very short period and there is no provision to consult outside Kathmandu Valley. However, he will explore for necessary resource to disseminate the draft policy from the consultant outside Kathmandu valley at a later stage. He also thanked all the participants for their active participants and for their contribution before declaring the meeting closed.

Minutes of the Steering Committee Meeting

Second Steering Committee Meeting

The second meeting of the steering committee on Hazardous Waste Management Policy was held on this 7th Day of December 2008 under the chairmanship of Ms. Meena Khanal, Joint Secretary of the Ministry of Environment, Science and Technology (MOEST). The meeting was attended by the following persons:

Attendance

1. Ms. Meena Khanal, Joint Secretary, Acting Chief of Environment Division, MOEST and Chairperson
2. Mr. Ramesh Sthapit, Chief, Environmental. Standards and Monitoring Section, MOEST
3. Mr. Bidya Nath Bhattarai, Senior Divisional Engineer, Ministry of Physical Planning and Works
4. Mr. Suresh Shrestha, Mechanical Engineer, Ministry of Labour and Transport Management
5. Mr. Rabindra K.C., Statistical Officer, Ministry of Health and Population
6. Ms. Romi Manandhar, Senior Divisional Chemical Engineer, Ministry of Industry
7. Mr. Krishna Prasad Dhungana, Under Secretary, Ministry of Tourism and Civil Aviation
8. Mr. Mani Ratna Shakya, Representative, Confederation of Nepalese Industries (CNI)
9. Mr. Rakesh Kumar Tripathi, Senior Divisional Chemist, Department of Customs
10. Mr. Indu Bikram Joshi, Chemist, Nepal Bureau of Standards and Metrology
11. Mr. Deepak Ratna Kansakar, Engineer, Kathmandu Metropolitan City
12. Mr. Manahari Khadka, Under Secretary, National Planning Commission Secretariat
13. Mr. Bipin Rajbhandari, Mechanical Engineer, MOEST
14. Mr. Biswo Babu Pudasaini, Chemist, MOEST
15. Mr. Govinda Tiwari, Director, PACE Nepal
16. Mr. Amar B. Manandhar, National Policy Consultant, ADB – TA

1. Joint Secretary, Acting Chief of Environment Division Ms. Khanal welcomed all the participants to the meeting and requested ADB Policy Consultant Mr. Manandhar to make the presentation on the policy documents prepared.
2. Chief of Environmental Standards and Monitoring Section, MOEST, Mr. Sthapit made the presentation on the practice of management of Hazardous Waste in Nepal. The subject covered includes practices in Alcoa CSI and the main thrust in proposed Hazardous Waste Regulations designed by MOEST.

3. ADB Policy Consultant Mr. Manandhar presented on the 3 documents regarding the draft hazardous waste management policy, institutional setup, and training and capacity building needs.

4. Following are the valuable comments and suggestions from the steering committee members:
   - To consider the Hazardous Wastes being generated in the mountain and tourism sector.
   - The proposed policy shall address awareness aspects as awareness level in the general public is very low.
   - Concern was expressed about the management of slaughter house wastes.
   - The organization chart of the health ministry given in the draft Policy document shall be updated.
   - Proposed the representative of CNI to be included in the Coordination Committee.
   - Provide more years of tax holidays for entrepreneurs operating disposal sites.
   - Provision of penalty for wrong reporting in self monitoring works
5. ADB Policy Consultant Mr. Manandhar requested all the participants to send their additional suggestions and comments through email within next 3 days.
6. Joint Secretary, acting Chief of Environment Division, MOEST Ms. Khanal from the Chair thanked all the members of the steering committee, invitee from the Bureau of Standards and Metrology, Policy Consultant Mr. Manandhar and Chief of Environmental Standard and Monitoring Section, MOEST, Mr. Sthapit for their presentations before declaring the meeting closed.

Minutes of the Steering Committee Meeting

Third Steering Committee Meeting

The third meeting of the steering committee on Hazardous Waste Management Policy was held on this 29th Day of December 2008 under the chairmanship of Mr. Purushottam Ghimire, Chief of Environment Division and Joint Secretary of the Ministry of Environment, Science and Technology (MOEST). The meeting was attended by the following persons:

Attendance

1. Mr. Purushottam Ghimire, Chief of Environment Division and Joint Secretary, MOEST and Chairperson
2. Mr. Ramesh Sthapit, Chief, Environmental. Standards and Monitoring Section, MOEST
3. Ms. Sharada Pandey, Senior Public Health Administrator, Ministry of Health and Population
4. Mr. Krishna Prasad Dhungana, Under Secretary, Ministry of Tourism and Civil Aviation
5. Mr. Bidya Nath Bhattarai, Senior Divisional Engineer, Ministry of Physical Planning and Works
6. Mr. Suresh Shrestha, Mechanical Engineer, Ministry of Labour and Transport Management
7. Ms. Romi Manandhar, Senior Divisional Chemical Engineer, Ministry of Industry
8. Mr. Sanjay Giri, Environment and Energy Coordinator, Federation of Nepalese Chambers of Commerce and Industries (FNCCI)
9. Mr. Mani Ratna Shakya, Representative, Confederation of Nepalese Industries (CNI)
10. Mr. Rakesh Kumar Tripathi, Senior Divisional Chemist, Department of Customs
11. Mr. Biswo Babu Pudasaini, Chemist, MOEST
12. Mr. Govinda Tiwari, Director, PACE Nepal Pvt. Ltd. and Hazardous Waste Inventory Consultant
13. Ms. Neera Pradhan, Environmental Officer, Ministry of Forest and Soil Conservation
14. Mr. Vinod Gautam, Administrator, MOEST
15. Mr. Bipin Rajbhandary, mechanical Engineer, MOEST
16. Mr. Narayan Bahadur Bist, Administrative Assistant, MOEST
17. Mr. Amar B. Manandhar, National Policy Consultant, ADB – TA

1. Joint Secretary, Chief of Environment Division Mr. Ghimire welcomed all the participants to the meeting and requested ADB Policy Consultant Mr. Manandhar to make the presentation on the revised draft policy documents prepared.

2. ADB Policy Consultant Mr. Manandhar presented on the draft policy documents highlighting the incorporation of the comments from the workshop held on 21st December 2008.

3. Mr. Ghimire thanked Mr. Manandhar for the presentation and opened the floor for discussion. The discussion provided the following comments and suggestions:
   - Timely clean up and disposal of the infectious waste from Healthcare Institutions
   - Healthcare institutions must refrain from disposing the infectious wastes outside their premises along with the Municipal waste.
   - MOHP must develop a division to oversee the healthcare wastes management aspects as it is not sufficient to have just a focal person
   - A management representative must be appointed in all the healthcare units along with the committee on HCWM
   - Incinerator must be developed as an industry in government managed industrial districts under Ministry of Industry
   - Preparation of the management plan must be followed by the evidences of improvements and for this the policy has provided for the environmental recording and reporting.
   - Frequency of monitoring will be specified in the regulation or guidelines.
   - Very high penalty as mentioned in the draft policy must be avoided as it is not palatable in the policy instead the amount of penalty will be specified in the regulation
   - In the financial implication part, the estimation of budget allocation for MOHP needs to be increased greatly and similar is the case for the departments, sections and government hospitals.

4. Joint Secretary and the Chairman of the Committee Mr. Ghimire thanked all the members of the steering committee and invitees for their active participation and valuable inputs. He also made it clear that the documents prepared are only drafts and these will be circulated again to obtain the feedback and suggestions from all the concerned Ministries before these are processed for adoption by the Government. He also thanked Mr. Manandhar for his commendable effort to draft the policy documents in a short span of time. He requested Mr. Manandhar to submit the reports after incorporating the comments and suggestions.

Annex – 7: List of Persons Contacted

Mr. Umesh Prasad Mainali, Secretary, Ministry of Environment, Science and Technology

Mr. Purusottam Ghimire, Joint Secretary, Ministry of Environment, Science and Technology

Mr. Ramesh Sthapit, Chief, Environmental Standards and Monitoring Section, MOEST

Mr. Bipin Rajbhandary, Mechanical Engineer, Environmental Standards and Monitoring Section, MOEST

Mr. Biswo Babu Pudasaini, Chemist, Environmental Standards and Monitoring Section, MOEST

Dr. Padam Bahadur Chand, Division Chief, Public Health Administration, Monitoring and Evaluation Division, MOHP

Ms. Sharada Pandey, Senior Public Health Administrator, MOHP

Mr. Meghnath Dhimal, Research Officer, Environmental Health Research Unit, Nepal Health Research Council, MOHP

Mr. Rabin Man Shrestha, Chief, Environment Management Department, Kathmandu Metropolitan City

Mr. Purusotam Shakya, Mechanical Engineer, Kathmandu Metropolitan City

Ms. Romi Manandhar, Under Secretary (technical), Ministry of Industry

Mr. Rishi Koirala, Director, Department of Industry

Mr. Kush Kumar Joshi, President, Federation of Nepalese Chambers of Commerce and Industry (FNCCI)

Mr. Sanjay Giri, Coordinator, Energy Efficiency and Environment Committee, FNCCI

Mr. Udaya Bohra, Energy Efficiency and Environment Committee, FNCCI

Mr. Govinda Tiwari, Team Leader, Hazardous Waste Inventory Preparation

Mr. Durga Bahadur Karanjit, CP Consultant

Mr. Gopal K. Shrestha, CP Consultant

Mr. Deepak Kumar, CP Consultant

Mr. Dinesh P. Sah, CP Consultant

Dr. Uttam Kunwar, Project Manager, Industrial Environment Management Project

Mr. Anil Shanker Giri, Environmental Management Initiatives (EMI)

Mr. Pralhad Pathak, Shree Krishna Oil

Mr. Aamir Akhtar, United Tanneries

Mr. Nischaya Subedi, Mechanical Engineer, CG Maruti Service

Annex – 8: Draft Policy for Hazardous Waste Management

Final Draft

Draft Policy on Hazardous Waste Management

1. Background

The Government of Nepal is promoting and facilitating developmental activities in pursuit for the poverty alleviation leading to the improvement in the quality of life of the people. Realizing the need to consider the environmental aspects of the developmental activities, the Government has also emphasized the policy of integrating environment and development through appropriate institutions, adequate legislation and economic incentives, and sufficient public resources in order to achieve sustainable development.

Some developmental activities result in the generation of wastes, which are harmful to human health and environment. Industries are backbone of economic development but they make use of a number of chemicals, which are hazardous and in turn generate Hazardous Wastes. The Government is expanding and facilitating also the private sector in the establishment of health care services for ameliorating the sufferings. These healthcare institutions also produce wastes, which are harmful. Modern agriculture practices also make use of pesticides, which are also harmful.

Such harmful wastes may contaminate the natural environmental resources making them not useful for living creatures. If these wastes are not prevented, controlled and disposed properly at initial stage, they can adversely affect the whole life and food cycles and hence pose danger to human health and ecological system. Once the natural environmental resources are contaminated, the clean up is extremely costly and difficult to manage.

The inventory of hazardous waste prepared recently in July 2008 for the three important sectors namely the industry, hospital and automobile workshops showed that the estimated annual quantity of Hazardous Wastes for the year 2006/07 were 5,051 M/T of solid, 6,404,872 cu. m. of liquid from 12 important sectors of industries; 4,195 M/T of Healthcare Risk waste; and 3,465 M/T of solid and 157,757 cu. m. of liquid from the automobile workshops. The results of the study also show that the generations of above wastes are steadily increasing.

In this context, Government of Nepal would like to take steps for the proper management of Hazardous Waste in the country. For this, the present policy has been promulgated to disseminate, implement and facilitate for the implementation also by all other stakeholders of

the measures to manage Hazardous Waste and to eliminate or to minimize the adverse effects from such Hazardous Wastes on the public health and environment.

1.1 Rationale

The need for the policy on Hazardous Waste Management can not be overemphasized. The rationales for the promulgation of the policy are:

Hazardous Waste is increasing also in Nepal along every stage of the production, consumption and disposal chain. Generation and improper disposal of HW adversely affect the human health and natural environment. Protection of Human Health and Natural environment is the responsibility of all in general and of the Government in particular. Therefore, measures must be taken to manage such wastes.

As Nepal still does not have a policy on Hazardous Waste and there is no legislation to ban import of hazardous wastes into the country. This may provide opportunity for developed or other developing countries to dump hazardous wastes into Nepal.

Experience of the developed world has shown that it is much more costly to clean up the improper disposal of Hazardous Wastes and the resulting contamination to the environmental resources. Therefore, prevention, control and environmentally sound disposal are vital. It must be started before it is too late.

Nepal has been a party to Basel Convention on the Control of Trans-boundary Movement of Hazardous Wastes and their Disposal. Nepal must act to incorporate the provisions of the Convention to fulfill the international obligations.

Poorer section of the society has more and direct dependency on the natural environmental resources. The pollution of the natural resources due to contamination affect the quality of these environmental resources and in turn, adversely affect the health and living conditions of people in general and poorer section or disadvantageous group of the society in particular.

1.2 Definition of HW

Hazardous Waste may be defined as any waste, which poses threat of adverse effect on the human health and environment due to its explosive, flammable, poisonous, toxic, eco-toxic and infectious characteristics. The list of Hazardous Waste is given in the Annex – I and they are classified as Hazardous if they have the characteristics as given in the Annex - II. These annexes may be reviewed by the decision of the Government and by notification published in the Nepal Gazette.

2. Vision

This policy will contribute directly for the improvement in the quality of life of Nepalese people through prevention, minimization and control of Hazardous Waste generation, control of Hazardous Waste imports and exports, and environmental sound disposal of such Hazardous Waste through effective cooperation among government agencies, private sector, civil society and other stakeholders.

3. Objectives

This policy on Hazardous Waste has the following objectives:

- To prevent, minimize and control Hazardous Waste being generated in the country
- To create an enforcement mechanism for Hazardous Waste management
- To ensure environmentally sound management and proper disposal of Hazardous Waste
- To control the imports of wastes and waste scraps which may increase Hazardous Waste in the country; and
- To facilitate the implementation of the provisions of the Basel Convention on the Control of Trans-boundary Movement of Hazardous Wastes and their Disposal including the reduction in the trans-boundary movements.
- To build capacity of all relevant stakeholders to deal with the Hazardous Waste

4. Policy

Among the alternatives of the waste management measures, the widely accepted hierarchical preference namely the waste avoidance and minimization will be given top priority followed by recycling and safe disposal of the hazardous waste. The following specific policies shall be undertaken for the accomplishment of the aforesaid objectives:

- To require registration of all Hazardous Waste generator, transporter, recycler, treatment and disposal units.

- To make Hazardous Waste Generator responsible and obligatory for the environmental sound management of such waste.
- To give preference for the Preventive approach towards the generation of hazardous waste in the production as well as consumption level through the promotion of Cleaner Production, 3R principles and Environmental Management Systems.
- To promote and emphasize the consideration of alternative product, extension of the life of the product, and change in manufacturing process for reduction of hazardous waste at source
- To promote reduce, reuse and recycle or 3 R principle to minimize the hazardous wastes through the promotion of waste as a source of raw materials and or energy
- To conduct study and to prepare realistic plan for the development and establishment of Environmentally sound management, transfer stations and proper disposal sites for hazardous waste and to develop such sites as per the conclusion of the study
- To promote awareness and dissemination on the hazardous wastes, their effects and impacts to the general public with a view to increase their participation
- To promulgate standards of the waste emissions and effluents with special emphasis on the hazardous waste and its contribution in the contamination and degradation of the environmental resources and to enforce such standards strictly through monitoring and system of pinching penalty
- To utilize the self monitoring systems as the first tier of the monitoring system and to enhance the use of private sector laboratories in monitoring
- To discourage and prevent the import of hazardous waste and scraps that will generate hazardous waste
- To require all the HW units to record and report. There will be penalty for wrong reporting.
- To require proper packaging and labeling to differentiate hazardous waste for identification during storage, handling and transportation of Hazardous wastes
- To establish necessary organizational units and permanent committees to implement the above policies
- To involve all Stakeholders including the general public in pressurizing for environmental sound management of Hazardous Wastes
- To develop human resources necessary for the implementation of above policies

5. Strategies

Three pronged strategy shall be followed for the successful implementation of the policies to achieve the stated objectives:

i) Massive promotion of Cleaner Production and sustainable consumption, which help in the elimination and or minimization of Hazardous Wastes;

ii) Awareness raising and dissemination of information such that there is participation, support and pressure of the general public for proper management of Hazardous Waste; and

iii) Strict registration, formulation and enforcement of standards of solid waste, liquid effluents and gaseous emissions.

Facilities for the proper disposal of hazardous wastes including transfer station will be promoted initially under public private partnership until private sector comes forward totally. Support services such as relevant analytical services, consultancy services, training, and information services will be promoted in the private sector simultaneously.

The specific strategies consist of the promotion and adoption of the following principles:

- The Source Reduction Principle - by which the generation of waste should be minimized in terms of its quantity and its potential to cause pollution.
- The Precautionary Principle - whereby preventive measures are taken, considering the costs and benefits of action and inaction
- The Standardization Principle - which requires the provision of standards for the environmentally sound management of hazardous wastes at all stages of their processing, treatment, disposal and recovery
- The Least Trans-boundary Movement Principle - trans-boundary movements of hazardous wastes should be reduced to a minimum consistent with efficient and environmentally sound management
- The Polluter Pays Principle - the potential polluter must act to prevent pollution and those who cause pollution pay for remedying the consequences of that pollution
- The Principle of Sovereignty - the import of hazardous wastes will be banned into Nepal
- The Principle of Public Participation - in all stages, waste management options are considered in consultation with the public as appropriate, and that the public has access to information concerning the management of hazardous wastes

6. Implementation Policy

Implementation Policies have been given below:

6.1 By type of Policy Measures

General implementation policies by type of policy measures have been outlined below:

6.1.1 Command and Control Measures

- Any Hazardous Waste generator, HW transporter, HW storage facility, HW recycling facility, HW treatment facility or HW disposal facility will have to be registered and obtain permission from the Ministry of Environment, Science and Technology (MOEST) or any designated Agency under it.
- Hazardous Waste unit will have to obtain the Pollution Control Certificate as well.
- Any Hazardous Waste generator, HW transporter, HW storage facility, HW recycling facility, HW treatment facility or HW disposal facility will have to prepare and submit regular reporting on the type and quantity of HW generated, transported, recycled, treated, or disposed with necessary proofs. There will be penalty for wrong reporting.
- Hazardous Waste generating units will have to comply with the emission and effluent standards prescribed as per the Environment Protection Act.
- Fines and penalties as per the Environment Protection Act (EPA) will be applicable for any violation in the above requirements and compliance.

6.1.2 Information Dissemination and Use

- The Government will conduct awareness programs on Hazardous Waste. NGOs, Associations and civil society will also be encouraged to conduct such awareness programs.
- Hazardous Waste units will be encouraged to publish report on their performance in the general media so that general public are aware on how they are moving ahead besides the required reporting to the Environmental Agency (ESM Section of MOEST or Environmental Protection Authority, when formed).
- Campaigns will be developed and mass media will be encouraged and supported to publicize such campaigns

6.1.3 Voluntary Approaches

- Cleaner Production, 3R principles and EMS leading to ISO 14001 will be promoted in the HW units.
- Industry Associations will be encouraged to create Waste Exchange services such that waste of one unit may become resource for other.

6.1.4 Economic Instruments

- HW generator will be obliged to pay for all the cost attached to the environmentally sound management and disposal of HW as per the 'Polluter pays principle'.
- For any harm done due to HW, compensation may be claimed from the generator of HW
- Income Tax exemption will be provided for the construction and operation of HW treatment and disposal facilities constructed under Private Sector or Public Private Partnership (PPP) for 20 years from the day of operation of such facility. These units will receive funding of up to 45 percent from the side of the government and or bilateral and multilateral foreign agencies. Technical support will be sought from interested bilateral and multilateral foreign agencies. Established such facilities will be given necessary protection.
- Specialized materials and equipment needed for the construction of treatment and disposal facility for HW will be charged at only 1 percent custom duty under the recommendation of the technical committee on HW.
- In the initial stage government will bear higher percentage of cost and also give higher subsidy. A pilot demonstration on Hazardous Waste Treatment and Disposal will also be introduced with the assistance of a funding agency

6.2 Sector Policies

Policies with regards to the important sectors relating to Hazardous Waste are presented below:

6.2.1 Industry Sector

Industry sector will be required to implement the following policies:

- Preparation and review of Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) will focus more on the generation of Hazardous Wastes and proposed management of such wastes. Annex 5 and Annex 6 of the Environment Protection Rules will be modified to include hazardous waste aspects.

- Cleaner Production, 3R (Reduce, Reuse and Recycle) and Environmental Management System (EMS) leading to ISO 14001 certification will be promoted with the elimination and minimization of Hazardous waste.
- Standards of emissions and effluents from various sectors of industries will be formulated with tolerance limits on the Hazardous Waste load and concentration.
- The Pollution Control Certification as per the Environmental Protection Act 1997 and the Environmental Protection Rules 1997 will focus on Hazardous Waste generation by the existing industrial units. The industries will be driven to compliance with the emission and effluent standards with the enforcement mechanisms of the Pollution Control Certificate (PCC) and the terms and conditions attached to it. PCC process will be reviewed in the Environment Protection Rules.
- Industries engaged in the reuse and recycle will be provided special incentives.
- Industries will be required to carry out Self Monitoring of the emissions and effluents by using the accredited laboratories.
- Industries producing Hazardous Waste will be required to submit Environmental Reporting on regular basis; annually to start with. There will be penalty for wrong reporting.
- Professional and Trained Environmental Inspectors will be fielded to inspect the industries generating Hazardous Waste and to ascertain that they have been following the proper measures for minimization, control and environmentally sound disposal.
- A special task force for complaint handling will be formed on Hazardous Waste in the Ministry of Environment, Science and Technology (MOEST).
- Industries will be required to follow the Packaging and labeling scheme for the classification of Hazardous Waste for proper identification.
- Industrial zoning and clustering will be promoted especially for hazardous waste related industries. Common treatment plant, common incineration plants and common environment friendly disposal facilities will be promoted for use by small scale industries.
- Support services including such as analytical services, consulting services, trainings, information services relating to Hazardous waste.
- Industries, which are not in compliance with the rules based on these policies will be warned, fined and penalized.

6.2.2 Trade Sector

- Hazardous Waste will not be allowed to be imported into the country.
- Export of Hazardous Waste will only be permitted upon the receipt of the consent from the importing country.
- Custom officials and the officials of the Department of Commerce will be trained on the HW identification and control measures.
- Regional lab facility will be developed and promoted along with needed Human Resources
- Equipment or other goods brought by mountaineering expedition teams that generate hazardous waste will be imported with the condition of taking back.
- Awareness programmes will be conducted on hazardous waste and their impacts for importers, exporters and general public.

6.2.3 Service Sector

- Cleaner Production, 3R principles and EMS to be promoted for minimizing the generation of hazardous wastes
- Awareness rising on Hazardous wastes for persons working in the sector
- Auto Workshops will be required to keep records of HW and report.
- Guidelines will be prepared and HW units will be required to follow such guidelines and environmentally sound disposal of HW
- Pre-treatment facility will be required in the premises of hazardous waste prone service enterprises
- Capacity building of persons including the trainers and consultants
- Service providers will be trained on HW identification, prevention, control and sound disposal
- Analytical Laboratories will be required to manage their hazardous wastes as per the guidelines.
- Monitoring will be carried out.

6.2.4 Healthcare Sector

Implementation policies regarding the healthcare services are:

- All institutions providing healthcare services will be required to form an Environmental Health Unit and a committee for Healthcare Waste Management (HCWM) under the chief of the institution. The functions of the HCWM committee will

be prescribed in the National guidelines on HCWM. Healthcare Institutions will have to appoint a Management Representative or a focal person responsible for healthcare waste management.

- All healthcare service institutions will be required to segregate the wastes being generated into hazardous waste and non-hazardous waste at source. Healthcare Institutions will not be allowed to mix hazardous waste with general Municipal waste and they will be required to timely clean up of the infectious wastes.
- All healthcare service institutions including clinics will have to manage hazardous waste generated without adverse impacts to public health and environment. For this healthcare service institutions will have to install Incinerator, autoclave or any other appropriate technology of international standard. Healthcare institutions, which do not have such arrangement, will have to be linked to environmentally safe and sound disposal facility.
- All the personnel working in the field of healthcare waste management will have to undergo necessary trainings and orientations. They will have to be provided with the protective equipment and necessary vaccinations.
- All healthcare service institutions will be required to prepare management plan and implement the Reduce, Reuse, Recycle and Recovery principles.
- Research will be conducted on the effects and impacts of hazardous wastes on the human health and environment.
- Every healthcare institution must develop and maintain proper record keeping and reporting systems.
- Monitoring of all hospitals will be carried out by Ministry of Health and Population (MOHP) or its agency for assisting the hospitals and MOEST will have the responsibility of compliance monitoring

6.2.5 Agriculture Sector

- Pesticide use must be regulated and monitored under the pesticide act 1991 and Pesticide Rules, 1994.
- Awareness rising will be carried out more vigorously on the impacts of pesticides also through the use of mass media.
- Requiring proper recording and reporting
- Preventive approach will be enhanced for eliminating and or minimizing leftover of date expired pesticide
- Alternate less harmful pesticides and fertilizers will be promoted

- Use of pesticides will be minimized or optimized
- Proper and Safe packaging and labeling of pesticides
- Proper treatment and disposal of expired pesticides

6.2.6 Transport Sector

- Any transport agency will have to be registered and obtain permission from MOEST for the transportation of Hazardous Waste including the timing and routes
- The agency must employ and use safe and closed container for the transportation.
- The HW to be transported must be packaged well so that it does not contaminate natural environmental resources.
- The packaged HW must be labeled according to category or type of HW so that people can know about it.
- Waste handlers must be well-trained.
- The transport agency must prepare and submit regular reports
- Periodic Monitoring will be conducted by MOEST

7. Infrastructure Development

Physical Infrastructure for HWM must be created if such waste has to be treated and disposed in environmentally sound manner. Realizing that such infrastructure is costly, projects for such infrastructure will be approved after a study under PPP near to the important urban centers, where the HW generation is prominent.

MOEST, MOLD and Local Authority (DDC) will be involved from the side of the Government and invite the private sector to participate under PPP for the construction and operation of such facilities. Such facility will consist of HW testing facility, treatment facility and disposal site for treated waste. Guidelines will be prepared for the selection of site for such facility and its operation. The facilities will be established as industrial ventures in the industrial districts and the operation of such facility will be done by charging the HW generators. However, in the initial phase, technical and financial support of bilateral and multilateral development agencies will be channeled together with financial support from the government.

8. Research and Development

Research and Development will be promoted and encouraged in the following related areas:

- Identification and prioritization of HW

- Problem solving researches and adaptation research relating HWM technologies
- Universities will be supported on research and thesis grants on HWM.
- Inventory of suitable disposal approaches and methods for the priority waste in the country and their dissemination
- Inventory of low waste technologies
- Research on effective measures and actions

9. Incentive Management

With a view to enhance the compliance and proper management of HW, incentives will be given as given below:

- Government to subscribe 45 percent of the cost of treatment and disposal facility under Private or Public Private Partnership (PPP)
- Tax exemption for 20 years for treatment and disposal facility
- Financial support form Bilateral and Multilateral Agency will be channeled for such facility construction and operation
- Support from Environmental Protection Fund will also be available for such facilities.

10. Resource Allocation and Management

Resource is essential for proper management of HW.

- HW treatment and disposal sites will be constructed at least in five areas a period of five years and necessary resources from the side of the government will be allocated for such construction and operation
- Management of such resources will be channeled through the DDCs and capacity of DDC will be enhanced

11. Mobilization of Resources

Needed resources

- Resources will be mobilized through MOF, MOEST, MOLD, and related DDC.
- Fund from interested bilateral and multilateral agencies will also be mobilized.
- Technical assistance will also be mobilized for the design, construction and operation of the treatment and disposal facilities.

12. Human Resource Development

Realizing the importance of knowledge and skill needed for the proper management of HW,

Government of Nepal will promote necessary Human Resources Development. Hazardous Waste Management course will be promoted in all Environmental Engineering, Environmental Science, and Environmental management courses in the universities.

Professionals working in the field at the Ministries and related agencies will be given necessary training to play their role effectively. With a view to groom or prepare the future pillars and for wider dissemination to general public, HWM will also be introduced in the school curriculum.

Approved trainings on HW will be sponsored fully by MOEST for government officials and partially on the cost sharing basis for the private organizations and industries, hospitals, workshop

Training organizations will be supported by developing and provided training of trainers and channeling of cooperation from bilateral and multilateral agencies.

13. Institutional Arrangements

The proposed institutional arrangement for the management of HW in the country will be as given below:

A Department or an Agency like Pollution Control Board under MOEST will be created and given the responsibility within a period of two years. But in the mean time, MOEST will be strengthened with added allocation of human as well as financial resources. Environment Division of MOEST and particularly the Environmental Standards and Monitoring (ESM) Section will be the main responsible agency for the implementation of Hazardous Waste Management Policy. Technically qualified personnel to handle the issues on Hazardous waste will have to be inducted as Environmental Inspectors by new recruitment or by transfer from other Ministries. Other key agencies to be involved are

- Ministry of Local Development
- Ministry of Industry
- Ministry of Health and Population
- Ministry of Agriculture
- Related District Development Committee and Municipality

Besides, Ministry of Finance/Department of Customs, Ministry of Commerce and Supplies, and Ministry of Physical Planning and Works will also be invited as and when necessary.

Focal Point

The Environmental Standards and Monitoring Section of MOEST will be the focal point on Hazardous Waste management. It will register and issue permission to any unit as required by the policy document. Hazardous Waste Units will need to report to this section and this section has to study the submitted reports and give necessary directives for proper management of HW. This unit will also be conducting regular studies on HW and preparing the HW inventory.

The Technical Committee on Hazardous Waste

A Technical Committee on HW will be formed and this committee will work as an advisory body. The Technical Committee will have representation from important stakeholders as given below and the members of the committee must have the background of Science and technology:

- Senior Technical Officer, Ministry of Industry
- Public Health Administrator, Ministry of Health and Population
- Senior Technical Officer, Solid Waste Management & Resource Mobilization Center
- Representative, Environmental Engineering, University
- Representative, Pesticide Board, Ministry of Agriculture and Cooperatives
- Representative, Chemical Society
- Technical experts – 2 persons to be nominated by MOEST
- Chief, Environmental Standards & Monitoring (ESM) Section, MOEST – Member Secretary to the Committee

Technical difficulties or problems will be brought to this committee for resolution by the chief of the ESM Section. The Committee will be chaired by the Joint Secretary and Chief of Environment Division of MOEST.

Coordination

A high level committee on HW will be formed to coordinate the implementation of the policy under the Chair of the Minister of Environment, Science and Technology. The committee will be represented by:

- Secretary, Ministry of Environment, Science and Technology
- Secretary, National Planning Commission
- Secretary, Ministry of Industry

- Secretary, Ministry of Agriculture and Cooperatives
- Secretary, Ministry of Health and Population
- Secretary, Ministry of Local Development
- Representative Professor, University
- President of Consumer Society
- Community Leader to be nominated by Chair
- Representative, Municipality Association of Nepal (MUAN)
- Chief, KMC
- Professional Society/ Association – 2 Representatives to be nominated by MOEST
- President, FNCCI/ CNI
- Joint Secretary, MOEST – Member Secretary

As per requirement, other related officials may be invited in the meeting of the committee

A training center will be established and the existing training organizations relating to pollution control will be supported. Universities and existing training and consulting organization will be supported to conduct such trainings.

Concerned agencies or Ministries will be involved in the promotional aspects while the MOEST will focus on the compliance aspects. MOI, MOHP and MOLD along with DDCs will have to be strengthened for affecting hazardous waste management.

Monitoring

Hazardous Waste units involved in generation, transportation, recycling, treatment and disposal will be required to carry out self monitoring and reporting. Besides the Focal Point or the ESM section of MOEST will be responsible for the periodic monitoring of the HW units.

An action plan for such monitoring will be developed and this will be presented to the HW Technical Committee for suggestion and approval in principle. Trained Environmental Inspectors will be involved in such monitoring. Such monitoring will be limited to ensure proper operation and record keeping by HW units. In case of any complaints, it will be necessary to involve the accredited laboratories to take samples during the monitoring and to analyze the samples.

14. Legal Arrangement

The Environment Protection Act, 1997 already has the provision to formulate required regulation on Hazardous Waste. Rules and guidelines will be prepared and promulgated. Related organizations will be strengthened and their capacity will be enhanced to enforce the legislation strictly. MOEST will carry out regular monitoring of HWM.

ANNEX I: LIST OF HAZARDOUS WASTE

Waste streams:

1. Clinical wastes from medical care in hospitals, medical centers and clinics
2. Wastes from the production and preparation of pharmaceutical products
3. Waste pharmaceuticals, drugs and medicines
4. Wastes from the production, formulation and use of biocides and phytopharmaceuticals
5. Wastes from the manufacture, formulation and use of wood preserving chemicals
6. Wastes from the production, formulation and use of organic solvents
7. Wastes from heat treatment and tempering operations containing cyanides
8. Waste mineral oils unfit for their originally intended use
9. Waste oils/water, hydrocarbons/water mixtures, emulsions
10. Waste substances and articles containing or contaminated with polychlorinated biphenyls (PCBs) and/or polychlorinated terphenyls (PCTs) and/or polybromated biphenyls (PBBs)
11. Waste tarry residues arising from refining, distillation and any pyrolytic treatment
12. Wastes from production, formulation and use of inks, dyes, pigments, paints, lacquers, varnish
13. Wastes from production, formulation and use of resins, latex, plasticizers, glues/adhesives
14. Waste chemical substances arising from research and development or teaching activities which are not identified and/or are new and whose effects on man and/or the environment are not known
15. Wastes of an explosive nature not subject to other legislation
16. Wastes from production, formulation and use of photographic chemicals and processing materials
17. Wastes resulting from surface treatment of metals and plastics
18. Residues arising from industrial waste disposal operations

Wastes having as constituents:

19. Metal carbonyls
20. Beryllium compounds
21. Hexavalent chromium compounds
22. Copper compounds
23. Zinc compounds
24. Arsenic; arsenic compounds
25. Selenium; selenium compounds
26. Cadmium; cadmium compounds
27. Antimony; antimony compounds
28. Tellurium; tellurium compounds
29. Mercury; mercury compounds
30. Thallium; thallium compounds
31. Lead; lead compounds
32. Inorganic fluorine compounds excluding calcium fluoride
33. Inorganic cyanides
34. Acidic solutions or acids in solid form
35. Basic solutions or bases in solid form
36. Asbestos (dust and fibers)
37. Organic phosphorus compounds
38. Organic cyanides
39. Phenols; phenol compounds including chlorophenols
40. Ethers
41. Halogenated organic solvents
42. Organic solvents excluding halogenated solvents
43. Any congenor of polychlorinated dibenzo-furan
44. Any congenor of polychlorinated dibenzo-p-dioxin
45. Organohalogen compounds other than substances referred to in this Annex (e.g. 39, 41, 42, 43, 44)

ANNEX II: LIST OF HAZARDOUS CHARACTERISTICS

Characteristics

1 Explosive

An explosive substance or waste is a solid or liquid substance or waste (or mixture of substances or wastes) which is in itself capable by chemical reaction of producing gas at such a temperature and pressure and at such speed as to cause damage to the surroundings.

2 Flammable liquids

The word "flammable" has the same meaning as "inflammable." Flammable liquids are liquids, or mixtures of liquids, or liquids containing solids in solution or suspension (for example, paints, varnishes, lacquers, etc., but not including substances or wastes otherwise classified on account of their dangerous characteristics) which give off a flammable vapour at temperatures of not more than 60.5 C, closed-cup test, or not more than 65.6 C, open-cup test.

3 Flammable solids

Solids, or waste solids, other than those classed as explosives, which under conditions encountered in transport are readily combustible, or may cause or contribute to fire through friction.

4 Substances or wastes liable to spontaneous combustion

Substances or wastes which are liable to spontaneous heating under normal conditions encountered in transport, or to heating up on contact with air, and being then liable to catch fire.

5 Substances or wastes which, in contact with water emit flammable gases

Substances or wastes which, by interaction with water, are liable to become spontaneously flammable or to give off flammable gases in dangerous quantities

6 Oxidizing

Substances or wastes which, while in themselves not necessarily combustible, may, generally by yielding oxygen cause, or contribute to, the combustion of other materials.

7 Organic Peroxides

Organic substances or wastes which contain the bivalent-O-O- structure are thermally unstable substances which may undergo exothermic self-accelerating decomposition.

8 Poisonous (Acute)

Substances or wastes liable either to cause death or serious injury or to harm health if

swallowed or inhaled or by skin contact

9 Corrosives

Substances or wastes which, by chemical action, will cause severe damage when in contact with living tissue, or, in the case of leakage, will materially damage, or even destroy, other goods or the means of transport; they may also cause other hazards.

10 Liberation of toxic gases in contact with air or water

Substances or wastes which, by interaction with air or water, are liable to give off toxic gases in dangerous quantities

11 Toxic (Delayed or chronic)

Substances or wastes which, if they are inhaled or ingested or if they penetrate the skin, may involve delayed or chronic effects, including carcinogenicity

12 Ecotoxic

Substances or wastes which if released present or may present immediate or delayed adverse impacts to the environment by means of bioaccumulation and/or toxic effects upon biotic systems.

13 Capable, by means, after disposal, of yielding another material, e.g., leachate, which possesses any of the characteristics listed above.

Annex – 9: Institutional Arrangements

Final Draft

Institutional Arrangements for Hazardous Waste Management

Background

Human activities have contributed in the increased generation of wastes and as some of the wastes generated are hazardous in nature, Government of Nepal is desirous to manage such hazardous waste for minimization of adverse impact from such hazardous waste on public health and environment. For this, the government has in its national development policies and plans emphasized environmental considerations in all developmental activities.

Recently prepared inventory of Hazardous Waste shows that presently 12 sectors of industries, healthcare services and automobile workshops are generating significant amount of Hazardous Wastes and the amount of such waste is steadily increasing. It has also been seen that as of the date, there has been some efforts made by the government in terms of formulation of Environmental Protection Act, Environmental Protection Rules, and Effluent Standards for some sector of industries. With the assistance of some donor agencies, some efforts on promotion of cleaner Production and Environmental Management System have been carried out. However, there has been little monitoring and enforcement of the compliance with the promulgated standards.

Therefore, an assessment of the existing institutional set up for the management of waste in general and hazardous waste in particular has been carried out to come up with desirable institutional set up for the implementation of Hazardous Waste Management Policy in the country.

Existing Institutional Arrangement

Presently, functions relating to waste management have been undertaken mainly by:

- The Ministry of Local Development (MOLD) through Solid Waste Management and Resource Mobilization Center (SWMRMC) and Municipalities
- The Ministry of Physical Planning and Works, Department of Drinking Water Supply and Sewerage and agency under it for Sewage system and treatment.

Ministry of Environment, Science and Technology (MOEST), Ministry of Industry (MOI), Ministry of Health and Population (MOHP) have the mandate to oversee and monitor the management of wastes being generated.

Ministry of Environment, Science and Technology (MOEST)

MOEST has a Division looking after environment and another Division responsible for the Legal aspect. The organization chart of the Ministry is attached as Annex – A. Total number of professionals working for the environmental aspects in the Ministry is only nine. Among them, the Environmental Standards and Monitoring Section is the main responsible section for the management of waste including the Hazardous Waste. This section is lead by a Senior Chemist supported by one Mechanical Engineer and one chemist. The main functions being carried out by the section presently are:

- Air quality monitoring through involvement of consultants and contractors through outsourcing
- Implementation of some preventive approach such as Cleaner production, Energy Efficiency and Environmental Management Systems also through out sourcing
- Conducting studies for the formulation of environmental standards
- Giving permission to import old and used goods such as vehicles, scrap materials etc.

The Ministry does not have any Department or Agency for Environment. Environmental Inspectors as per the Environment Protection Act, 1997 and Environment Protection Rules, 1997 have not been appointed and hence Act, Rules and Standards formulated have neither been monitored regularly nor there has been any effort for enforcement to bring the concerned organizations to compliance with the Standards. There have been studies for the creation of Implementing Organization such as Environmental Protection Agency or Pollution Control Board. But the efforts have not materialized till date. The reasons given for this are relating to more pressing problem for the government other than environmental aspects in the country and lack of resources. Therefore, the organization of MOEST is too lean to carry

out the functions assigned even without the responsibility under the proposed Policy for the Hazardous Waste Management.

Ministry of Local Development (MOLD)

Ministry of Local Development (MOLD) has the function of guiding the development planning and management of the activities of the District Development Committees, Municipalities and Village Development Committees and these committees or the local authorities have the responsibility for the management of waste in their respective areas. Solid Waste Management and Resource Mobilization Center has been established at the central level since 1980 for regulating the municipal solid waste. Actually this center was initially under the Ministry of Housing and Physical Planning and later moved to MOLD. The organization Chart of MOLD is attached as Annex – B. Larger Municipalities with higher population and population density have created units that collect, transport and dispose solid waste. The local authorities have the mandate to manage the solid waste and for this they have the authority to charge fees. However, the municipalities are facing huge problem of public pressure and bargaining in the disposal site selection and operation. Not in my back yard (NIMBY) syndrome is high with the political involvement.

Ministry of Industry (MOI)

Ministry of Industry (MOI) has a Division for Environmental Aspects and the Departments under it are also geared for environmental aspects in the process of approval of IEE or EIA. Although mandated by the Environmental Protection Rules, 1997 to implement the Pollution Control Certification (PCC) and also the monitoring of industries, these functions have not been carried out effectively. The PCC function has been abandoned due to impracticable provision of completing the certification process for all the existing industries within 90 days from the date of promulgation of the Rules. Presently, monitoring for environmental aspects is only done for complaint handling. The departments also do not have enough human resources to carry out the regular monitoring. As the prime objective of the Ministry is to promote industrial development, enforcement of environmental legislation is seen as conflicting objective. Annex – C presents the organization structure of the Ministry for Environment.

Ministry of Health and Population (MOHP)

Ministry of Health and Population (MOHP) has the main function of providing basic health care for the Nepalese people. For this the Ministry has established small and large health care facilities all over the country. These facilities are administered by the Department of Health Services (DOHS). DOHS also take care of the administrative, logistic and training services; and it also issues permission to operate healthcare services to private sector. The organization structure of MOHP is given as Annex – D. Nepal Health Research Council (NHRC) has carried out research and prepared reports for the proper managements of Healthcare wastes. Hospitals have been required to have incineration facilities. However, most of these facilities are not operating or operating effectively and the healthcare wastes also land up in the Municipal Solid Waste (MSW).

Identified Gaps

There is no organization directly responsible for the management of Hazardous Waste in the country. MOEST has been mandated to manage also Hazardous Waste by the Environmental Protection Act, 1997. However, in the Environment Protection Rules, 1997 has assigned the monitoring functions to the Concerned Agency. By the definition of the Concerned Agency in the rules, the concerned agency is different for different aspects of activities; e.g. Ministry of Industry for industrial units, Ministry of Health and Population for Hospitals and Healthcare services; Ministry of Agriculture and Cooperatives for Pesticides and so on. MOEST does not have any Department or Agency for Environment and the related section of the Ministry i.e. Environmental Standards and Monitoring (ESM) section has only three officials for conducting activities to fulfill all the duties and responsibilities.

Solid Waste Management and Resource Mobilization Act gives the responsibility of management of waste to the local authorities – Municipalities and Village Development Committees. However, the act is being revised and the proposed revised act has the provision that the hazardous wastes from Industrial organizations, medical wastes from hospitals, other healthcare services and clinics have to be managed by the concerned organization themselves.

This shows that there is no organization working for management of HW in the country and the duties and responsibilities of the implementation of the proposed policy on HWM can not be added to existing organization without expanding them. It is strongly suggested that MOEST creates a Department or Pollution Control Board or Environmental Protection Authority for the implementation of the provisions of the Act, Regulation and proposed

regulation on Hazardous Waste after the adoption of the Policy being drafted.

The allocated resources both financial and human are also not at all sufficient for the monitoring and enforcement. It is extremely important to allocate the resources both human as well as financial for the implementation of any policy adopted. Otherwise, the policy will only be on the paper and will not be implemented at all. This is more detrimental than not having any policy as such. It will result in the suffering of the good and honest people as they will be abiding the policy provisions and the violators will enjoy the benefit.

Therefore, the government will need to create new institution and for this the best way will be to start recruitment of environmental inspectors under ESM section and these inspectors will be asset to be taken to the institution, once such institution is created.

The proposed institutional arrangement

MOEST will be the main responsible organization for the implementation of Hazardous Waste Management Policy. Other key agencies to be involved are:

- Ministry of Local Development
- Ministry of Industry
- Ministry of Health and Population
- Ministry of Agriculture
- District Development Committee – Municipality

Besides, Ministry of Finance/Department of Customs, Ministry of Commerce and Supplies, and Ministry of Physical Planning and Works will also be invited as and when necessary.

MOEST

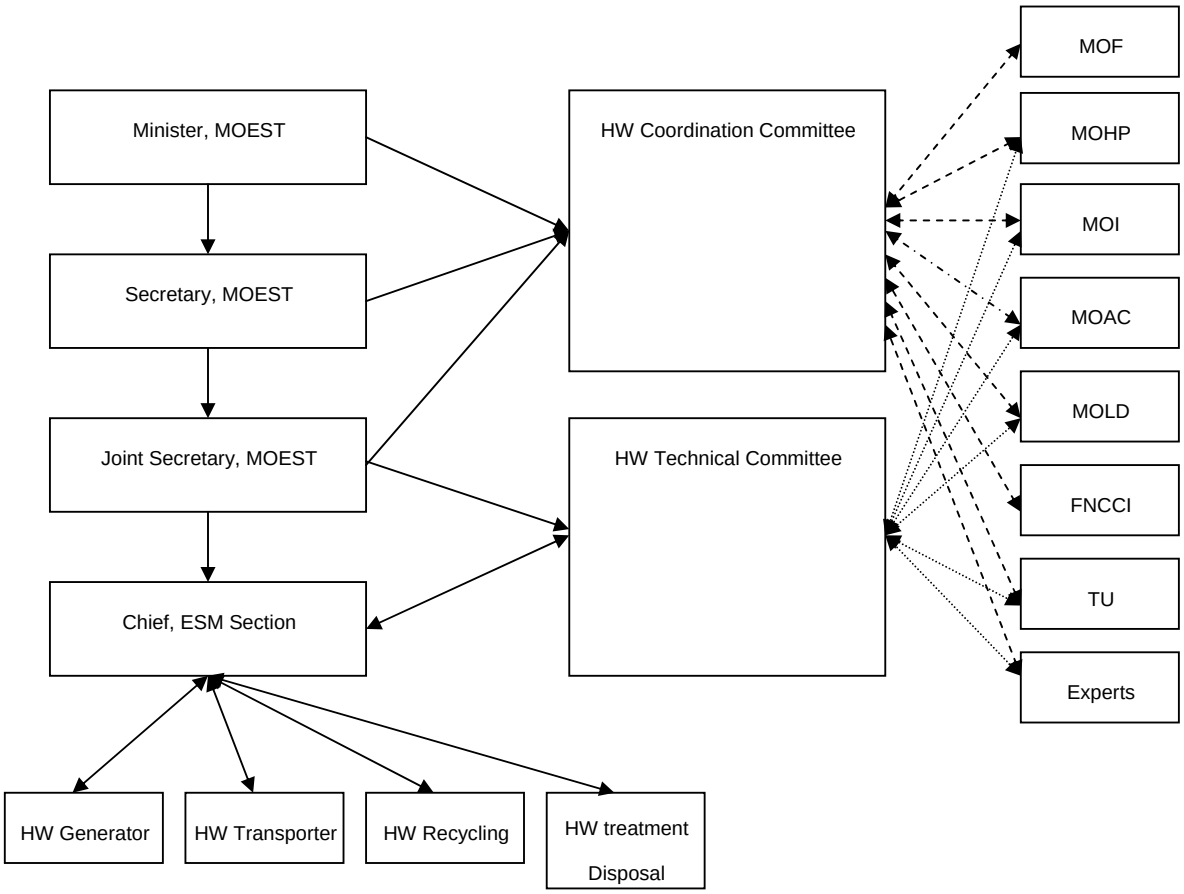
MOEST will be the lead agency. Upon creation of any department or Board under it, the new organization will be given all the responsibility of implementation. However as of now, MOEST will have to increase the strength of human resources to be able to implement the policies. Technically competent personnel to handle the issues on Hazardous waste will have to be inducted as Environmental Inspectors by new recruitment or by transfer from other Ministries.

Focal Point

The Environmental Standards and Monitoring Section of MOEST will be the focal point on Hazardous Waste. It will register and give permission to any unit as required by the policy document. The reports will be submitted to this section for study and to give directives for

proper management of HW. This unit will also be conducting regular studies on HW and preparing the HW inventory.

Institutional Arrangements for Hazardous Waste



Abbreviations in the Chart

ESM: Environmental Standards & Monitoring; FNCCI: Federation of Nepalese Chambers of Commerce & Industries; HW: Hazardous Waste; MOAC: Ministry of Agriculture & Cooperatives; MOEST: Ministry of Environment, Science & Technology; MOF: Ministry of Finance; MOHP: Ministry of Health & Population; MOI: Ministry of Industry; MOLD: Ministry of Local Development; TU: Tribhuvan University

The Technical Committee on Hazardous Waste

A Technical Committee on HW will be formed and this committee will work as an advisory body. The Technical Committee will have representation from important stakeholders and

the members of the committee will have the background of Science or technology as given below:

- Under Secretary (tech), Ministry of Industry
- Public Health Administrator, Ministry of Health and Population
- Technical Officer, Solid Waste Management & Resource Mobilization Center
- Representative, Environmental Engineering, IOE, Tribhuvan University
- Rep, Pesticide Board, Ministry of Agriculture and Cooperatives
- Technical experts – 2 persons to be invited
- Chief, Environmental Standards & Monitoring (ESM) Section, MOEST – Member Secretary to the Committee

Any technical difficulties will be brought to this committee for resolution by the chief of the ESM Section, who will also act as member secretary to the Technical Committee. The Chairperson for the Committee will be the Joint Secretary and Chief of Environment Division of MOEST.

Coordination

A high level committee on HW will be formed to coordinate the implementation of the policy under the Chair of the Minister of Environment, Science and Technology. The committee will be represented by:

- Secretary, Ministry of Environment, Science and Technology
- Secretary, National Planning Commission
- Secretary, Ministry of Industry
- Secretary, Ministry of Agriculture and Cooperatives
- Secretary, Ministry of Health and Population
- Secretary, Ministry of Local Development
- Representative Professor, University
- President of Consumer Society
- Community Leader to be nominated by Chair
- Representative, Municipalty Association of Nepal (MUAN)
- Chief, KMC
- Professional Society/ Association – 2 rep
- President, FNCCI/CNI
- Secretary, MOEST – member secretary

As per requirement, other related officials may be invited in the meeting of the committee

A training center will be established and the existing training organizations relating to pollution control will be supported. Universities and existing training and consulting organization will be supported to conduct such trainings.

Concerned agencies or Ministries will be involved in the promotional aspects while the MOEST will focus on the compliance aspects.

Support Functions

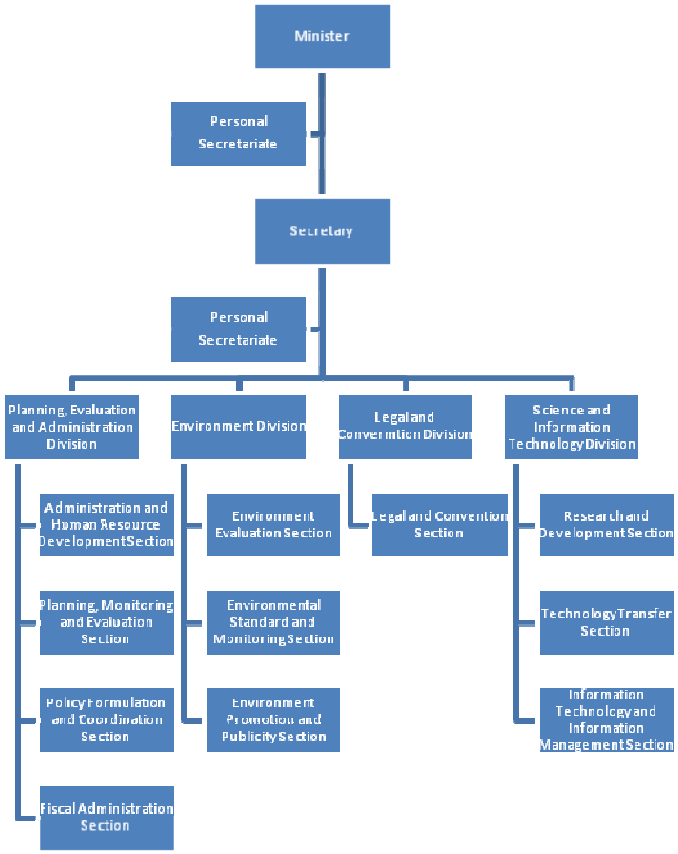
The support functions will be carried out by the concerned Ministries and Departments or agencies under the ministries. For example, MOI will be carrying out promotion of CP and EMS, which help elimination or minimization HW from the operation of the industries. MOHP will be promoting waste segregation and 3R principles for the minimization of the healthcare risk wastes. They will also need to enhance and build their organization for regular monitoring of the HW units.

Monitoring

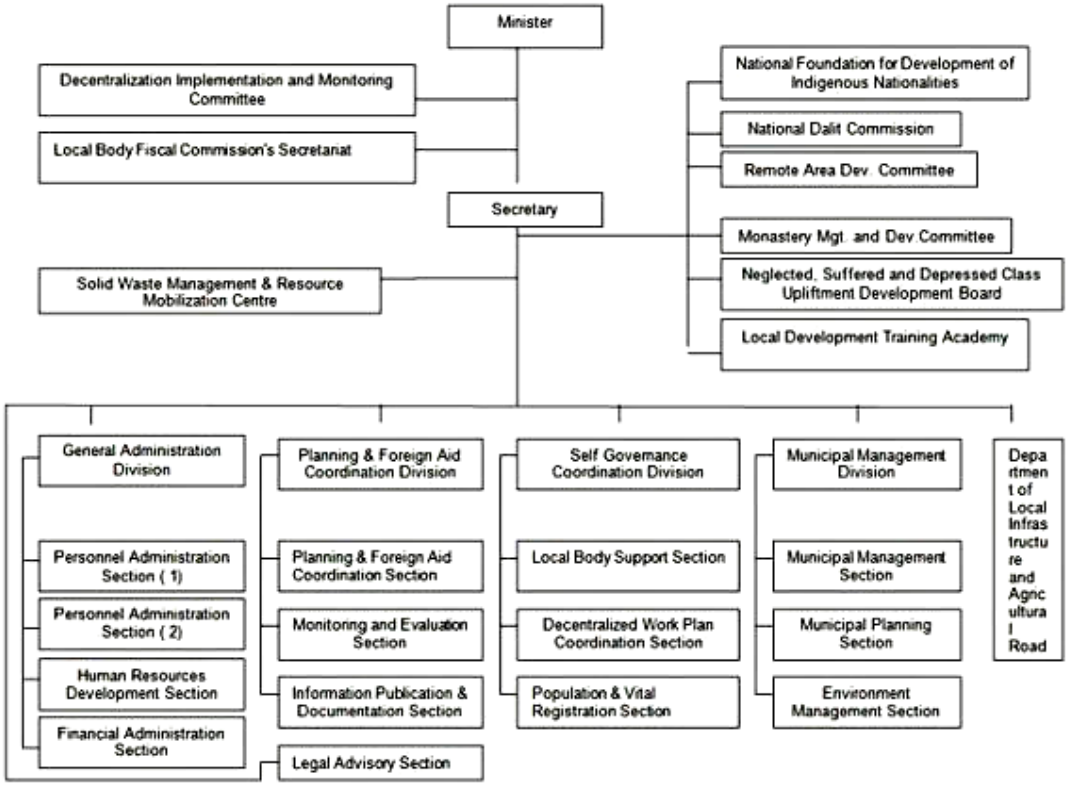
Besides the self monitoring and reporting from the HW units, Focal Point or the ESM of MOEST will be responsible for the periodic monitoring of the HW units. An action plan for such monitoring will be developed and this will be presented to the HW Technical Committee for suggestion and approval in principle. Trained Professional Environmental Inspectors will be involved in such monitoring. Such monitoring will be limited to ensure proper operation and record keeping by HW units.

In case of any complaints, it will be necessary to involve the accredited laboratories to take samples during the monitoring and to analyze the samples. The laboratories will be promoted in the private sector. As the industries and other HW units will be required to record and report, demand for services from private sector laboratories will tremendously increase and government will only need to provide the accreditation services.

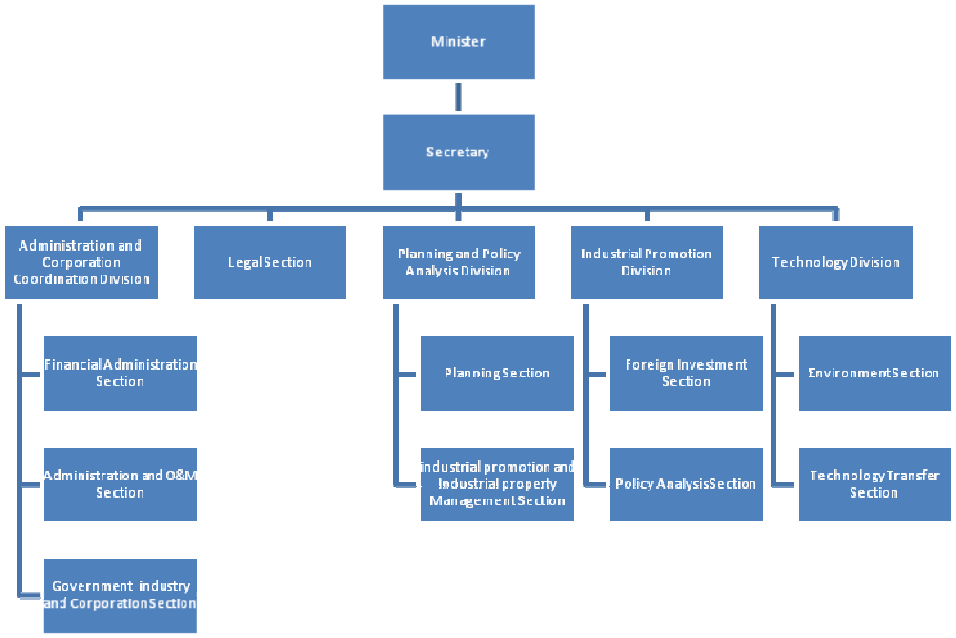
Annex – A: Organization Chart of the MOEST



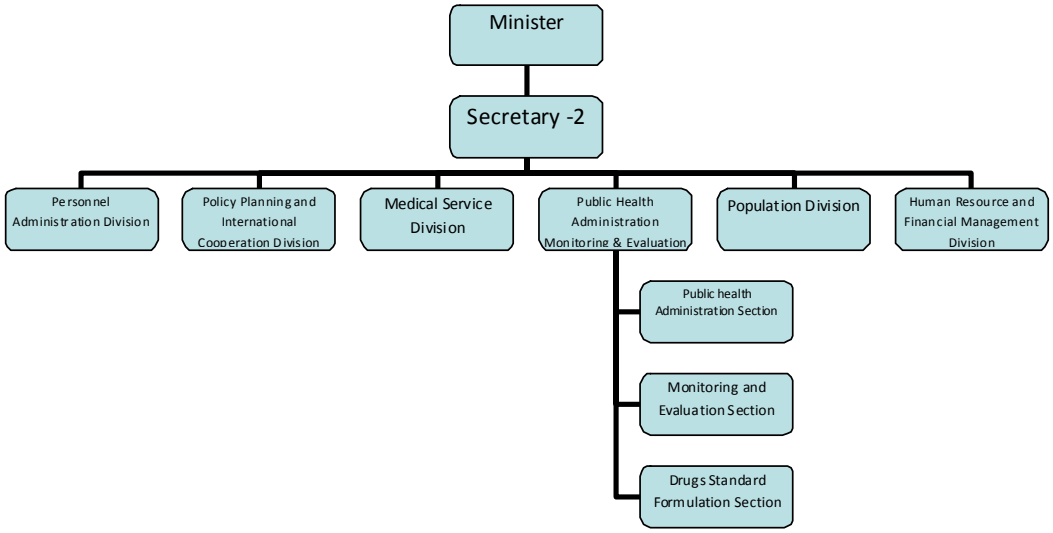
Annex – B: Organization Chart of Ministry of Local Development



Annex – C: Organization Chart of Ministry of Industry



Annex – D: Organization Chart of Ministry of Health and Population



Annex – 10: Training and Capacity Building Needs for HWM

Final Draft

Training and Capacity Building Needs for Hazardous Waste Management

Background

Hazardous wastes generated from different sectors in connection with manufacturing of goods or providing services are posing great threats to the human life and the environment all over the world and also in Nepal. In order to minimize the impact of the hazardous wastes, every country in the world is applying its best efforts with different programmes and activities. Although the issue of hazardous waste was not given adequate attention in Nepal in the past, it is realized that the issue of hazardous wastes should be well addressed in order to minimize their impacts and hence, initiations should be taken through appropriate policy, legislations and guidelines.

Ministry of Environment Science and Technology (MOEST) is the apex Government Agency responsible for the environmental issues in the country. Recently MOEST, as an implementing agency and with the assistance of Regional Technical Assistance (RETA) of Asian Development Bank (ADB), has completed the preparation of the inventory on the hazardous waste generation in the country as an initial activity with a focus on industrial sector, biomedical wastes from healthcare units and wastes generation from the automobile workshops.

As a follow up activity in the field of hazardous wastes, MOEST under the same project is in the process of preparation of a draft policy on hazardous wastes management in Nepal. For the implementation of the proposed policy, this document on training and capacity building needs has been prepared.

Nepal, being a developing country with significance of poverty and illiteracy; and in the initiation phase with regards to environmental policy implementation, training and capacity building of the involved organizations is essential. As the country has limited resources, such need must be properly assessed and thoroughly discussed among all stakeholders. Local capacity is essential for effective implementation of proposed policies.

Training Needs

The stakeholder list relating to the hazardous waste management has been presented in the Annex – a. These stakeholders can be categorized into the following headings:

a) Government Agencies
    i. Policy makers
    ii. Law Enforcing Agency - Environmental Inspectors / Pollution Control Board
    iii. Supporting Agencies -
b) Waste Generators
    i. Industrial
    ii. Hospitals
    iii. Auto Works
c) Municipal waste management units workers & Waste Transporters
d) Associations including FNCCI, CNI & NGOs
e) Service providers
    i. Environmental laboratories
    ii. Consultants
    iii. Trainers
f) Media
g) Universities, Research Organizations and Training Institutions
h) General Public
    i. Local Clubs
    ii. Students

Suggested trainings for the type or category of the stakeholders have been listed below:

a) Government Agencies
    i. Policy makers –
        - Awareness Seminars (One day)
        - exposure study visits
        - documentary shows
    ii. Law Enforcing Agency - Environmental Inspectors / Pollution Control Board –
        - Depth trainings both academic and practical trainings (One Month)
        - on-the-job trainings (One Month with expert trainer)
        - Exposure to good practices in other developing countries – study visits (One week)
        - Identification of HW for Custom and Commerce officials and – 2 days
    iii. Supporting Agencies –
        - Awareness Seminars (One day)
        - exposure study visits (up to one week)
        - documentary shows

b) Waste Generators
    i. Industries
        - sector specific short term trainings (one week) on HW for production managers and supervisors,
        - skill training for facility operators – treatment plant operators – 2 weeks,
        - Cleaner production and 3R trainings for Managers and supervisors (one week); and
        - awareness training (One day) for all workers
    ii. Hospitals –
        - CP, Waste segregation and 3R principles (one day) to all staff and Medical professionals
        - HW awareness to all staffs (one day)
        - Skill training (2 weeks) to Incinerator and other facility operators
    iii. Auto Works
        - Awareness training (one day) to all
        - CP and 3R principles (2 to 4 days) to supervisors

- Training on Pre-treatment operation (one week) - operators

c) Municipal waste management units workers & Waste Transporters
   - Awareness on HW and Transportation including identification and labeling – (One day)

d) Associations including FNCCI, CNI & NGOs
   - Awareness trainings – (2 days)
   - Awareness advocacy on HW – one day
   - Waste exchange possibility trainings

e) Service providers
   a. Environmental laboratories
      - HW sampling and analysis training – one week
   b. Consultants
      - Management of HW – one week

f) Media
   - Awareness training on HW – one day

g) Universities, Research Organizations and Training Institutions
   - Training or trainer on HW – One week

h) General Public
   a. Local Clubs
      - Awareness training – one day
   b. Students
      - Inclusion of HW in school curriculum

Once the policy will be implemented, problems being faced will be known and hence training needs will have to be assessed regularly and additional training will have to be conducted for effective implementation of the policy.

Capacity Building Need

At present, the capacity of the stakeholders with regards to hazardous waste management is almost non – existent. However, effluent standards have been formulated for some sectors of industries and although not on regular basis, sampling and laboratory test of effluents from industrial units have been carried out and studies have been conducted. The HWM Policy envisages creating an Agency like Pollution Control Board under MOEST. This institution after its creation will need to go through capacity building and on immediate basis the functions of this institution will be carried out by the expanded Environmental Standards and Monitoring (ESM) Section of the MOEST. Therefore, MOEST along with all the key players for the HWM will need to go through capacity building and enhancement process. This process will be positively supported by the proactive contribution of the educational sector as the universities in Nepal have already produced more than 1,500 graduates and 300 post graduates in the field of environmental science, engineering and management.

Capacity building needs of various key players have been presented below:

1. MOEST - at least 10 Environmental Inspectors will have to be recruited and trained. Provision of office equipment, vehicles and budget for monitoring and enforcement. Projects on CP, 3R, EMS, Safe disposal facility creation.
2. MOI - Creation of a cell in the Ministry or Department on HW from industries and for supporting the industries in implementing CP, EMS, pre-treatment and safe disposal of HW
3. MOHP - Creation of a cell in the Ministry or Department on Healthcare Risk Waste from healthcare facilities and for supporting the healthcare units to practice 3R, EMS, treatment and safe disposal
4. MOLD - Human resources, training, budget for HW treatment and disposal facility to be constructed at five regions.
5. Municipalities - Facility construction for segregation of HW from MSW
6. Industries - Segregation of HW, pre-treatment, Provision of Environmental Officer or In-charge, Implementation of CP and EMS
7. Hospitals - Segregation of HCRW, treatment, Provision of Environmental Officer or In-charge
8. Auto workshops - Segregation of HW, pre-treatment, Provision of Environmental

Officer or In-charge

9. DDCs - Environmental Cell creation
10. Custom Offices- Trained persons to identify HW
11. Department of Commerce – Trained person to process the application for the imports and export wastes

Financial Implications

Hazardous waste management is costly. But if it is not managed properly, the environmental resources will be polluted beyond use and adversely affect the health of the living creatures on the planet. Therefore, it is essential that steps must be initiated and hazardous waste is managed well. For the effective implementation of the proposed policy, organizations must be strengthened and human resources must be trained. Measures must be implemented and after the implementation of the preventive approaches; and implementation of 3R principles, treatment and environmentally sound disposal must be carried out and for this proper and safe disposal facilities needs to be established. For all these works, financial resources will need to be committed from the side of the Government. The estimation of the allocation for the first five years have been presented in the following table:

Amount in NPR '000

	Organization	Organization and Capacity Development					Total
		1	2	3	4	5	5 years
1	**MOEST**	1,500	3,000	6,000	6,000	6,000	**22,500**
2	**MOI**	500	1,000	2,000	2,000	2,000	**7,500**
3	**MOHP**	5,000	10,000	20,000	2,000	2,000	**39,000**
4	**MOLD**	3,000	6,000	12,000	12,000	12,000	**45,000**
5	**Customs**	250	500	1,000	1,000	1,000	**3,750**
6	**Commerce**	250	500	1,000	1,000	1,000	**3,750**
7	**Facility**	37,500	75,000	150,000	150,000	150,000	**562,500**
	Total	48,000	96,000	192,000	174,000	174,000	**684,000**

	Organization	Training					Total
		1	2	3	4	5	5 years
1	**MOEST**	250	500	1,000	1,000	1,000	**3,750**
2	**MOI**	125	250	500	500	500	**1,875**
3	**MOHP**	375	750	1,500	1,500	1,500	**5,625**
4	**MOLD**	250	500	1,000	1,000	1,000	**3,750**
5	**Customs**	50	100	200	200	200	**750**
6	**Commerce**	50	100	200	200	200	**750**
7	**Facility**	250	500	1,000	1,000	1,000	**3,750**
	Total	1,350	2,700	5,400	5,400	5,400	**20,250**
					Grand Total		**704,250**
					Amount In US$ @ NPR 80 per $		**8,803,125**

Annex – 11: Report of the Workshop on HWM

Report of Workshop
On
Hazardous Waste Management Policy

Submitted to:

Amar Bahadur Manandhar

(National Consultant)

Submitted By:

Durga Bahadur Karanjit

Gopal Krishna Shrestha

(Rapporteurs)

December 2008

Report of Workshop
On
Hazardous Waste Management Policy

The workshop was conducted as scheduled on 21st Dec, 2008 in Hotel Shanker, Lazimpath, Kathmandu. The programme was divided into two sessions viz Inaugural and Technical. The inaugural session was chaired by Mr. Laxman Prasad Mainali, Joint secretary, Ministry of Environment, Science and Technology. The chief guest was Mr Ganesh Sah, Minister for Environment, Science and Technology.



Figure 1: Inaugural Session of the Workshop

Welcome speech was made by Mr. Purushotam Ghimire, joint Secretary, Ministry of Environment, Science and Technology. In his welcome speech, he briefed about already completed hazardous waste Inventory study and the need of the formulation of Hazardous Waste management Policy and its formulation procedures.

Mr. Amar Bahadur Manandhar, National Consultant had highlighted on the importance of Hazardous Waste Management and its policy formulation. He had also briefed that the policy will be more practicable and implementable. The policy will be mainly based on three pronged principles namely preventive approach of 3R, Cleaner Production and Environmental Management System; information dissemination to general public for creating public pressure; and registration, standard setting and enforcement. He also added that policy has been formulated taking valuable guidelines and feedbacks form members of focal group of MoEST and Steering Committee. He also stressed the need for setting up organs to monitor and enforce the rules and standards.



Figure 2: View of the Workshop in Progress

The chief guest Mr. Ganesh Shah, Minister, MOEST in his key note address said that it is very important to give information to general public about adverse impact of hazardous waste and its management. He added that if hazardous waste producers or generators themselves take the responsibility of their disposal, there will be less adverse impact

to human health and environment. He emphasized on implementation of 3R principles and said that waste should be considered as a wealth. He has also suggested to promote waste based industries and predicted that person engaged in waste management and waste treatment will be respectful person in the society. He gave some examples as making biogas from kitchen waste and electricity generation from the waste generated in sugar mills. He suggested that there should be hard punishment system for those who violets the rules knowingly. He also emphasized on the need of establishment of companies in the country that look after waste treatment and its safe disposal and said that now country need specialized people and specialized work but not general. He concluded saying that the country need very practicable HWM policy and requested to all participants to cooperate for creative comments in formulating very good and practicable policy.



Figure 3: Hon'ble Minister Mr. Ganesh Shah addressing the Workshop

In the closing remark, Mr. Laxman Prasad Mainali, chairperson of the programme said that hazardous waste and municipality waste should be segregated and treated separately and this should be incorporated in the policy. HWM policy should be compatible with Basel Convention and it also should address environmental related rules/regulation and other policy.



Figure 4: Joint Secretary Mr. L. Mainali addressing from the Chair

At the end of the inaugural programme, Mr. Ramesh Sthapit, Senior Divisional Chemist, MOEST gave vote of thanks.

Mr. Govinda Tiwari, Director PACE Nepal, was Master of Ceremony of the proramme.

The details of the programme are attached as Annex -1 and list of participants as Annex-2.

Technical Session:

Technical session was organized mainly for presentation by consultants, group formation and group work on draft policy, group presentation and general discussion.

There were two presentations. First presentation on Results of Hazardous Waste Survey was made by Mr. Govinda Tiwari, National Consultant. As it was already finalized by MOEST, there was no such discussion and comments. It was just for information to all participants.



Figure 5: Mr. Tiwari presenting on Hazardous Waste Inventory & Mr. Ghimire Chairing the Session

Second presentation on Hazardous Waste Management Policy was made by Mr. Amar Bahadur Manandhar, Narional Consultant. The presentation was made in power point and divided into one plus four lines viz General and Policy Formulation, Consultation Methodology, Institutional Arrangements for Hazardous Waste Management and Training and Capacity Building needs for Hazardous Waste Management. They are as follows:

A.General

1. Background
2. Rationale
3. Hazardous waste Definition
4. Vision
5. Objectives
6. Policies
7. Strategies
8. Implementation policies



Figure 6: Mr. Manandhar presenting the draft policy & Mr. Ghimire chairing the Session

B. Sector specific

1. Industry Sector
2. Trade Sector
3. Service Sector
4. Healthcare Sector
5. Agriculture Sector
6. Transport Sector

C. Consultation Methodology

D. Institutional Arrangements for Hazardous Waste Management

1. Infrastructure Development
2. R & D
3. Incentive Management
4. Resources
5. Institutional Arrangement
6. Technical Committee
7. Coordination Committee
8. Monitoring
9. Legal Arrangement

E. Training and Capacity Building needs for Hazardous Waste Management

1. Human Resource Development
2. Training Need
3. Capacity Building Need

General Discussion

Immediately after presentation, the floor was opened for general discussion. Ms Sharda Pandy, Ministry of Health and Population asked to make clear why bed with more than 25 beds needs to install incinerator.

Mr. Amar Bahadur Manandhar made clear that the provision of incinerator for healthcare facilities was based on the IEE/EIA requirement.

Mr. Bhupendra Devkota, consultant, MoEST commented that it would be waste of fund providing grants of 4 – 5 lakhs of rupees to every medical institutions for installation of incinerator. It would be better to install one common incinerator for small medical institutions for handling of HW management.

Mr. Megh Nath Dhimal, NHRC, argued that it should be the responsibility of healthcare facility to manage the hazardous waste although they do not have proper facilities for that.. Some healthcare facilities have incinerator, but they are not operated properly and regularly. He emphasized that the final disposal should be monitored by MoEST itself. Policy should be focused more on final disposal method and strategy. Without final disposal method, policy will be incomplete. He suggests taking approach of 4R or even 5R instead of 3R suggested by present draft policy.

Ms. Meera joshi, MoEST asked the causes of not operation of incinerator of Koshi Hospital although EIA study had been performed for the operation of that hospital. Requirement of EIA for healthcare facilities with more than 100 beds was made due to increase of small healthcare facilities (nursing homes) in the country.

Mr. Rabindra Rai, Kathmandu Municipality confessed that the incinerator at Teku, Kathmandu Municipality couldnot be operated due to public pressure. But no body knows about non operation of incinerator at Koshi Hospital. He questioned the applicability of 3R principles in hospital waste.

Ms. Sushma Upadhyaya, Department of Mines and Geology suggested to incorporate Pathology and chemical laboratory sector in policy.

Mr. M. P. Bhatta, Kathmandu University commented that complete data on hazardous waste is not available. We are not even able to handle the solid waste management successfully. In this context, he asked how it would be possible to manage hazardous waste. He suggested to have complete inventory research in this field and the policy should be more practicable and implementable.

Mr. Rishi Koirala, Department of Industry commented that prevailing environmental act and regulation already contents provision that could be regulated hazardous wastes although there is no definition of HW and asked the justification for need of such policy formulation. Even we have not been able to implement the existing rules and regulation, what the rationale behind this policy is. He commented that the need of this policy formulation would be mainly due to Basel Convention. So, this policy should be integrated other act and regulations as well.

Mr. Bhupendra Devkota, Consultant, MoEST made clear that regulation on hazardous waste had already been drafted. Many rule/regulations and guidelines have been formulated, But their enforcement has been very poor. We worked without coordination. He suspected that there has some duplication of works. He suggested that work should be done with coordination of all concerned organizations and people involved. He also suggested incorporating laboratory waste also in hazardous waste within this policy. He advises to follow the policy of standard centralized incinerator. He commented also on administrative management of MoEST that the ministry could not work efficiently and effectively. Nobody in the ministry takes responsibility. He put questions as why incinerators has installed in densely populated area like Teku. A coordinating body should be developed to look after all these issues. He added that due to less accountability to planning and implementation as there\has been frequent transfer of technical man power. Technical man power should not be transferred to not related field.

Mr Bijay Baidya, Makwanpur Chamber of Commerce and Industry asked about 12 sectors of industries listed in the study HW inventory. He also asked to incorporate sludge generated from oil pumps and inventory data should be on the basis of percentage of capacity utilization. He also suggested incorporating all data from small nursing homes scattered all over the country and there should be system to dissemination of information to all general people through DDC, CDO and factory inspectors.

Mr. Bhairaja Manandhar, MOEST made last comment. He says that implementation would not be easy but it would be very serious. We have not been able to implement even small and simple matters related to environment and pollution. All weakness and problems faced from such implementation should be incorporated in that draft policy and if not, then policy would not have any meaning.

Mr. Purushotam Ghimire, Joint Secretary, MoEST, made comments informing the need and causes of formulating this policy. He gave emphases that the need of formulation of such policy is to give continuation and implementation of matters specified in Hazardous Waste Inventory and there were suggestions for formulating such a draft policy. He also cleared the

scope of this workshop. He has requested to all participants to finalize the presented draft policy giving valuable and creative suggestions and comments and he concluded this session giving thanks to all participants and requested all for lunch.

Group Works:

All participants were divided into four groups as follows:

Group 1: Industry Sector
Group 2: Healthcare Sector
Group 3: Trade and Service Sector
Group 4: Transport and Agriculture Sector

Each group consisted of 6-7 persons related to identify sector. The assignment given to groups was to comments on the draft policy presented with positive feedbacks and suggestions. Each group had to work on the assigned sector as stated and following common areas

1. Institutional Setup
2. Training and Capacity Building

Time allocated for group work was one hour. Group work was started immediately after lunch. Draft policy was distributed to all participants 3-4 days prior to the workshop day so that they had gone through the policy before coming to workshop. Each group with involvement of all group members worked very hard and they made very creative and useful comments and feedbacks.

Presentation of Group Works:

The presentations were made using flip charts. The group leader from each group had presented their outcomes with comments and feedbacks as stated below:

Group 1: <u>Industry Sector</u>

1. Hazardous waste should be included in IEE and EIA requirement in Annex -5 and 6 of EPR 1997.
2. There should be separate industrial zoning especially for hazardous waste generating industries. They should be established in cluster. It makes easy to monitor and inspection.
3. WWTP constructed in HID is not working properly. Its utilization is not more that 10%. So its usefulness and operation is question mark.
4. To take approach of 5R instead of 3R as stated in Draft policy. R-



Figure 7: Group work for Industry Sector in Progress

Regeneration and R-Research should be added

5. There should be clear-cut demarcation of authority of standard formulation and implementation and who is going to monitor(MOEST/MOI/MOLD)
6. Self monitoring system should be given emphases.
7. The following aspects should be clearly written.
    - List of Designated Laboratory
    - Enforcement type and its authority
    - Incentives provision and its implementation procedures.
8. Now the industries have been facing the problem of Pollution Control Certification. The provision in EPR/EPA should be amended. Provisional certificated should be awarded first.
9. The provision of Incentives to be given to industries engaged in Reduction/Reuse/Recycling/Regeneration/Research activities should be added.
10. Pollution Control Inspectors should be nominated and deputed to the field.
11. May be private entrepreneurs only should be involved instead of PPP approach.
12. Representation from local bodies like DDC, CDO, chambers should be in Steering Committee
13. May be Trade Unions also should be incorporated in the policy.
14. Awareness and training programme about Hazardous Waste should be conducted for local bodies like DDC, CDO, chambers, Municipalities
15. Role of MOI and chambers should be promotional and MOEST for enforcement and regulatory.
16. Training Center should be established.
17. Environment committee should be chaired by Minister from MoEST and Secretaries from different ministries should be members

Group 2: <u>Healthcare Sector</u>

1. One environment unit under Healthcare Waste Management Committee, formed under the chairmanship of chief of the organization should be established in all Healthcare Service providers. The organization and TOR of this committee should be according to National Healthcare Waste Management Guidelines.
2. All hospital waste generated from Healthcare Facilities should be segregated hazardous and non hazardous waste at source itself.
3. All Healthcare Service Providers should be managed hazardous waste without any adverse impact to human health and environment. Incinerator or autoclave of international standard has to be installed to manage such waste.



Figure 8: Group work for Healthcare Sector in Progress

Healthcare providers without such facilities should be used the service from the organization having such facilities.

4. An appropriate training on waste management should be organized for employees involved in healthcare waste.
5. All Healthcare Service Providers should be implemented 4R principles (Reduction, Reuse, Recycle and Recovery) through making management planning.
6. Orientation type training programme on the use of vaccination and personnel protective equipment should be conducted for employees involved in healthcare waste management. And require vaccination and ersonnel protective equipment should be made available to all employee involved in such waste management.
7. A research work should be conducted about adverse impact on human health and environment.
8. All Healthcare Service providers should develop and maintain an appropriate report keeping and reporting system.
9. Ministry of Health and Population would monitor healthcare waste management system in all healthcare service providers.
10. Monitoring and penalizing against noncompliance of HW rregulation should be done by MoEST.

Mr. Amar Bahadur Manandhar had added that the responsibility of department would be promotional and compliance monitoring inspection should be done by MOEST itself. The Mr. Devkota added that although monitoring authority has given to MOEST, MOHP should monitor the compliance.

Group 3: <u>Trade and Service Sector</u>

1. Hazardous waste should be banned for import
2. Export of hazardous waste should be according to international rules and conventions of Nepal party
3. There should be list of hazardous waste for custom purpose in international borders.
4. Training and orientation programme on handling and sampling of hazardous waste should be organized for the staffs of custom.
5. One regional environmental laboratory approach instead of many local laboratories should be adopted.



Figure 9: Group work for Trade & Service Sector in Progress

6. Wide awareness programme on HW and its impacts on human being for exporters/importers and general public should be organized in all regions.

7. The concept of Cleaner Production and Energy Efficiency should be incorporated in Hazardous Waste Management programme.
8. The hazardous waste course should be included as basic knowledge in university and school curriculums
9. Environmental Management System should be promoted in service sector too.
10. Knowledge on hazardous waste should be given to all employees of service sector. Guideline on Hazardous waste should be prepared and enacted.
11. Mechanism of segregation and disposal of hazardous waste should be developed under PPP
12. Laboratory should be put under service sector of HWM policy and the hazardous waste management should be implemented compulsory

There are some comments and addition:

Mr. Devkota suggested that the disposal mechanism for POP should be immediately developed. And Policy makers should be aware about hazardous waste. Mr. Amar Manandhar had said that there should be take back system for import of hazardous waste.

Group 4: <u>Transport and Agriculture Sector</u>

1. Alternative source should be searched for chemical fertilizers.
2. Minimization approach on the use of chemical fertilizers should be adopted
3. Awareness programme should be conducted on the use of pesticide and chemical fertilizers and adverse impact from them for farmers and other users.
4. Chemicals should be properly packed and leveled.
5. Closed vehicle should be used for transportation of hazardous waste.
6. Waste handlers should be well trained and PPE should be used during handling of hazardous waste.
7. Hazardous waste should be identified properly and leveled accordingly.
8. Transportation route and timing should be chosen so that its adverse impact during transportation would be minimized.
9. Monitoring of transport facilities for HW should be done regularly and effectively
10. Treatment and disposal of hazardous waste should be managed properly.
11. Authority to local bodies should be disseminated for proper management of hazardous waste.
12. Technical committee should incorporate following organizations as members
    a. Nepal Chemical Society
    b. Nepal Engineering Association
    c. Universities
13. Coordination Committee



Figure 10: Group work for Transportation & Agriculture Sector in progress

should incorporate the following personnels and organizations:

a. Two members form community leaders nominated by chairperson
b. President of the consumers society
c. Nepal Municipality association
d. Executive officer – KMC

14. Need of capacity building for the following organizations
    a. Laboratories
    b. Scrap collectors
    c. Technical institution/universities



Figure 11: Presenting the group work by Mr. Vaidya

Comments and additions:

Mr. Devkota had commented that Optimum use of chemical fertilizer instead of minimum would be more appropriate.

Mr. Sharma said that Ministry of Forest also should be incorporated in coordination committee. Now-a-days organic farming has got great importance. Radiation, air pollution also should be incorporated in the policy

Mr. Amar Manandhar made clear that radioactive waste need to be managed separately. It does not come under hazardous waste definition.

Lastly, Chairperson of the session Mr. Ghimire had concluded the group work session with the following remarks:

All suggestions and comments from all groups and participants would be looked very seriously and positively and would be incorporated in the draft policy accordingly before

submission to Steering Committee. Then it would be submitted to Steering Committee for finalization and if required, one more workshop could be organized. Policy would be finalized only after having comments and suggestions from related ministries.

Lastly, he made closing remarks giving thanks to all participants for their active participation and valuable suggestions and feedbacks.

Annex - 1

Government of Nepal

Ministry of Environment, Science & Technology (MOEST)

ADB RETA 6361: Managing Hazardous Waste

WORKSHOP PROGRAMME ON HAZARDOUS WASTE MANAGEMENT POLICY

Date: 21 December 2008 Venue: Hotel Shanker, Lazimpat

Session	Time	Topic
	09:00: 09:30	*Arrival & Registration*
	09:30 – 09:45	Brief Introduction of Participants
Session 1: Inaugural Session	09:45 -10:30	Inaugural Session Chairing: Mr. Laxman P. Mainali, Joint Secretary, MOEST Chief Guest: Mr. Ganesh Shah, Hon. Minister for EST Welcome Speech: Mr. P. Ghimire, Joint Secretary, MOEST Remarks: Mr. A. B. Manandhar, National Consultant Inauguration and Address: Chief Guest Closing Remarks: Chairperson Vote of Thanks: Mr. R. Sthapit, Chief, ESM Section
	10:30 - 11:00	*Tea Break*
Session 2: Presentation Session	11:00 – 12:00	Presentation on: Results of Hazardous Waste Survey: Mr. G. Tiwari Draft Policy on Hazardous Waste Management; Institutional Set up (IS); and Training and Capacity Building Need (TCBN): Mr. ABM
	12:00 – 12:45	Discussion Question and Answers
	12:45 – 13:45	*Lunch Break*
Session 3: Group Session	13:45 – 15:00	Group Division & Group Work on Draft Policy Group Themes: Group 1: Industry Sector Group 2: Health Sector Group 3: Trade and Service Sector Group 4: Transport and Agriculture Sector
	15:00 – 15:30	*Tea Break*
Session 4: Presentation of Group Work	15:30 – 17:00	Chairing: Mr. P. Ghimire, Joint Secretary, MOEST Presentation of Group Works Group 1 Group 2 Group 3 Group 4 Discussion Concluding Remarks By Chair

.MC: Mr. Govinda Tiwari, Director, PACE Nepal

Annex - 2

Ministry of Environment, Science & Technology (MOEST)

RETA 6361 (REG) - Managing Hazardous Waste - S16762: Draft Policy

Attendance of the Participants

Date: 21-Dec-08 Venue: Hotel Shanker

S. No.	Name	Position	Organization	Contact No.	Signature	Email address
1	Ritu PANTHA	Stat. officer	MOEST	4211637		
2	Bijay Vaidya	EHS MANAGER CSI Nepal	MCC2 / MAK [illegible]	9845123343		Bijay.Vaidya@csic[illegible]
3	M. L. Sharma	Lecturer	Tribhuvan Campus, T.U	9841120175		mlsharma100@hotmail.com
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5	Suman Sharma	Head-Business Banking	NMB	9851014975		
6	Nilala chitrakar	House Keeping officer	T.U. T.H.	9841634400		
7	Laxman Paiwali	Joint Secretary	MOEST	9851105885		
8	Purushottam Ghimire	Joint Secretary	MOEST	4211586		Puru@most.gov.np
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17	Ganesh Shah	MINISTER	MOEST	9851079522	Ganesh	
18	Meera Joshi	MoE Under Secretary	MoES	9741055055		meera04478952@yahoo.com
19	Ramindra Lal Rai	Engineer	Kathmandu Metro City	9851049018		[illegible]@gmail.com

Ministry of Environment, Science & Technology (MOEST)

RETA 6361 (REG) - Managing Hazardous Waste - S16762: Draft Policy

Attendance of the Participants

Date: 21-Dec-08 **Venue: Hotel Shanker**

S. No.	Name	Position	Organization	Contact No.	Signature	Email address
20	Suresh Shrestha	Mech. Engineer	Ministry of Labour	9841336773		saradaksur@gmail.com
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22	Meghnath Dhimal	Environmental Health Officer	NMRC	9841467883		meghdhimal@yahoo.co
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24	Gangam Prasain	Reporter	The Rising Nepal	9841466900		
25	Durga B. Kamaiya	Director	PACE Nepal	9851009316		dbratnajit@yahoo.com
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27	Rita Shrestha	S.D. Chemist	WIST	9841266666		rita.shrestha@hotmail
28	Rajesh Dahal	Reporter	Himkhupura	9841544518		
29	~~Attended~~					
30	SANJAY GIRI	FNCCI	FNCCI	9851071861		girisanjay@wlink.com.np
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Ministry of Environment, Science & Technology (MOEST)

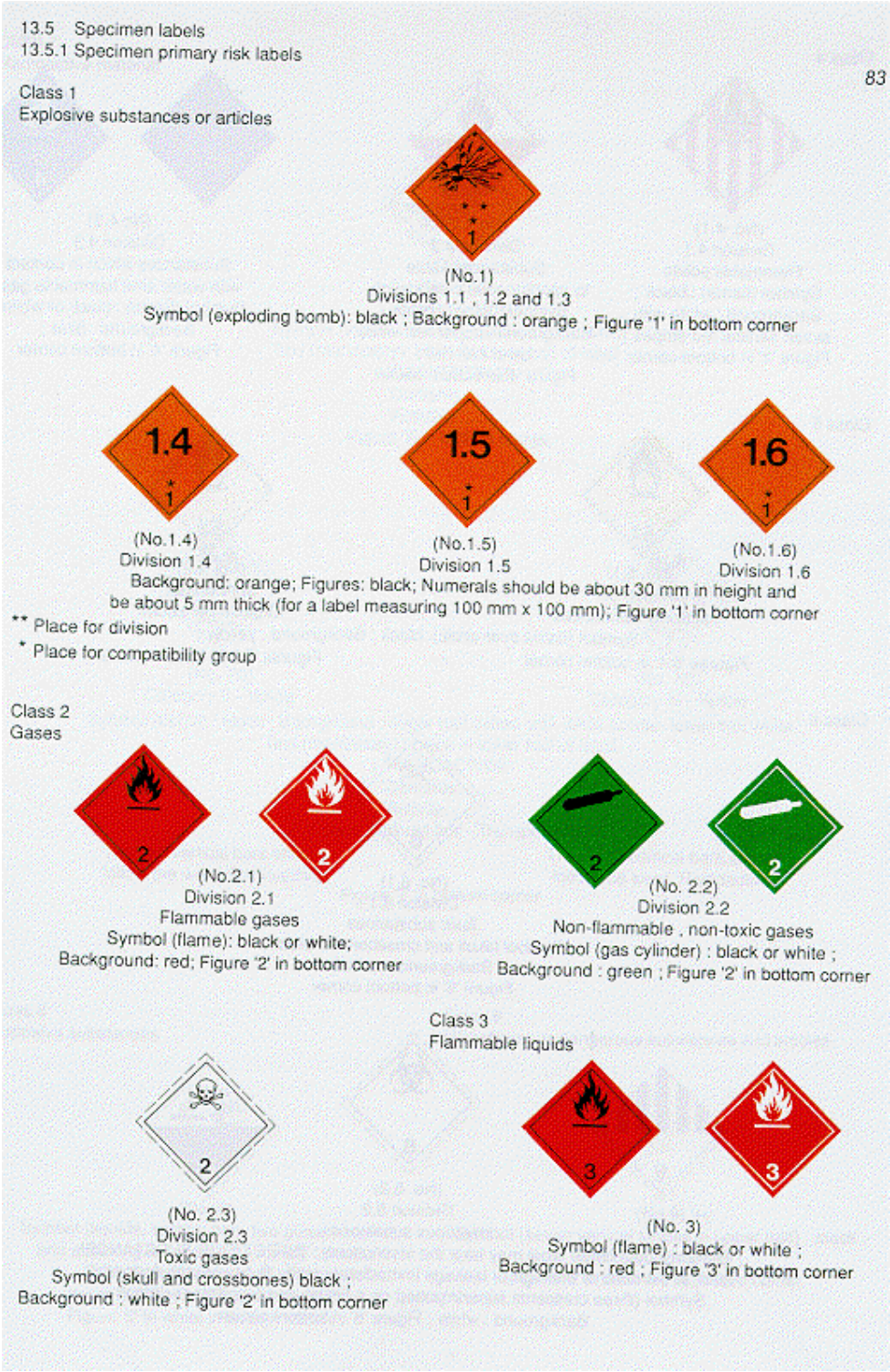
RETA 6361 (REG) - Managing Hazardous Waste - S16762: Draft Policy

Attendance of the Participants

Date: 21-Dec-08 Venue: Hotel Shanker

S. No.	Name	Position	Organization	Contact No.	Signature	Email address
39	Nawa Raj Shakya	Ex President	National Chamber	9852000814		bccl@nec.com.np
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Appendix – I: UN Hazard Label and Placards



13.5 Specimen labels
13.5.1 Specimen primary risk labels

83

Class 1
Explosive substances or articles

(No.1)
Divisions 1.1 , 1.2 and 1.3
Symbol (exploding bomb): black ; Background : orange ; Figure '1' in bottom corner

(No.1.4)
Division 1.4

(No.1.5)
Division 1.5

(No.1.6)
Division 1.6

Background: orange; Figures: black; Numerals should be about 30 mm in height and be about 5 mm thick (for a label measuring 100 mm x 100 mm); Figure '1' in bottom corner

** Place for division
* Place for compatibility group

Class 2
Gases

(No.2.1)
Division 2.1
Flammable gases
Symbol (flame): black or white;
Background: red; Figure '2' in bottom corner

(No. 2.2)
Division 2.2
Non-flammable , non-toxic gases
Symbol (gas cylinder) : black or white ;
Background : green ; Figure '2' in bottom corner

Class 3
Flammable liquids

(No. 2.3)
Division 2.3
Toxic gases
Symbol (skull and crossbones) black ;
Background : white ; Figure '2' in bottom corner

(No. 3)
Symbol (flame) : black or white ;
Background : red ; Figure '3' in bottom corner

Class 7
Radioactive material

85



(No. 7A)
Category I - White
Symbol (trefoil) : black ; Background : white
Text (mandatory): black in lower half of label :
'RADIOACTIVE'
'Contents.....'
'Activity.....'
Figure '7' in bottom corner



(No. 7B)
Category II - Yellow



(No. 7C)
Category III - Yellow

Symbol (trefoil) : black ; Background : upper half yellow with white border, lower half white ;
Text (mandatory) : black in lower half of label :
'RADIOACTIVE'
'Contents.....'
'Activity.....'
In a black outlined box -'Transport Index'

Two red vertical bars should follow the word 'Radioactive';

Three red vertical bars should follow the word 'Radioactive';

Figure '7' in bottom corner

Class 8
Corrosive substances



(No. 8)
Symbol (liquids, spilling from two glass vessels and attacking a hand and a metal) : black ;
Background : upper half white,
lower half black with white border ;
Figure '8' in white in bottom corner

Class 9
Miscellaneous dangerous substances and articles



(No.9)
Symbol (seven vertical stripes in upper half) : black ;
Background : white ;
Figure '9' underlined in bottom corner

Class 4 *84*



(No. 4.1)
Division 4.1
Flammable solids
Symbol (flame) : black ;
Background : white with seven vertical red stripes ;
Figure '4' in bottom corner



(No 4.2)
Division 4.2
Substances liable to spontaneous combustion
Symbol (flame) : black ;
Background : upper half white, lower half red ;
Figure '4' in bottom corner



(No 4.3)
Division 4.3
Substances which in contact with water emit flammable gas
Symbol (flame) : black or white ;
Background : blue ;
Figure '4' in bottom corner

Class 5



(No. 5.1)
Division 5.1
Oxidizing substances



(No. 5.2)
Division 5.2
Organic peroxides

Symbol (flame over circle) : black ; Background : yellow ;
Figures '5.1' in bottom corner
Figures '5.2' in bottom corner

Class 6



(No. 6.1)
Division 6.1
Toxic substances
Symbol (skull and crossbones): black ;
Background : white ;
Figure '6' in bottom corner



(No. 6.2)
Division 6.2
Infectious substances
The lower half of the label may bear the inscriptions : 'INFECTIOUS SUBSTANCE' and 'In the case of damage or leakage immediately notify Public Health Authority';
Symbol (three crescents superimposed on a circle) and inscriptions : black ;
Background : white ; Figure '6' in bottom corner