

National Asbestos Profile of Nepal

(Based on the National Asbestos Profile by ILO and the WHO)



October 2016

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Preface

It was late November 25, 2013, just about two weeks after 6th Asian Asbestos Initiative (AAI 6), a truck piles of Asbestos waste were about to be buried at the cross road junction of Maitighar Mandala, capital city of Kathmandu, one of the busiest cross roads and in close proximity of Health Ministry, Environment Ministries, Prime Ministers and other governmental offices. This unscientific disposal of hazardous asbestos waste was duly informed by CEPHED to all concerned government offices with the request to immediately remove and ensure environmentally sound management of these wastes. The Environment Ministry immediately acted upon and directed its Department of Environment to clean up the mess. The Department did so, but the collected wastes were just relocated from this busy place to one of the temporary waste transfer stations at Teku, Kathmandu, from where these toxic wastes were disposed unscientifically along with the city garbage. But just after a year, on **22 December 2014, Government of Nepal banned the Import, Sale, Distribution and Uses of all forms of Asbestos.**

Nepal is the first country in South Asia to ban Import, Sale, Distribution & Uses of Asbestos. National blanket ban of Import, Sale, Distribution and Uses of all forms of Asbestos (Corrugated / Non-corrugated Sheet, Tiles, Insulators etc.) and Asbestos containing products except lining of break shoes and clutch plates on 22 December 2014 through publishing a Gazette Notification by the Government of Nepal, Ministry of Population and Environment (MOPE) as per the provision of Environment Protection Act 1997 (Section 7 and Sub-section 3) with an effective date after 181 days from the date of public notification. This took effect from 20th June 2015.

So this enlarged and updated version of **National Asbestos Profile of Nepal** prepared as an important document under the project entitled “**Research and Awareness about Asbestos in Central and Eastern Nepal**” with the support of **Takagi Fund for Citizen Science, Asian Ban Asbestos Network (ABAN) and International Ban Asbestos Secretariat (IBAS)** from the first short version prepared and presented at 6th AAI in Manila, Philippines with help of WHO is expected to serve as the first ever reference document for all government agencies and stakeholders including the potential vulnerable workers and people who work as well as live with asbestos and have already suffered from Mesothelioma cancer and/or other health implications to be protected and also conserve the environment.

This document provides the latest information on asbestos and status of compliance of the government banning decision, current import, uses, hot spots, associated health and environmental implications of asbestos and action plans to address the related issues thus meets the spirit of the government's positive and progressive decisions towards protection of public health and environment and also serve as the inspirations at least for the neighboring South Asian countries and to the other regions.

Ram Charitra Sah
Executive Director

Acknowledgements

CEPHED would like to highly acknowledge the support of the Takagi Fund for Citizen Science, ABAN and IBAS, UK for their financial and technical support to make possible to produce this **National Asbestos Profile**. We would like to acknowledge Mr. Sugio Furuya from ABAN, Ms. Laurie Kazan-Allen from IBAS and Mr. Naoki Toyama, Tokyo Occupational Safety and Health Center, Tokyo, Japan for helping us to test asbestos samples as well as this report has benefited from regular guidance provided by them. We also acknowledge Ms. Satoko Shirai, Asia Program Officer, The Takagi Fund for Citizen Science for her continued support and cooperation, Mr. Mohit Gupta from Asian Network and Research Organisation Environment for Victims (ANROEV) Secretariat, New Delhi for making available data of Indian Mineral Departments. We also acknowledge the continued cooperation from Department of Custom, Ministry of Population and Environment (MOPE), Ministry of Health (MOH) and Office of the Prime Minister and Council of Minister (OPMCM), Government of Nepal for their tireless efforts towards ensuring effective implementation of the government asbestos banning decision. We also acknowledge all the Custom Offices who able to share their import data, local people mason and users, doctors who share their information about the local condition. Journalists who also highlighted the issues through their respective media are also highly acknowledged. Representative local authorities e.g. Municipalities and local journalists who continue to supporting the monitoring of market about the asbestos and keep on sending the latest pictures as well as evidence of implementation status of the asbestos ban are also highly acknowledge.

Last but the least, CEPHED is grateful for the excellent cooperation, support, and supervision provided by **Nepal Health Research Council (NHRC)**, **District Development Committee (DDC)**, **Kathmandu and Social Welfare Council (SWC)** for approving this important project to be carried out towards protection and preservation of public health and environment.

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Message



Government of Nepal
Ministry of Population & Environment



Ref. No:

10th August 2016

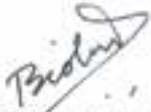
Message

It is a matter of pleasure for me to write this message for the Center of Public Health and Environmental Development (CEPHED) which is publishing the document entitled 'National Asbestos Profile of Nepal'. The profile covers different aspects like patterns of asbestos use, trends in importation of asbestos, existing national and international regulations, risky work places, prevalence of asbestos-caused occupational diseases, compensation to workers and environmental impacts of asbestos. I would like to congratulate CEPHED and its entire team involved in the preparation of this commendable document which can be an important reference for those who are working in the fields of environment and occupational safety and health.

Realizing the extreme hazards asbestos can cause to the human health and the environment, Government of Nepal has banned the importation, sales, distribution and use of asbestos and goods containing asbestos in Nepal allowing limited exceptions with effect from 20 June 2015. Since the imposition of the ban, the importation of asbestos and goods containing asbestos has been decreased to a great extent. However, the management and subsequent safe disposal of already existing stock of asbestos materials in the country remains a challenge. Moreover, the custom offices need to be equipped with modern laboratories and the custom personnel need to be trained well in order to efficiently control the importation of asbestos and other hazardous substances. The individuals working in certain risky sectors of the industry are at high risk of asbestos related diseases like asbestosis, mesothelioma and lung cancer. The government agencies, non-governmental organizations, civil societies and individuals should build a strong partnership in order to effectively put an end to the use of asbestos and safely manage its existing stocks.

The Ministry of Population and Environment has been actively working towards effective implementation and review of existing regulations and standards for management of hazardous substances including asbestos. To this end, evidence-based study on the situation of hazardous substances like this profile will be of great importance to the government.

I would like to express sincere thanks to the CEPHED for publishing this fact finding and informative document. I hope CEPHED will continue to work actively in the environment sector and generate more useful materials that will contribute towards environmental management in Nepal. I wish CEPHED success in all its future endeavors geared towards promotion of public health and protection of environment.


 Dr. Bishwa Nath Oli
 Secretary

Message



Government of Nepal
Nepal Health Research Council (NHRC)

Estd. 1991



Ref. No.: 620

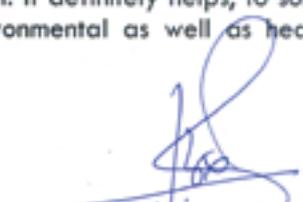
Asbestos: A hidden challenge for health

Asbestos – naturally occurring fibrous minerals having extraordinary tensile strength, resistant to heat, fire and chemicals and also bad conductor for electricity- is widely used for insulation in buildings and as an ingredient in a number of products, such as roofing, fire proofing, water supply lines, as well as clutches and brake linings, gaskets, and pads for automobiles. Unfortunately, its clear that all form of asbestos are carcinogenic to human beings. Exposure to asbestos causes mostly cancer of the lung, larynx, and ovaries, and specifically, mesothelioma (a cancer of the pleural and peritoneal linings). Additionally, it causes asbestosis (fibrosis of the lungs), and plaques, thickening and effusion in the pleura.

A half of the deaths from occupational cancer is associated with asbestos and about 125 million people in the world are exposed to asbestos at the workplace and several thousand other people are exposed to asbestos in the home – an alarming fact.

Considering these facts, use of asbestos is officially banned but in reality, still we have a huge stock of asbestos in different forms and use. In Nepal, exact figure is not available. However, this report gives an overall scenario of asbestos and its pattern of use.

I sincerely thank to Mr Ram Charitra Sah, Executive Director, Center for Public Health and Environmental Development (CEPHED), and partners for preparing national profile of asbestos for the first time in Nepal. It definitely helps, to some extend, as a baseline of the asbestos related environmental as well as health hazards.


Dr. Khem B. Karki
Member Secretary

Message

International Ban Asbestos Secretariat

website: <http://www.ibasecretariat.org>

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Campaigning for a global asbestos ban and justice for all asbestos victims!



Commentary

by Laurie Kazan-Allen, IBAS Coordinator

August 9, 2016

The publication of this detailed analysis of Nepal's asbestos landscape is both timely and significant. As the first country in South Asia to ban asbestos, the actions taken and mechanisms adopted by Nepal to protect its citizens from hazardous exposures to asbestos are a benchmark which can inform the policies of national governments and regional bodies. It is of some significance in this context to note that Nepal's neighbours are the world's second biggest asbestos producer and consumer (China) and the world's biggest asbestos importer (India). If a country like Nepal, which has been confronted by major challenges following the April 2015 earthquake, can envisage an asbestos-free future other nations can do likewise.

This comprehensive and well-written report of work undertaken by the Center for Public Health and Environmental Development under the project entitled "**Research and Awareness about Asbestos in Central and Eastern Nepal**" highlights the historic measures enacted to facilitate the transition to safer technologies and signposts measures needed to ensure that prohibitions regarding the import of toxic products are enforced. As other ban countries have learned, legal sanctions against asbestos are only effective if they are backed up by a strict enforcement policy implemented by trained and well-equipped personnel.

The research and consultations which have taken place in Nepal regarding asbestos consumption, geographical trends, workers' exposures, incidences of asbestos-related diseases and levels of environmental contamination and the data which has been accumulated as a result of these enquiries are extremely valuable. Delineating the types of employment where occupational asbestos exposures are routine and recording the types of asbestos-containing consumer products which are popular provide government agencies tasked with protecting occupational and public health with a focus for asbestos audits and enquiries. The National Asbestos Profile of Nepal marks a starting point in a national dialogue which will, if it is to succeed, provide the opportunity for all civil society stakeholders and concerned government agencies to become engaged in the battle for a safer world.

Nepal's constitution guarantees its citizens fundamental political, social, cultural and economic rights including the right to live in a healthy and safe environment. These promises can only truly be fulfilled in a society which has turned its back on the use of deadly asbestos technologies. An asbestos-free future is possible.

Laurie Kazan-Allen

Coordinator: International Ban Asbestos Secretariat

Message



The Takagi Fund for Citizen Science
認定NPO法人
高木仁三郎市民科学基金

23rd September 2016

Message to CEPHED

We, The Takagi Fund for Citizen Science founded in December 2000 and since 2001 we are funding individuals or groups in Japan and Asian countries who are pursuing "Citizen Science". Since the establishment, we have funded 265 cases (149,300,000 JPY) in Japan and 55 cases (21,800,000 JPY) in Asia respectively for the past 15 years. In 2016(15th grant opportunity), we funded 500,000 yen to the research by CEPHED "Research and Awareness Raising about Asbestos in Terai Region of Nepal". We would like to pay our highest respect to the publication of the report titled "National Asbestos Profile of Nepal" as the result of their research.

The idea of "Citizen Science" which Takagi Fund are pursuing, is based on the recognition that present-day science and technology brought us not only various convenience but also even environmental pollution, biodiversity loss, and technology caused incident which threatens our health and safety, and moreover it causes resources depletion and leave negative legacy such as hazardous waste materials remaining to the next generation. We, therefore encourage individuals or groups pursuing "Citizen Science" to conduct research, clarify issues and explore improvement plans from the standpoint of an ordinary citizen exposed to such risk, independent of the government and/or corporate interests.

Asbestos issues CEPHED is working on for their research, this time, are truly related to the negative aspects brought by science technology and must be one of the important themes for "Citizen Science". To implement the advanced policy by Nepal government solidly, which ban import, sale, distribution and uses of all form of asbestos, it is indispensable that listing of asbestos containing building material and the constructions, solid management during the repairing and dismantling asbestos containing building including safety measures preventing exposures for the workers engaged in removal operation and the surrounding resident, asbestos analysis of air and building materials and epidemiology are put into effect accurately. At the same time, the participation of experts and training specialists in each phase is also very important. By implementing the recommendations stated at "National Asbestos Profile of Nepal" with the support of many different stakeholders, we hope Nepal has great influence on other countries including Japan and leading in the area of asbestos management.

Again, we would like to pay special tribute to all people involved in publishing this report and wish you the best of luck in continuing in the research activities you are devoted to.

Tamotsu Sugunami
General Secretary, The Takagi Fund for Citizen Science

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Abbreviations

AAI:	Asian Asbestos Initiatives
ABAN :	Asian Ban Asbestos Network
AD:	Any dominy (After Death of Christ)
ANROEV:	The Asian Network for the Rights Of Occupational and Environmental Victims
ARD:	Asbestos Related Diseases
ATSDR:	Agency for Toxic Substances and Disease Registry
BPKMCH:	B.P. Koirala Memorial Cancer Hospital (or BPKMCH)
BS:	Bikram Sambat
BWI:	Building Wood Initiative
CBS:	Central Bureau of Statistics
CME:	Census of Manufacturing Establishments
CEPHED :	Center for Public Health and Environmental Development
CFL:	Compact Fluorescent Lamp
CUPPEC :	Central Union of Painters, Plumbers, Ecotro and Constructions Worker Nepal
CAWUN :	Construction and Allied Workers Union of Nepal
GEFONT:	General Federation of Nepalese Trade Unions
DDCs:	District Development Committee
DOE:	Department of Environment
DALYs :	Disability Adjusted Life Years
DUDBC:	Department of Urban Development and Building Construction
EIA:	Environment Impact Assessment
EPA :	Environment Protection Act
EPR:	Environment Protection Regulation
Ex COP:	Extra Conference of Parties
GBDs:	Global Burden of Diseases
HDI:	Human Development Index
HDPE:	High Density Poly Ethelene
IARC:	International Agency Research on Cancer
IBAS :	International Ban Asbestos Secretariat
IEE:	Initial Environment Examination
ILO :	International Labour Organization
IWMD :	International Workers Memorial Day
IS:	Indian Standard
MEAs:	Multinational Environment Agreements

MOH:	Ministry of Health
MOPE:	Ministry of Population and Environment
MOSTE:	Ministry of Science, Technology and Environment
NPHC :	National Population and Housing Census
NBC:	Nepal Building Code
NHRC:	Nepal Health Research Council
NTC:	Nepal Tele Come
OSHA:	Occupational Safety and Health Administration
ODA:	Overseas Development Agency
OPMCM:	Office of the Prime Minister and Council of Ministers
OSH:	Occupational Safety and Health
PIC:	Prior Informed Consent
PLM:	Polarized Light Microscopy
POPs:	Persistent Organic Pollutants
PVA:	Polyvinyl Acetate
PVC:	Poly Vinyl Chlorides
SAICM:	Strategic Approach for Integrated Chemical Management
SWC:	Social Welfare Council
UNEP:	United Nation Environment Program
UPVC:	Unplasticized-Polyvinyl Chloride
USAID:	United State Aid
USGS:	United State Geological Survey
VDCs:	Village Development Committee
WHO :	World Health Organization

1. Country Profile (Socioeconomic, Political and Demographic)

Federal Democratic Republic of Nepal is a landlocked sovereign state located in South Asia, with an area of 147,181 square kilometres (56,827 sq mi) and population of approximately 27 million. Nepal is the world's 93rd largest country by land mass and the 41st most populous country¹. Nepal occupies 0.3 and 0.03 percentage of land area of Asia and the world respectively. In the northern hemisphere, Nepal is situated within latitude 26° 22' N to 30° 27' N and of longitude 80° 4' E to 88° 12' E. The altitude ranges from a minimum of 70 meters to a maximum of 8848 (world's highest peak) meters whereas the climate varies with its topography. Mt. Everest – the top of the world – is both the identity and glory of this Himalayan country. The average width (North to South) is 193 kilometres whereas the average length is 885 (East to West) kilometres. The country has great variety of topography which is reflected in the diversity of weather and climate simultaneously. Specially, the country experiences tropical, mesothermal, micro-thermal, taiga and tundra types of climate².

It is located in the Himalayas and bordered to the north by the People's Republic of China, and to the south, east, and west by the Republic of India. Nepal is separated from Bangladesh by the narrow Indian Siliguri corridor. Kathmandu is the nation's capital and largest metropolis³. More than 250 peaks over 20,000 ft (6,096 m) above sea level are located in Nepal. The southern Madhesh region is flat, fertile and humid.

On September 20, 2015, a new Constitution was announced by First President Dr. Ram Baran Yadav in the Constituent Assembly. The Constituent Assembly was then transformed into a Legislative Parliament. The new Constitution established Nepal as a Federal Democratic country by making seven unnamed states.

Nepal is a developing country with a low income economy, ranking 146th of 188 countries on the Human Development Index (HDI) in 2015. It continues to struggle with high levels of hunger and poverty. Despite these challenges, Nepal has been making steady progress, with the government making a commitment to graduate the nation from least developed country status by 2022.

Year 2015/16 remains one of the most challenging years for Nepal. Earthquake followed by unintentional blocked from neighbouring country India put unprecedented impacts on human health and environment. On Saturday, 25th April 2015 at 11:56 local time, a 7.6 richter scale magnitude earthquake (as recorded by National Seismological Centre, Nepal) hit Barpak of Gorkha District, about 76 km northwest of its capital city Kathmandu. It was the most devastating earthquake since the earlier highly devastating one in 1934 AD. The catastrophic earthquake was followed by more than 462 aftershocks having local magnitude of 4.0 or more (as of 23 June 2016). Four aftershocks were greater than magnitude 6.0, including one measuring 6.8 struck back on 12th May 2016 with the epicentre near Mount Everest. To date, 8,891 casualties and 22,302 human injuries are recorded. Similarly, 6, 08,155 residential buildings were completely broken down whereas 2, 98,998 were partially damaged. Furthermore, 2,687 government buildings (including schools and health posts) were completely collapsed and 3,776 were partially damaged. Similarly, 743 historical and archaeologically invaluable sites were heritage sites/monuments were hit by the earthquake causing 133 fully collapsed, 95 partially collapsed and 515 partly damaged. It is estimated that the lives of eight million people, almost one-third of the population of Nepal, have been impacted by these earthquakes pushing back more than one million people below poverty line⁴.

1 <http://en.wikipedia.org/wiki/Nepal>

2 Statistical Hand book 2014

3 <http://en.wikipedia.org/wiki/Nepal>

4 <http://www.nra.gov.np/pages/details/about> (National Reconstruction Authority)



Figure 1 Geo-political maps (1. Between Nepal and China 2. Federal Division) of Nepal

Table 1. Losses due to 2015 Earthquake disaster⁵

25 April 2015 is the worst earthquake in Nepal in 80 years.	7.6 Richter Scale
People died	8790
People injured	22300
Houses destroyed or damaged	800000
School Damaged or destroyed	7000
Districts Affected	31 out of 75
Support, Emergency relief and humanitarian assistance received from	Over 60 countries
Large Cattles lost	17000
Smaller domesticated animals lost	40,000
Additional poor pushed into poverty in 2015-16	700,000
Road Network Affected by the Earthquake	20%
Total damage and loss from the disaster	US\$ 7.065 Billion

Nepal is rich in natural resources such as forest, water and biodiversity. Forest covers approximately 39.6% land of the total area. The number of all-season rivers touches hundreds in number though has not yet been fully exploited in generating electricity and irrigation. Administratively, the country had earlier been divided into five development regions, 14 zones and 75 districts. Likewise, there are 217 municipalities that are considered as urban and 3276 Village Development Committees (VDCs) which are predominantly rural areas⁶.

According to the Population Census 2011, the total population is 26.5 million with annual growth rate of 1.35 per annum and 54, 27,302 individual households. From the same census it is found that 6.7, 43.0 and 50.3 per cent of total population is living respectively in the Mountain, Hill and Terai. As such the geographical distribution of population is uneven. The population density in the year 2011 was 180 people per square kilometer. Similarly, the literacy rate of male and female are 75.1 and 57.4 per cent giving on average of 65.9 per cent.⁷ Nepal has per capita income of about \$490.⁸

A survey conducted in all 58 municipalities of Nepal in 2012 found that the average municipal solid waste generation was 317 grams per capita per day. This translates into 1,435 tons per day or 524,000 tons per year of municipal solid waste generation in Nepal. Many of these technically and

5 PDNA 2015 Report

6 Statistical Pocket Book 2014, CBS, GoN

7 ibid

8 <http://ask.weallnepali.com/91/what-is-the-per-capita-income-of-nepal>

financially constrained municipalities are still practicing roadside waste pickup from open piles and open dumping, creating major health risks ⁹.

With respect to Hazardous waste, country has increased amount of electrical and electronic waste, obsolete pesticides, POPs Waste, about 1400 tonnes per year of health care waste and asbestos waste is on rise and will be going to be serious emerging issues in near future as millions tonnes of asbestos and asbestos containing products has been imported and used in the country before ban imposed in the year 2015.

1.1 Housing Pattern and Construction Materials

Despite of asbestos can be found in different geographical region of the country, it has been massively used in Terai. According to the population census in 2011, Terai comprises 20 districts which account for 17% of the total area of Nepal and has 51% of the Nepalese Population. In Terai, communities with similar ethnic groups use to live together in a small to large clusters. However, due to division in family based on increasing the family members, they have now making clusters of mixed ethnic group and economic status. A typical village and cluster in Terai, now a day is mixture of family of different caste, ethnic groups and diverse economic status found to be living together.



Figure 2 A typical residential house in Terai with traditional Clay soil tile, Asbestos sheets and concrete roofing together

Thus a village hamlet consists of different big and small houses made of concrete cement to thatched roofed mud houses. Due to increase in foreign remittance in all most all part of Nepal including Terai, there has been a great improvement in housing and sanitation condition as all most all houses are increasingly made of cement, brick and concrete with toilet and water tube well facility. Construction of concrete house is on rise whereas who did not able to afford full concrete buildings, at least had brick walls but **carcinogenic Asbestos roofing** is of great concern of now and future.

The local advertisement and promotion of toxic Asbestos has raised its massive uses for roofing purposes and one can find almost each alternate house in a typical Teria village is having asbestos roofing. People were told asbestos as the best roofing materials; it provides warms in winter and keeps cold in summer by associated vendors from dealers to retailers. Neither government nor business community are able to provide real information about asbestos carcinogenicity. As a result, a home considered to be heaven becoming hell for a people as it may cause cancer to the person who lives in. Media houses and artists found to be much interested to advertise whatever advertisement comes to them without having any idea about the toxic impact and environmental degradation potential of the products they are promoting. Regarding asbestos and asbestos based products, it has been imported and used in the different rural to urban area for various purposes from roofing of

school, garage, industrial units etc. to insulating materials in industrial setting. There might be some health and environment implications out of these decade long use and mishandling of asbestos, waste and other products.

1.2 Asbestos and its uses

The term “**asbestos**” is used for a group of naturally occurring minerals that take the form of long thin fibres and fibre bundles. Asbestos is a mineral fiber that occurs in rock and soil. Chemically, asbestos minerals are silicate compounds, meaning they contain atoms of silicon and oxygen in their molecular structure. Although asbestos fibers are tiny in nature, they are extremely durable, resistant to heat, fire, chemical reactions, electricity and breakdowns. It became material of choice as roofing shingles, floor tiles, ceiling materials; cement compounds, textile products, and automotive parts etc. These minerals have great tensile strength, conduct heat poorly and are relatively resistant to chemical attack. Asbestos is non-biodegradable. The principal varieties of asbestos are Chrysotile (known as white asbestos) a Serpentine mineral, and Crocidolite (blue asbestos), Amosite (brown asbestos), Anthophyllite, Tremolite and Actinolite, all of which are amphiboles. The chrysotile is the one most

Asbestos is widely used throughout the world, particularly in building and insulation materials. Typical uses include: Boilers and heating vessels, Cement pipe, Clutch, brake, and transmission components, Conduits for electrical wire, Pipe covering, Roofing products, Duct and home insulation, Fire protection panels Furnace insulating pads, Pipe or boiler insulation, Sheet vinyl or floor tiles, Underlay for sheet flooring etc.¹⁰.

Asbestos is one of the most important occupational carcinogens, causing about half of the death from occupational cancer. According to global estimates at least 90,000 people die each year from asbestos-related lung cancer, mesothelioma and asbestosis resulting from occupational exposures. Worldwide, WHO has explicated that 125 million people are potentially exposed to asbestos, One-third or around 75 million of these are in the South East Asia and Western Pacific Regions¹¹. Few countries in



Figure 3. Asbestos Fibers



Figure 4 Asbestos sheet stacked for sale in Janakpur Market, Nepal



Figure 5 Asbestos sheets massively used in Terai

10 . <http://www.searo.who.int/entity/emergencies/documents/asbestos.pdf?ua=1>

11 WHO September 2006, WHO/SDE/OEH/06.03

South-East Asia have accurate information or a good awareness of the use of asbestos in their countries where as some countries like our Nepal do not have such level of information and awareness and hence this national profile aims to blueprint the existing status of asbestos and related issues in Nepal.

1.3 Objective

- Prepare a National Asbestos Profile (NAP) of Nepal that helps to development of National Action Program to elimination of asbestos related diseases and environmental degradations.
- Update the compliance status of the government decision of banning Asbestos.

2. Current regulations (National and International) on the different forms of asbestos

There are number of national and international policy and regulation adopted by the Government of Nepal that dealt with the protection human health and environment including specific gazette notification directly banning of import, sales, distribution and uses of asbestos are in place.

2.1 National Policies and Regulations

Nepal believes in an integrated approach to democracy, development and human rights and regards them as a triad of the civilized society. Nepal holds the view that all human rights are universal, indivisible, interdependent and inter-related and as such they merit equal emphasis. The new Constitution of Nepal 2015 reaffirms Nepal's commitment to human rights by guaranteeing fundamental political, social, cultural and economic rights to the citizens.¹²

Nepal has recently promulgated a Constitution through the Constituent Assembly on 20 September 2015 which encompasses over 30 different fundamental rights including that of workers and/or labours in line with the International Labour Standards and others and also includes the compensation provision in case of failure of ensuring these fundamental rights by perpetrator. In summary, right to employment and social security, right to form trade unions and right for collective bargaining etc. are major labour related rights already included into the constitution of Nepal.

Right to live in healthy and safe environment has been recognised by the new Constitution of Nepal 2015 as fundamental right of the citizen of Nepal.

12 New Constitution of Nepal 2015

Table 2. The major rights ensured under the Constitution of Nepal

Articles (Sub Articles)	Description of Fundamental Right
16	Right to live with dignity
17 (2)	Right to Freedom (to form union and association)
18 (4)	Right to equality (There shall not be any gender discriminations regarding remuneration for the same work and social security.
19 (1)	Right to communication (. or disrespect labour,)
27	Right to information: Every citizen shall have the right to seek information on any matters of concern to her/him or the public.
28	Right to Privacy
29(2)	Right against exploitation (any kind of exploitation on any basis)
30 (1)	Right regarding clean environment (Each person shall have the right to live in a healthy and clean environment.)
30(2)	The victim of environmental pollution and degradation shall have the right to be compensated by the pollutant as provided for by law.
33(1)	Right to employment (Every citizen shall have the right to employment. . . .)
33(2)	Every citizen shall have the right to select employment.
34 (1)	Right regarding labour (Every labourer shall have the right to proper work practices.)
34 (2)	Every labourer shall have the right to appropriate remuneration, facilities and contribution-based social security.
34 (3)	Every labourer shall have the right to form trade union, participate in it, and organize collective bargaining.
35 (1)	Right to healthcare (Every citizen shall have the right to seek basic health care services from the state and no citizen shall be deprived of emergency health care.)
35 (2)	Each person shall have the right to be informed about his/her health condition with regard to health care services.
35 (3)	Each person shall have equal access to health care.
35 (4)	Each citizen shall have the right to access to clean water and hygiene.
36(1)	Right to food (Each citizen shall have the right to food.)
38(1)	Right of Women (Every woman shall have equal right to lineage without any gender discriminations.)
38(2)	Every woman shall have the right relating to safe motherhood and reproductive health.
38(5)	Women shall have the right to special opportunity in the spheres of education, health, employment and social security on the basis of positive discrimination.
39(4)	Right of children (No child shall be employed in factories, mines, or in any other hazardous works.)
39(6)	No child shall be subjected to recruitment.
39(7)	No child shall be subjected to physical, mental, or any other forms of torture at home, in school, or in any other places or situations etc. .

Environment Protection Act (EPA-1997) and Environment Protection Regulation (EPR 1997)

dose have provision for the Asbestos Production Industries of all sizes required to carry out full scale EIA (Environmental Impact Assessment). Asbestos industry falls under non-metallic industries e.g. Asbestos industries of all sizes (Schedule 2, Rule 3, B. Industrial Sector, 12. Production of Asbestos) however, such cancer causing industries did not required Pollution Control Certificate of as per the Schedule-7, (Relating to Sub-Rule (1) of Rule 16) of the Environment Protection Regulation.¹³ These provisions of EPA and EPR need to be amended and make it compatible with the government asbestos banning decision.

Chapter 3 of Environment Protection Regulation deals with Prevention and control of pollutions (rule 15). Prohibition to emit waste in contravention of the prescribed standards:

No one shall emit or cause to emit the noise, heat and waste from any mechanical means, industrial establishment or any other place in contravention of the standards prescribed by the Ministry by a Notification published in the Gazette.

13 Environment Protection Act 1997 and Environment Protection Regulation 1997

Chapter 8 of Environment Protection Regulation deals with Compensation and other provisions (Rule 45). May file an application for realizing compensation : -In case anyone wishes to realize compensation from any individual, institution or proponent under section 17 of the Act, he/she may Submit an application to the concerned Chief District Officer mentioning the type of loss suffered by him/her as a result thereof, and the amount of compensation sought by him/her.

2.1.1 Asbestos Ban in Nepal: Government Banned Import, Sale, Distribution and Use of Carcinogenic Asbestos

Government of Nepal, Ministry of Population and Environment-MOPE (the then MOSTE) as per the provision of Environment Protection Act 1997 (Section 7 and Sub-section 3) decided to Ban of Import, Sale, Distribution and Use of all Asbestos and Asbestos containing products including Corrugated, Non Corrugated Sheet, Tiles, Insulators by publishing a notice i Nepal Gazette (Khand 64, Number 30, Part 5, Date December 22, 2014, Notice No. 4). This decision helps to protect human health as well as environment from negative consequences of Asbestos. This decision of will automatically come into effect on 181 days from the date of gazette notification¹⁴.

खण्ड ६४ संख्या ३० नेपाल राजपत्र भाग ५ मिति २०७१।१७

सूचना ४

नेपाल सरकारले वातावरण संरक्षण ऐन, २०५३ को दफा ७ को उपदफा (३) ले दिएको अधिकार प्रयोग गरी यो सूचना प्रकाशन भएको मितिले १८१ औं दिनदेखि लागू हुने गरी सवारी साधनमा प्रयोग हुने Brake Shoe र Clutch Plate को Asbestos Lining बाहेक Asbestos Corrugated/ Non-Corrugated Sheet, Tiles, Insulators आदि सबै Asbestos र Asbestos युक्त वस्तुको आयात, बिक्री वितरण र प्रयोग गर्न प्रतिबन्ध लगाएको छ ।

आज्ञाले,
महेन्द्र मान गुरुङ्ग
नेपाल सरकारको नि.सचिव

(२३)

Nepal Gazette
Published by Government of Nepal
Part 5,
Government of Nepal
Ministry of Science, Technology and Environment
Notice No. 4

(Khand 64, Number 30. Nepal Gazette, Part 5, Date: 22 December 2014)

In exercise of the power conferred by Environment Protection Act 1997 (Section 7 and Sub-section 3), shall come into effects from 181 days from the date of publication of this notice by the Government of Nepal has banned the Import, Sale, Distribution and Use of all Asbestos and Asbestos containing products including Corrugated, Non Corrugated Sheet, Tiles, Insulators etc. except the asbestos lining of automobile`s brake shoe and clutch plate.

With permission
Mahendra Man Gurung
Acting Secretary, Government of Nepal

Figure 6. Nepal Gazette on Ban on Import, Sale, Distribution and Uses of Asbestos

Environment Protection Act 1997, Section (7). Prevention and Control of Pollution Sub Section 7 (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.

Sub Section 7 (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.

CEPHED successfully campaigned for the banning of asbestos and achieved the results.

Solid Waste Management Act 2011 and Solid Waste Management Regulation 2013: Solid Waste Management act enacted to manage the solid waste in a systematic and effective way by reducing at its source, re-use, processing or discharge and for maintaining a clean and healthy environment through the reduction of adverse effects that may be caused to the public health and environment. It define "**Solid Waste**" means domestic waste, industrial waste, chemical waste, health institution related waste or harmful waste and this word shall also mean the materials which cannot be used presently, thrown away. Also define "**Harmful Waste**" means any substance, matter or radioactive radiation produced in any form, capable of derogating the natural environment, causing damage or, injury to human or living being's health.

Though local body are held responsible to manage solid waste, the prime responsibility for the processing and management within the set standard of harmful waste, health institution related waste, chemical waste or industrial waste shall be of the individual or body producing such solid waste (Art. 4).

Laboratory induced Hazardous Allowance Guideline 2015: As per the power conferred by the Governance Act 2007 (Art. 45), Government of Nepal has prepared this guideline. According to this guideline, people working in a laboratory for analysis, research and training under the controlled condition using different chemicals, radiation, microorganism and scientific equipment's hampering the health in any Government of Nepal's Offices and working place are entitled to get laboratory induced hazardous allowance as decided by the hazardous allowance committee.

Industrial Enterprises Act 1992 though have provision of requiring permission for establishing some of the industries based on Tobacco , explosive and security related, the cancer causing Asbestos industry did not required any permission to be established.

Town Development Act, 1988 (2045). It authorizes Town Development Committees to regulate, control, or prohibit any act or activity that causes environmental pollution and implicates adverse effect on public health or aesthetic beauty of an area. It contains penalty provisions in the form of fines for the violation of the Act.

The Building Act 1998 made necessary provisions for the regulation of building construction works in order to protect building against earthquake, fire and other natural calamities, to the extent possible, formulate a building code, make recommendation to the Nepal Quality Assurance Council to determine the quality of native or foreign materials related with building construction, classification of buildings, power to supervise the building construction etc.

Labor Act 1992,¹⁵ The Labor Act and its subsidiary rules are the main legislation in the country that covers the working conditions, welfare of workers, safety and health, and industrial disputes. The coverage of the Labor Act is confined to enterprises employing ten or more workers.

Chapter 5 of this Act dealt mainly with Health and Safety issues and have made very good provision listed below in different sections of the Act.

Section 27. **Provisions Relating to Health and Safety**, the proprietor shall make the arrangements in the Enterprise as mentioned below:

- To Keep each Enterprise clean and tidy by cleaning daily including with germicidal medicines, necessary arrangements of proper drainage and colouring from time to time and preventing from odour;
- To make arrangements for adequate supply of fresh air and light as well as proper temperature in the working rooms;
- To make arrangements of removal and disposal of solid waste during production process,
- To make arrangements of prevention of accumulation of dust, fume, vapour and other impure materials in working rooms which would adversely affect the health;
- To make arrangements of necessary preventive personal devices for protection of health from adverse any other source, and make provisions this would produce less noise during the work process;
- To avoid any congestion in the work-room or work place leading to injurious to the health of workers or employees and to avail working space to each worker or employee, according to the nature of the job, or normally fifteen cubic meters and, the height above four meters from the floor surface shall not be counted for such purposes.
- To make provisions for sufficient supply of pure potable water during the working hours, and to make arrangement for sufficient water in the Enterprise where chemical substances, are used or produced which may be injurious to the health, for the purpose of extinguishing fire or washing and cleansing during emergency situations;
- To make provisions for separate modern type toilets for male and female workers or employees at convenient place;
- To declare as non-smoking zone in all or some parts of the Enterprise, according to the nature of its works; and
- To cause to **conduct compulsory health check-ups of the workers or employees once every year** in the Enterprises where the nature of works is likely to affect the health adversely.

Section 28 of the Act has provision of **Protection of Eyes** through having

- Necessary protective means shall have to be arranged for the protection of eyes of the workers and employees from injuries likely to be caused by dust or pieces while working in the Enterprise using glass, mercury, magnet, pallets, iron, concrete, cement, lime, stone and explosive substances.
- Necessary protective devices shall have to be arranged to protect the eyes from harmful rays coming from during the process of welding or gas-cutting, or other similar works.

Section 29 of the Act has provision of Protection **from Chemical Substance** by the Proprietor shall have to make provisions for necessary personal protective devices for the protection of workers or employees handling chemical substances.

¹⁵ . <http://www.ilo.org/dyn/travail/docs/581/Labour%20Act%201992.pdf>

Labour and Employment Policy 2005 (2062 BS)¹⁶ has provision of long term goal is to provide productive, non-discriminatory, exploitation-free , decent, safe and healthy work opportunities for citizens of the working ages by building an environment of friendly investments.

The workplace will be made safe, healthy and productive by promoting and developing occupational health and safety and reproductive health as inherent aspects of all organizations and workplaces (subsection 3.3.4).

Safety and health committees will be constituted and effectively conducted for the identification, planning, implementation, follow-up, evaluation and improvement of activities related to occupational safety and reproductive health at the workplace(subsection 3.3.10).

Along with the development of a reporting and documentation system on occupational hazards, training in occupational safety and health will be provided for workers and management personnel (subsection 3.3.11).

A manual will be prepared and implemented for the promotion of occupational safety and health, including the management of stress at the workplace (subsection 3.3.12).

2.1.2 Building Codes and Building Materials

Nepal's National Building Code (NBC) was formulated in 1994. After almost 20 years of its existence, the actual implementation still remains a critical issue. In Nepal, municipalities are the responsible agencies to issue building permits. The current municipal building permit process does not ensure the compliance of NBC. Only 3 viz: Kathmandu, Lalitpur and Dharan out of 58 old municipalities in Nepal have tried to incorporate NBC into their building permit process; but these attempts have been too limited and lack the necessary verification to ensure compliance. All municipalities in Nepal did not have even fully equipped to do so. The de facto building permits process in Kathmandu and Lalitpur is very superficial and subjective even though both municipalities enforce NBC compliance in theory. Few generalized checklists have been developed and the questionnaires in checklists are overlooked and easily manipulated. There is no effective mechanism for field verification of approved drawings.

The tracking system of building permit processing is also inefficient. Often permit application documents under certification process are lost and manipulated. The documents are found to be replaced with new ones which have been manipulated to conform to the NBC code compliance rules. In order to overcome this malpractice, an effective governance system which can ensure transparency and accountability of the system in each stage of process is required. All these factors necessitated to design an automated system - Electronic Building Permit System (EBPS) - which can systematically handle the complexities of building code compliance and building permit system for both new buildings as well as old building stocks. The sole aim of the automated system is to effectively implement the NBC and Building By-Laws (BBL) to promote safe building construction practices and planned urban development in the national capital of Nepal - mainly Kathmandu and Lalitpur municipalities.

While some initiatives have been made from manual building permit system to E-BPS, the closing concerns related to the Nepal Building Code (NBC) 101: 1994 , Material Specification has been specially of our interest as it aimed to regulate the specific construction materials and associated waste especially with respect to the toxic composition of construction materials and waste.

16 http://www.moltn.gov.np/uploads/document/Labour%20policy-Eng-2062_20110904014004.pdf.

As government of Nepal banned the import, sale, distribute and uses of all form of Asbestos contained construction materials and fixed the lead paint standard of 90 ppm of lead for all paint, the Material Specification related Building Code 101 and Constructions Safety related Building Code 114 have to be reviewed and revised in this light.

Materials

The use of materials confirming to **NS (Nepal Standard)** or **IS (Indian Standard)** or any other approved standards agency shall deem to have satisfied the requirements of this Standard. A list of such **Nepal Standards** and **Indian Standards** appear in section 9 of the Material Specification NBC 101. Standards which are mandatory as minimum requirements for buildings designed to comply with other Nepal Standards for Engineered design has still the provision of using Asbestos as mentioned in Table 9.1. of the building codes as follows.

C. ASBESTOS CEMENT PRODUCTS. According to which it allows

IS: 459-1970: Specification for unreinforced corrugated and semi-corrugated asbestos cement sheets (second revision).

IS :1626: Specification for asbestos cement building pipes and pipe fittings, gutters and gutter fittings and roofing fittings.

IS : 2096-1966 : Specification for asbestos cement flat sheets.

IS: 2098-1964: Specification for asbestos cement building boards.

IS: 5913-1970: Methods of test for asbestos cement products.

IS: 6908-1975: Specification for asbestos cement pipes and fittings for sewerage and drainage.

IS: 7639-1975: Method of sampling asbestos cement products.

IS: 9627-1980: Specification for asbestos cement pressure pipes (light duty).

Y. READY MIXED PAINTS AND ENAMELS

IS: 101-1964 Methods of test for ready mixed paints and enamels (second revision)

IS: 102-1962 Specification for ready mixed paint, brushing, red lead, non-setting, and priming (revised)

AA. VARNISHES AND LACQUERS

IS :197-1969 Methods of sampling and test for varnishes and lacquers (first revision)

These need to be amended and use our own Nepalese Standard of Lead in Paint not containing more than 90 ppm of lead.

Likewise the NBC 114 deals with the Constructions Safety related Building Code. It includes

10 Constructions of Roofs

10.2 When roofs are to be covered with corrugated iron sheet or asbestos cement sheet, or similar each joint shall be fixed securely so as to prevent slippage during construction.

10.3 Workers shall not be allowed to walk directly on asbestos cement sheet.

Similarly, NBC 208 : 2003, **Sanitary and Plumbing Design requirements** has still the provision of using Asbestos Cement pipe for 2 Disposal of Sewage/Waste Water and Pipe Work : 2.3 The pipes used for disposal /conveyance of sewage /waste water can be either Salt Glazed Stoneware Pipe, Cement Concrete Pipe (Plain or reinforced) Cast Iron pipe, Galvanized Iron Pipe , Asbestos Cement Pipe , Lead Pipe , PVC or HDPE Pipe . The jointing of those pipes will be either spigot and socket type or collar type (2, 2.3)¹⁷ as well as Rain **Water Disposal** . Rainwater pipes shall be constructed of cast iron, PVC pipe asbestos cement, galvanized sheet or other equally suitable material and shall be securely fixed (C, 8).

2.1.3 Green Building Guidelines:

Green building Guideline has been under preparation which though included several good and environmentally sound practices in a home to be declared as the Green Home. These includes green building material mainly the hollow blocks, passive solar design, energy efficiency, water conservation and waste management. It did not considered construction materials which might be toxic such as leaded paint, asbestos roofing , asbestos piping and insulating materials, CFL Bulbs contain toxic mercury, solar panel consist of Lead sheet and storage battery etc. need to be mentioned and safer alternative should be included into the Green Building Guidelines. CEPHEd has well informed the Department of Urban Development and Building Construction (DUDBC), Ministry of Urban Development, Government of Nepal and developing partner like UN Habitat and European Union about these issues to be addressed.

2.1.4 Bylaws on Settlement Development, Urban Planning and Building Construction 2015

The government endorsed Fundamental Construction Bylaws on Settlement Development, Urban Planning and Building Construction 2015 focusing on developing safer communities to deal with future disaster risks.

The standards prepared by the Ministry of Urban Development comes six months after the country was hit by a devastating earthquake causing huge damage of lives and properties, including the damage of buildings built without following basic building safety code. The new bylaws state that buildings up to 10m high have to leave a minimum of 1.5m setback from the border of the land plot. Only houses up to three storeys and having a common height can be joined together.

Public buildings up to 17m high have to leave a minimum setback of 3m while non-public buildings have to allocate for 2m setback. The minimum setback for even taller buildings is 5m.

The new bylaws are a “definite improvement” on the shortcomings of National Building Code of 1994. “The provision for compulsory load-bearing capacity testing for land plots filled with 1m soil and the provision on building foundations are in par with latest technological standards,”. It has also provision for the formation of a Central Urban Planning and Building Construction Bylaws Improvement and Supervision Committee for facilitating the implementation of the new building code.¹⁸ It required implementing in all municipalities including all the VDCs with more households.

There are some other bilateral and multilateral agreement between Nepal and other countries that have provision to export Asbestos and related materials into Nepal¹⁹.

17 NBC 208 : 2003, Sanitary and Plumbing Design requirements, p 27 and p 33.

18 <http://kathmandupost.ekantipur.com/news/2015-10-28/govt-brings-new-building-bylaws.html>

19 http://www.fncci.org/text/policy_highlights.pdf

These agreements are

2.1.5 Bilateral and Multilateral trade agreements with asbestos import provision

(A) **Trade agreement between Government of Nepal (the them His Majesty's Government of Nepal) and The Government of The Arab Republic of Egypt** done and signed at Kathmandu on Tuesday Twenty Third Day of December Nineteen Hundred and Seventy Five. This agreement has some good provision related to health and safety. Namely **Article III of the Agreement deals with the High Contracting Parties shall do their best to promote expand the volumes trade between the two countries in particular with regard goods and commodities mentioned in List "A" and "B" annexes which form an integral part of this Agreement. List "A" designates the List of exports from Nepal and List "B" designates the List of exports from the Arab Republic of Egypt.**



Figure 7 Import of Asbestos sheets from other countries to Nepal

Article V of the same agreement dealt with the foregoing provision, either High Contracting Party may maintain or introduce such restrictions are necessary for the purpose of: Protecting human, animal and plant life among others. According to this agreement, the list "B" Egypt's Exports to Nepal (14 items) includes Asbestos Sheets

(B) Nepal's Trade & Transit Agreement between Government of Nepal (the them His Majesty's Government of Nepal) and The Government of The Czechoslovak Socialist Republic **Trade and Payments Agreements Signed in Kathmandu 12th December, 1992** dose have provision of **exporting Asbestos cement pressure pipes to Nepal.**

(C) Another agreement between **Government of Nepal (the them His Majesty's Government of Nepal) and The Government of The Socialist Federal Republic of Yugoslavia** with list of Commodities Signed at Kathmandu September 5, 1965 dose have provision of **exporting Asbestos, cement pipes and fittings to Nepal.**

In light of the Government of Nepal's decision of banning all form of Asbestos and Asbestos containing products, all these international and bilateral agreements with the provision of import and export of asbestos containing products need to be revised and updated.



Figure 8. Import, Sale and Distribution of Asbestos in different part of country (Dhanusha, Siraha, Bara , Parsa)

2.2 International Policies and Regulations

Action on elimination of asbestos-related diseases has a sound international basis that includes primarily ILO international instruments, WHO recommendations and multilateral environmental agreements.

2.2.1 ILO standards

The Occupational Cancer Convention, 1974 (No.139) requires Parties to “periodically determine the carcinogenic substances and agents to which occupational exposure shall be prohibited or made subject to authorization or control...” (Article 1). Parties to the Convention “shall make every effort to have carcinogenic substances and agents to which workers may be exposed in the course of their work replaced by non-carcinogenic substances or agents or by less harmful substances or agents; in the choice of substitute substances or agents account shall be taken of their carcinogenic, toxic and other properties” (Article 2)²⁰.

The Asbestos Convention, 1986 (No.162) provides that “where necessary to protect the health of workers and technically practicable, national laws or regulations shall provide for one or more of the following measures - (a) replacement of asbestos or certain types of asbestos or products containing asbestos by other materials or products or the use of alternative technology, scientifically evaluated by the competent authorities as harmless or less harmful, whenever this is possible; (b) total or partial prohibition of the use of asbestos or certain types of asbestos or products containing asbestos in certain work processes.” (Article 10)²¹. The Asbestos Convention prohibits the use of crocidolite and products containing this fibre, as well as spraying of all forms of asbestos.

The Chemicals Convention, 1990 (No.170) requires that “when in an exporting member State all or some uses of hazardous chemicals are prohibited for reasons of safety and health at work, this fact and the reasons for it shall be communicated by the exporting member State to any importing country” (Article 19)²².

The Resolution on Asbestos of the 95th International Labour Conference (2006) stipulates that the elimination of the future use of asbestos and the identification and proper management of asbestos currently in place are the most effective means to protect workers from asbestos exposure and to prevent future asbestos-related diseases and deaths. It also indicates that the **Asbestos Convention, 1986 (No.162)**, should not be used to provide a justification for, or endorsement of, the continued use of asbestos. It encourages countries to ratify and give effect to the provisions of **the Asbestos Convention, 1986, and the Occupational Cancer Convention, 1974**; to promote the elimination of future use of all forms of asbestos and asbestos containing materials; to promote the identification and proper management of all forms of asbestos currently in place; and to include measures in national programmes on occupational safety and health to protect workers from exposure to asbestos.²³

20 ILO Occupational Cancer Convention, 1974 (No.139) and ILO Occupational Cancer Recommendation, 1974 (No.147); full text available at <http://www.ilo.org/ilolex/english/index.htm>

21 ILO Asbestos Convention, 1986 (No.162) and ILO Asbestos Recommendation, 1986 (No.172), full text available at <http://www.ilo.org/ilolex/english/index.htm>

22 ILO Chemicals Convention, 1990 (No.170) and ILO Chemicals Recommendation, 1990 (No. 177), full text available at <http://www.ilo.org/ilolex/english/index.htm>

23 Resolution Concerning Asbestos. In: *Ninety-fifth International Labour Conference, Geneva, 31 May - 16 June 2006. Report of the Committee on Safety and Health*. Geneva, International Labour Conference (Provisional Record 20), Annex 20/69, available at <http://www.ilo.org/public/english/standards/relm/ilc/ilc95/pdf/pr-20.pdf>

2.2.2 Resolution concerning asbestos (adopted by the 95th Session of the International Labour Conference, June 2006)

The General Conference of the International Labour Organization. Considering that all forms of asbestos, including Chrysotile, are classified as known human carcinogens by the International Agency for Research on Cancer, a classification restated by the International Programme on Chemical Safety (a joint Programme of the International Labour Organization, the WHO and the United Nations Environment Programme (UNEP)). Recognising all the form of illness, death and occupational injuries, diseases and deaths, ILO came with the international resolution that stated as follows.

1. Resolves that:

- The elimination of the future use of asbestos and the identification and proper management of asbestos currently in place are the most effective means to protect workers from asbestos exposure and to prevent future asbestos-related diseases and deaths; and
- The Asbestos Convention, 1986 (No. 162), should not be used to provide a justification for, or endorsement of, the continued use of asbestos.

2. Requests the Governing Body to direct the International Labour Office to:

- Continue to encourage member States to ratify and give effect to the provisions of the Asbestos Convention, 1986 (No. 162), and the Occupational Cancer Convention, 1974 (No. 139);
- Promote the elimination of future use of all forms of asbestos and asbestos containing materials in all member States;
- Promote the identification and proper management of all forms of asbestos currently in place;
- Encourage and assist member States to include measures in their national programmes on occupational safety and health to protect workers from exposure to asbestos;
- Transmit this resolution to all member States.

2.2.3 Multilateral Environmental Agreements (MEAs)

There are two main multilateral environmental agreements that play an important role in international trade and management of asbestos. **The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade** includes all types of asbestos of the amphibole group in its Annex III of substances subject to the prior informed consent procedure²⁴. The 2006 Conference of the Parties to the Rotterdam Convention decided that chrysotile asbestos meets the requirements and the criteria for inclusion in Annex III of the Convention and that the 2008 Conference shall further consider its inclusion in Annex III²⁵. During the ExCOP meeting of Basel, Rotterdam and Stockholm Convention in the year 2015 and in the COP 7 of Rotterdam Convention once again able to block the listing of Chrysotile asbestos in Annex III. ***Russia, Kirgizstan, Kazakhstan, Zimbabwe, Cuba, Pakistan and India are the major countries to block the listing while Government of Nepal has endorsed the listing of Chrysotile.***

Furthermore, wastes that contain asbestos dust and asbestos fibres are considered a hazardous waste (Annex I, item Y36) under the **Basel Convention on the Control of Trans- boundary Movements**

24 UNEP/FAO Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade; available at <http://www.pic.int/>

25 UNEP/FAO/RC/COP.1/33 report of the Conference of the Parties to the Rotterdam Convention on the Prior Informed Consent Procedure for certain Hazardous Chemicals and Pesticides in International Trade on the work of its first meeting, Geneva 20-24 September 2004, available at <http://www.pic.int/cops/reports/z33/English/COP%201-33%20e.pdf>

of **Hazardous Wastes and Their Disposal**, and are, therefore, subject to strict control. Nepal is party to both these MEAs Rotterdam Convention and Basel Convention since obelise to adopt all the control measures inbuilt to them²⁶.

2.2.4 WHO Recommendations

The 58th World Health Assembly urged Member States to pay special attention to cancers for which avoidable exposure is a factor, particularly exposure to chemicals at the workplace and the environment.²⁷ Asbestos is one of the most important occupational carcinogens causing about half of the deaths from occupational cancer. In May 2007, the 60th World Health Assembly endorsed a global plan of action on workers' health 2008-2017 in which Member States requested the WHO Secretariat to include in its activities "a global campaign for elimination of asbestos-related diseases - bearing in mind a differentiated approach to regulating its various forms - in line with the relevant international legal instruments and the latest evidence for effective interventions..."²⁸

WHO's assistance to countries to eliminate asbestos-related diseases will therefore be particularly targeted to those Member States that still use Chrysotile asbestos, in addition to assistance in relation to exposures arising from historical use of all forms of asbestos²⁹.

WHO in collaboration with ILO and with other intergovernmental organizations and civil society, will work with countries towards elimination of asbestos-related diseases in the following strategic directions:

- by recognizing that the most efficient way to eliminate asbestos-related diseases is to stop the use of all types of asbestos;
- by providing information about solutions for replacing asbestos with safer substitutes and developing economic and technological mechanisms to stimulate its replacement;
- by taking measures to prevent exposure to asbestos in place and during asbestos removal (abatement);
- by improving early diagnosis, treatment, social and medical rehabilitation of asbestos-related diseases and by establishing registries of people with past and/or current exposures to asbestos.³⁰

However, Nepal is neither party to the ILO Convention 162 Asbestos Convention 1986 nor the ILO Convention 139 on occupational cancer Convention 1974 which is to protect against carcinogenic substances or agents and safeguard for workers' rights. This Convention requires Member States to implement national laws or regulations to protect workers against carcinogenic substances of agents.

2.2.5 International Banning of Asbestos

To date, over 60 countries including all the member states of the European Union have banned the use of all forms of asbestos, including Chrysotile. Other countries have introduced less stringent

26 ILO and WHO 2007, Outline for the Development of National Programs for Elimination of Asbestos related Diseases

27 WHA 58.22 Cancer prevention and control, In: *Fifty-eight World Health Assembly, Geneva, 16 - 25 May 2005. Resolutions and Decisions*. Geneva, World Health Organizations, available at http://www.who.int/gb/ebwha/pdf_files/WHA58/WHA58_22-en.pdf

28 See paragraph 10 in the Annex of WHA 60.26 Workers' Health: Global Plan of Action, in Sixtieth World Health Assembly, Geneva 14-23 may 2007, Resolutions and Decisions, World Health Organization, available at http://www.who.int/gb/ebwha/pdf_files/WHA60/A60_R26-en.pdf

29 <http://www.issa.int/wssf07/documents/pdf/reports/en/2-AP.pdf>

30 See document WHO/SDE/OEH/06.03, Elimination of Asbestos-related Diseases, WHO, Geneva, 2006 available at http://www.who.int/occupational_health/publications/asbestosrelateddiseases.pdf

restrictions; however some countries have maintained or even increased their production or use of Chrysotile in recent year.³¹

Table 3. Countries Bans and Restricted uses of asbestos & asbestos containing products

Algeria	Denmark	Ireland	Mozambique	Seychelles
Argentina	Egypt	Israel	Netherlands	Slovakia
Australia	Estonia	Italy	New Caledonia	Slovenia
Austria	Finland	Japan	Nepal	South Africa
Bahrain	France	Jordan	Norway	Spain
Belgium	Gabon	Korea (South)	Oman	Sweden
Brunei	Germany	Kuwait	Poland	Switzerland,
Bulgaria	Gibraltar	Latvia	Portugal	Singapore
Chile	Greece	Lithuania	Qatar	Taiwan
Croatia	Honduras, Hong Kong	Luxembourg	Romania	Turkey
Cyprus	Hungary	Malta	Saudi Arabia	United Kingdom
Czech Republic	Iceland	Mauritius	Serbia	Uruguay

France banned the production and import of asbestos-based products in 1997, followed by Belgium in 1998. During November 1999, UK prohibited the use, import and manufacture of chrysotile asbestos on the grounds of health risks.³² **Nepal banned the asbestos on 22nd December 2014 with 6 moth exemption period and hence took effects on 20th June 2015.**

3. Import and consumption of asbestos per year (total and per major uses and forms)

Nepal did not process and mines the asbestos but import a large quantity of the same for different uses and purposes as there are various Asbestos Sheet Dealers all over Nepal³³.

Asbestos is not mined in Nepal. So all the asbestos, asbestos containing products has been imported and consumed. Nepal does not export the asbestos and hence whatever it imports is being consumed in the country in different sectors housing to industrial etc.

3.1 Importation and Consumption of Asbestos in Nepal

According to the information obtained from Department of Custom, Ministry of Finance, Government of Nepal, different amount of Asbestos has been imported from various countries to Nepal. Following table gives the asbestos importation to Nepal³⁴.

31 http://ibasecretariat.org/alpha_ban_list.php

32 Indian Mineral Year book 2011

33 Classified Bits.com ,the List of Top & Best Asbestos Sheet Dealers in Nepal

34 Import data from Department of Custom , Government of Nepal, [http://www.customs.gov.np/upload/documents/for_Web_FTS_\(UptoJestha_2072_73\)_Final_2016-06-22-14-52-06.xlsx](http://www.customs.gov.np/upload/documents/for_Web_FTS_(UptoJestha_2072_73)_Final_2016-06-22-14-52-06.xlsx)

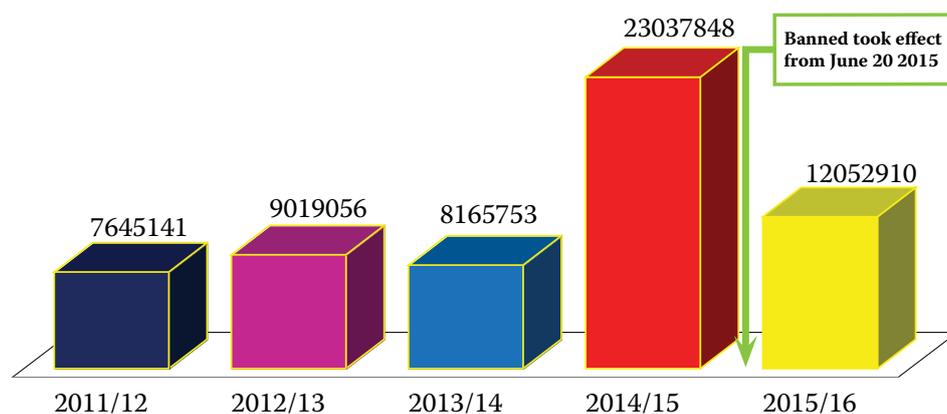
Table 4. Importation of Asbestos and Asbestos containing products in Nepal through Custom

No.	HS Codes	Description	Fiscal Year 2068/69 (Kg)	Fiscal Year 2069/70 (Kg)	Fiscal Year 2070/71 (Kg)	Fiscal Year 2071/72 (Kg)	Fiscal Year 2072/73 (Kg)
		Mid-July to Mid-July	2011/12	2012/13	2013/14	2014/15	2015/16***
1	25241000	Crocidolite Asbestos	83670	111940	63000	130400	00
2	25249000	Other Asbestos	1160411	1084645	721906	547495	229,839
3	68114000	Article of asbestos-cement containing asbestos	3276110	3897735	4198768	8090262	2,286,165
4	68118100	Corrugated sheets not containing Asbestos	2023555	2206565	1152679	10680673	5,552
5	68118200	Other sheets, panels, tiles and similar articles, not containing asbestos	481468	1179645	1300025	2672574	8,418,298
6	68118300	Tubes, pipes and tube or pipe fittings, not containing asbestos	33392	28160	00	00	00
7	68118900	Other articles, not containing asbestos	71414	24871	4281	84619	469,899
8	68128000	Fabricated asbestos fibres & mixtures of crocidolite	2269	6345	4930	9338	2,122
9	68129100	Other fabricated asbestos fibres, clothing, clothing acces	11841	12167	18785	10783	4,826
10	68129200	Other fabricated asbestos fibres, paper, millboard and fel	6526	7525	11358	24701	24,148
11	68129300	Other fabricated asbestos fibres, compressed asbestos fibre	17446	14167	22493	20796	15,749
12	68129900	Other fabricated asbestos fibres, nes ...	23308	22699	44632	50127	42,352
13	68132000	Frictional material & articles there of containing asbestos	41338	1370	5201	14064	18,627
14	68138100	Brake linings and pads, not containing asbestos.....	410379	420699	606251	669302	518,650
15	68138900	Other friction material & article, not containing asbestos.	2014	523	11444	32714	16,683
		TOTAL	7645141	9019056	8165753	23037848	12052910

Sources: Department of Custom , Nepal Foreign Trade Statistics Books and Websites

NOTE: 68118100 are imported though Darbandi No. for non-asbestos, Custom Office found to be imported the Asbestos sheet under this heading (putting Asbestos in brackets) as confirmed by the Computer Operator at Custom Office. It might be the case with all other material said to be not containing asbestos

***LAST column is the import of asbestos after effective date of Government of Nepal banning decision through Custom Offices



Total Asbestos Import (Kg) (DOC, MOF, GON)

3.2 Magnitude of Asbestos worldwide and in Nepal

Another study³⁵ of Mineral Industry Survey of World Asbestos consumption from 2003 through 2007 shows long legacy of the import of Asbestos products in Nepal and elsewhere. According to this survey, the consumption of asbestos in Nepal over the period of 2003 to 2014 has been tabulated here.

Table 5. World Asbestos Consumption from 2003 to 2014

		World Asbestos Consumption 2003 to 2014 (Metric Tons)													
Region & Country	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015		
Africa	28,600	-17,900	63,400	44,400	61,700	13,000	12,000	16,800	14,500	10,400	8,550	11,621	37,59		
Asia and Middle East	1,070,000	1,180,000	1,180,000	1,100,000	1,220,000	1,940,000	1,690,000	1,780,000	1,760,000	1,388,782	1,830,000	1,767,151	1,762,573		
Central and North America	58,200	32,200	87,300	50,200	67,700	9,010	24,700	-12,800	-6,300	282,58	12,700	14,600	17,083		
Europe	857,000	806,000	759,000	634,000	621,000	88,800	94,500	83,900	81,400	32,9921	47,300	31,624	25,195		
Oceania	20	2	1	-337	< 0.5	-	-	20	45	34	-	26	49		
South America	96,300	91,000	170,000	167,000	107,000	152,000	159,000	194,000	219,000	204,175	207,000	200,711	218,264		
Other Area (non specified)	3,610	4,500	2,610	2,410	1,720	-588	-588	2,000	2,000	120	854	854			
Grand Total	2,110,000	2,100,000	2,260,000	1,990,000	2,080,000	2,200,000	1,980,000	2,060,000	2,070,000	1,961,728	2,100,000	2,026,588	2,026,921		
Nepal	25	9	116	42	89	-	-	-	-	137	-	53	252		

NOTE: A negative number indicates net export during the particular year may not add to total owing to independent founding

NOTE: The import data which is equivalent to consumption in case of Nepal as per the record of Government of Nepal, Ministry of Finance, Department of Custom differs from the record of world asbestos consumption based on USGS. These are once again differs from the import and export data between Nepal and India as per their Mineral Year Books. There is no way to verify these data among and between the sources.

³⁵ <http://minerals.usgs.gov/minerals>, Mineral Industry Survey of World Asbestos consumption from 2003 through 2007, USGS

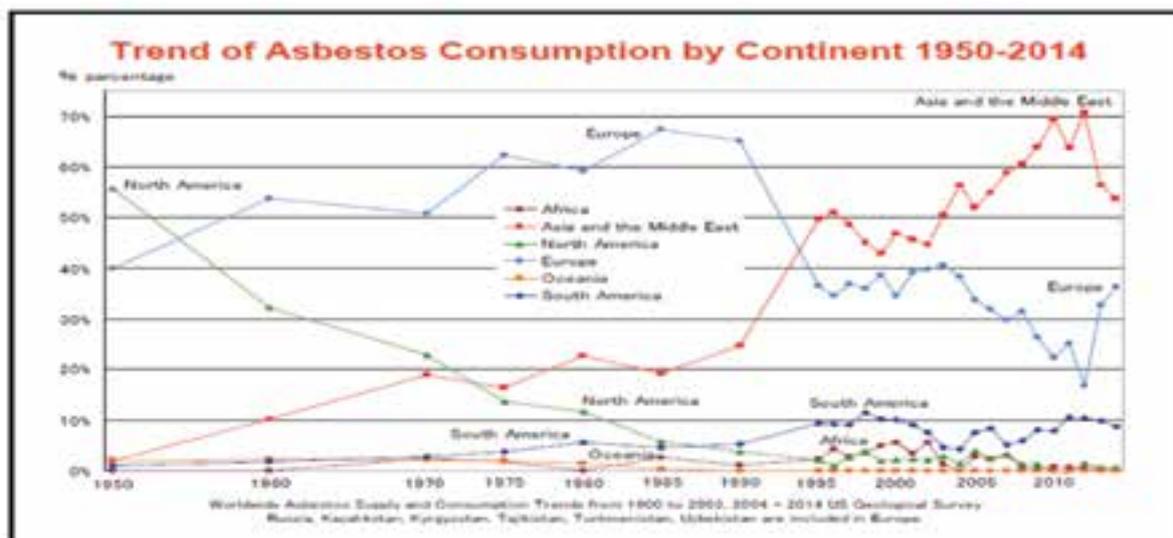


Figure 9. World Asbestos Consumption

Despite widespread knowledge of the hazards of asbestos and bans on any use of asbestos in more than 60 countries, an estimated 2 million tons of asbestos continue to be used around the world each year. Although this amount is significantly less than peak annual consumption of nearly 5 million tons two decades ago, significant amounts of asbestos are still used in India, China, Russia, and some developing countries. This use of asbestos is responsible for disease today and will cause still more asbestos-related disease in the years ahead. All forms of asbestos pose grave dangers to human health. All are proven human carcinogens. There is no continued justification for the use of asbestos. Its production and use should be banned worldwide³⁶.

4. Import of asbestos-containing materials

Asbestos and asbestos containing products has been imported under following product harmonisation codes in Nepal from India, China, Hong Kong, Thailand, United Kingdom, and United States etc. Its quantity has been mentioned in the above table.

Table 6. Import of Asbestos and Asbestos containing materials from different countries

No.	HS Codes	Description	Import from 2014/15	Import from 2015/2016
1	2524.10.00	Crocidolite asbestos	India	India
2	2524.90.00	Other Asbestos	India	India
3	6811.40.00	Article of asbestos-cement containing asbestos	China, India, Thailand	Thailand , India
4	6811.81.00	Corrugated sheets not containing Asbestos	China , India	India, China
5	6811.82.00	Other sheets, panels, tiles and similar articles, not containing asbestos	China, India, Switzerland, Thailand	Thailand, China, India, US
6	68118300	Tubes, pipes and tube or pipe fittings, not containing asbestos	India	India
7	6811.89.00	Other articles, not containing asbestos	India	India

36 <http://www.sciencedirect.com/science/article/pii/S2214999614003191>, (The Global Spread of Asbestos, Arthur L. Frank, MD, PhD¹, , T.K. Joshi, MBBS, MS (Surgery), MSc (LSHTM)²

No.	HS Codes	Description	Import from 2014/15	Import from 2015/2016
8	6812.80.00	Fabricated asbestos fibres & mixtures of crocidolite	China, India, UK,	India
9	6812.91.00	Other fabricated asbestos fibres, clothing, clothing acces	China, India	China, India
10	6812.92.00	Other fabricated asbestos fibres, paper, mllboard and fel	China, India	China, India
11	6812.93.00	Other fabricated asbestos fibres, compressed asbestos fibr	China, India	India
12	6812.99.00	Other fabricated asbestos fibres, nes_	China, India, US	Hong Kong , China, India
13	6813.20.00	Frictional material & articles there of containing asbestos	China, India, Korea,	India
14	6813.81.00	Brake linings and pads, not containing asbestos.....	China, India, Germany, Japan	China, Japan, India
15	6813.89.00	Other friction material & article, not containing asbestos.	India	India, China

NOTE: 68118100 is though Darbandi No. for non-asbestos, Custom Office found to be imported the Asbestos sheet under this heading (putting Asbestos in brackets)

Exports of asbestos from India to Nepal were 252 tonnes in 2010-11 as compared to 559 tonnes in the previous year. Out of the total exports in 2010-11, exports of chrysotile asbestos were 43 tonnes while those of other asbestos varieties were 209 tonnes. Exports were mainly to Nepal. Exports of asbestos-cement products from India to Nepal were 46,882 tonnes in 2010-11 as compared to 39,389 tonnes in the preceding year³⁷.

Table 7. Export of Asbestos and Asbestos Cement products from India to Nepal

Indian Export Asbestos and Related products to Nepal from 2009 to 2014										
Country	2009-2010		2010-2011		2011-12		2012-13		2013-14	
	Qty (t)	Value (IRS 000)	Qty (t)	Value (IRS 000)	Qty (t)	Value (IRS 000)	Qty (t)	Value (IRS 000)	Qty (t)	Value (IRS 000)
A	Exports of Asbestos (total)									
All Countries	559	1601	252	698	1296	2862	78	727	96	486
Nepal	533 (95.3%)	1209	209 (82.9%)	390	124 (9.6%)	487	26 (33.3%)	392	94 (98%)	467
B.	Export of Asbestos (Chrysotile)									Export of Asbestos (fibers)
All Countries	63	805	43	97					22	221
Nepal	54 (85.7%)	781	43 (100%)	97					22 (100%)	221
C.	Exports of Asbestos (Others)									
All Countries	496	796	209	601	1276	2667	73	725	74	266
Nepal	479 (96.6%)	427	166 (79.4)	292	119 (9.3%)	430	26 (35.6%)	392	72 (97.3%)	246

37 .Indian Minerals Yearbook 2011, Part II, 50th Edition, Asbestos, Govt. of India, Ministry of Mines, Indian Bureau of Mines , October 2012, p 8-9

Country	2009-2010		2010-2011		2011-12		2012-13		2013-14	
	Qty (t)	Value (IRS 000)	Qty (t)	Value (IRS 000)	Qty (t)	Value (IRS 000)	Qty (t)	Value (IRS 000)	Qty (t)	Value (IRS 000)
D	Exports of Asbestos Cement Products									
All Countries	39389	547369	46882	606450	41304	883930	56406	1043640	77129	1245602
Nepal	5226 (13.3%)	81780	2612 (6%)	43353	2691 (6.5%)	42975	9730 (17.3%)	176530	11141 (14.5%)	132146
Source	Indian Minerals Yearbook 2011, Part II, 50th Edition, Asbestos, Govt. of India, Ministry of Mines, Indian Bureau of Mines, October 2012, p 8-9				Indian Mineral Year Book 2012, Asbestos, 51st Edition, February 2014, p 2-8		Indian Mineral Year Book 2013, 52nd Edition, Asbestos July 2015, p 2-8		Indian Mineral Year Book 2014, 53rd Edition, Asbestos, December 2015, p 2-8	

From table, it is clear that most of the asbestos products in India are just exported to Nepal only while in case of asbestos cement products exportation to Nepal is less in comparison to other countries from India.

5. Domestic production of asbestos (if applicable)

There is no any known domestic production of asbestos in Nepal as it did not mines and process any kinds of asbestos. Magnesite is the most important raw material for fire-proof products. China is the largest producer of magnesite and talc (Weber, 2003). Magnesite deposits form in sedimentary rocks or occur as altered products of magnesium-rich igneous rocks. The alteration process commonly also forms talc and asbestos. Magnesite is mined from old lakes at Kunwarara, Australia. Similar significant sedimentary magnesite deposits are present in the Haicheng region, China and Proterozoic igneous magnesite-talc deposits are present in the Cobb Valley, New Zealand, and in Afghanistan and Nepal. In China and India, Proterozoic sedimentary rocks host magnesite-talc, deposits, for example the Achin, deposit Afghanistan. Paleozoic mineral deposits include serpentinite-hosted magnesite-talc deposits in New Zealand. Hydrothermal talc and asbestos deposits also are present in China³⁸.

Kharidhunga area of Lakuridanda-8 in Dolakha district. There is a stock of 180 million MT of magnesite and 300,000 MT of talc. The stock is said to be sufficient for 200 years even if high quality magnesite is used to produce the dead burnt magnesite (DBM).

The factory is situated in Makha of Sindhupalchok district. Magnesite is used in the production of refractory bricks for kiln lining, fused magnesia, magnesium metal, fertilizer, animal feed, medicine and industrial chemicals, among various other items.

Nepal Quartz, limestone, copper, cobalt, iron, magnesite

Kharidhunga, Nepal 27.6333 85.9417 Magnesite-talc Uncertain ESCAP, 1993b

38 <http://pubs.usgs.gov/of/2005/1294/c/OFR2005-1294C.pdf>

6. Domestic production of asbestos-containing materials

There is no any known domestic production of asbestos containing materials in Nepal as it did not have any asbestos based production industries establishment in Nepal. However, raw asbestos, asbestos spraying materials, asbestos felts, asbestos containing insulation and chimney materials, asbestos containing corrugated/plane sheets, asbestos papers, asbestos containing cement pipes, boards, asbestos pacing and gaskets, asbestos textiles, cloths, strings, tapes and ribbon, asbestos containing paints, sealing materials, adhesive; asbestos containing friction materials (brake pads etc.) others asbestos materials (rock wool, vermiculite, talc, wire, kerosene heater wick etc. products are being imported and used in Nepal .

7. Estimated total number of workers exposed to asbestos in the country

Estimation of workers exposed to asbestos has not yet been made by government and/or private sectors. However, Labor and Employment Policy required reporting and documentation system on occupational hazards, training in occupational safety and health will be provided for workers and management personnel.

Nepal did not have any factory especially on the asbestos production but workers are definitely getting exposed in the use sectors e.g. Roofing and other Industries (e.g. Sugar mills where Asbestos/containing products has been reported to be used).

The table below gives the industrial establishments and number of person engaged and numbers of employments in manufacturing establishment of Nepal³⁹.

Table 8. Industrial establishments with number of person engaged and employed

Particular	Census of Manufacturing Establishments (CME) Years				
	1991/92	1996/97	2001/02	2006/07	2011/12
1 Total number of establishments	4,271	3,557	3,213	3,446	4,076
2 Total number of persons engaged	223,463	196,708	191,853	177,550	204,360
3 Total number of employees	213,653	187,316	181,943	169,891	194,989
4.Average number of employee per establishment	50	53	57	49	48

8. Full list of industries where exposure to asbestos is present in the country and list of industries with the largest numbers of workers potentially exposed to asbestos

Nepal did not have any factory especially on the Asbestos production but workers are definitely getting exposed in the industry which uses the asbestos, asbestos containing products and process.

Nepal dis not have developed recognition criteria for asbestos related diseases. However, following types of works are considered to be asbestos work and likely have potential to exposed to asbestos.

³⁹ National Census of Manufacturing Establishments, Nepal , GON, NPC Secretariat, CBS, June 2014, p 4,6

- Mining , carrying or crushing of asbestos containing minerals , rocks, waste handling
- Handling of asbestos containing cements and products
- Involvement in the manufacturing of the following asbestos containing materials
- Asbestos containing textiles e.g. asbestos yarn, asbestos cloths etc.
- Asbestos containing cement or products made from such cement including slate, high pressure piping, cylinders etc. .
- Asbestos containing thermal resistance products used for lagging of boilers, joint sheets in internal combustion engines, as gaskets (packing) etc.
- Asbestos containing wear-resistant (friction) products including brake lining for cars, hoisting machines etc.
- Asbestos containing paper used for electrical insulation, thermal insulation or because such paper is acid-resistant etc.
- Asbestos containing products such as asbestos felt (used to insulate electric wires; as a general insulation materials ; or to impart acid-resistance to construction materials and
- Asbestos containing products such as electrolytic diaphragms, tile sealing materials, tiles, plasters (etc.) and paints (etc.).
- Asbestos spraying
- Handling of an asbestos containing products used to impart thermal protection or insulation
- Processing (cutting etc.) of asbestos containing products
- Maintenance or demolition of a building in which an asbestos containing products has been used as lagging or as a building materials , or work in an adjunct facility.
- Maintenance or demolition of a vehicle containing asbestos containing products
- Handling of a minerals (talc etc.) containing asbestos as an impurities
- Other works involving exposure to asbestos dust to an extent that was the same or in excess of the exposure level created by participation in the types of work listed above.
- Working involving indirect exposure to asbestos dust, including working at the periphery of a place which any of these types of works described above took place.

9. Industries with high risk of exposure (where overexposure is documented as exceeding occupational exposure limits) and estimated total number of workers at high risk

Country neither has documentation on the exposure risks to asbestos nor has fixed any occupational exposure limits for the asbestos fibers. So it is not possible to estimate total numbers of workers who are at high risks of asbestos exposure.

9.1 Brake Lining and Repair Center and Workers

There are number of hotspots of asbestos related waste and possibilities of getting increased level of asbestos



Figure 10 Brake Shoe asbestos lining workshops in KTM

exposure during the brake lining and repairing centres available in major urban centres. Capital city Kathmandu alone have about half a dozen of brake lining and repair centres that uses a lot of different varieties of the asbestos lining and under severe threat of getting higher level of exposure.

Following are the brake lining workshops exist in the Kathmandu Valley about 30 to 50 personnel's engaged in such work are susceptible of developing asbestos related diseases.

Brake Lining fixing workshops (Dealers/Shops)

- (a). Panchkanya Workshop (In front of Chabhil, NTC Building)
- (b). Sholti Mod
- (c). Shoyambhoo Sano Bharyang
- (d). Gowarko (opposite to B & B Hospital)
- (e). Balaju (next to Naya Bajar Bridge)
- (f). Bansghari, Putlisadak (Mr. Laxman Dangol, 9841326345)

Brake Lining Sales (Dealers/Shops)

- (a). Lazimpat (Behind the Hotel Gyanjong)
- (b). National Auto Parts, Kalimatti (RANE Brake Shoe Dealer 9808275880)

The recent study of asbestos in workshops dust and accessories indicates high level of asbestos contamination in the working place thus having high potential of getting exposure.



Figure 11. Pictures of Asbestos lining Materials, Worker and Waste at Working station, Putalisadak, Kathmandu

10. Estimate of the burden of diseases related to asbestos: disability adjusted life years (DALYs) and deaths attributable to asbestos exposure

No any country specific data on Asbestos Related Disease (ARD) based on Nepalese study. But WHO Global Burden of Diseases (GBD) have some figure clearly indicating increased number of death cases in Nepal due to asbestos exposure. There is thumb rule of 170 tons equivalent of 1 Mesothelioma Case and based on this thumb rule as well, many mesothelioma cancer cases would have been occurred.

Additionally, Doctors working in specialized Cancer hospital of Nepal said that there was some case of Mesothelioma found and undergone the treatment, but it is about to impossible to extract exact record and associated other information of the patients as they might have mixed with other types of cancer e.g. Lung Cancer and with other type of cancer. So it is not possible at the moment to come with the estimate of the burden of diseases related to asbestos and disability adjusted life years (DALY` s) and exact numbers of deaths attributed to asbestos exposure for sure.

Asbestos Related Disease (ARD) and disability adjusted life years (DALY` s) based on estimated of global burden of diseases of WHO can be found in Annex 3.

11. Prevalence of asbestosis (total number of workers with diagnosed asbestosis, asbestos-related lung cancer and mesothelioma to-date) – national data, a breakdown by industries if available

No data on prevalence of asbestos, asbestos related lung and mesothelioma available in the country.

12. Incidence of lung cancer among workers exposed to asbestos

Though there is no population based national record of cancer, it is established that incidence of cancer is approximated at 100-120 per 100000 and the assumption is there are 55000-60000 cancer patients at any point of time in the country.⁴⁰

The asbestos related cancer cases have yet to be delineating from total recorded cancer bronchus and Lung cancer so far identified in Nepal as of 2003 to 2013.

Table 9. Total recorded cancer bronchus and Lung cancer in Nepal from 2003 to 2013.

Bronchus & Lung Cancer (C34)	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total	%
Male	262	373	377	396	626	584	595	589	582	579	664	5627	60.89
Female	176	229	250	283	369	334	340	353	391	398	492	3615	39.11
Total	438	602	627	679	995	918	935	942	973	977	1156	9242	100

BPKMCH, Newsletter, Yr 18, No.1, Sept. 2015, ISSN IBII -9530 and Detail Findings of National Cancer Registry 2013

Additionally total cancer cases in the project area as there are patients who have undergone treatment of Mesothelioma but grouped under lung cancer. The project area (10 Districts of Central Development Region to Eastern Development Region from Parsa to Morang districts) has relatively large number of cancer cases as per the consolidated record of 13 hospitals that serves the cancer patients all over Nepal (2013).

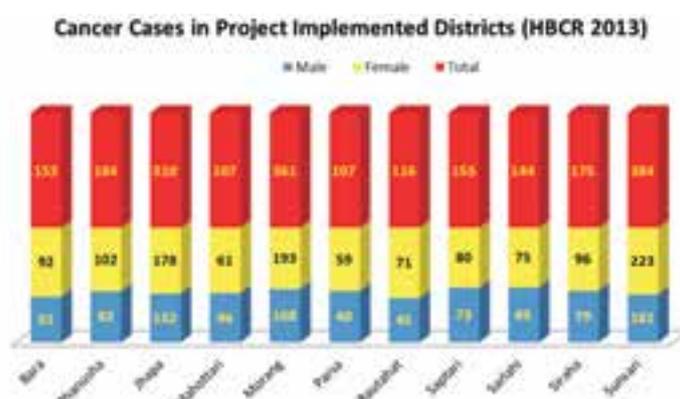


Figure 12. Cancer cases in 10 Project Implemented districts of Terai, Nepal (Central to Eastern Development Region of Nepal)

Distribution of cancer based on Occupation basis⁴¹. In the year 2013, out of 8729 cancer cases, 2755 (31.6%) cases were from agricultural sector and 1912 (21.9%) from the housework and followed by 392 (4.5%), 273 (3.1%), 221 (2.5%) were from others, office work, and business respectively. Whereas 320 (43.7%) were not applicable and 2856 (32.7%) were not available.

Table 10. Distribution of cancer cases by occupational

Occupational Status	Distribution of cancer cases by occupational status & sex					
	Sex				Total	
	Male		Female			
	#	%	#	%	#	%
Agriculture	1603	40.0	1152	24.4	2755	31.6
Business	140	3.5	81	1.7	221	2.5
Housework	243	6.1	1669	35.4	1912	21.9
Office work	195	4.9	78	1.7	273	3.1
Others	241	6.0	151	3.2	392	4.5
Not applicable	195	4.9	125	2.6	320	3.7
Not available	1394	34.8	1462	31.0	2856	32.7
Total	4011	100.0	4718	100.0	8729	100.0

Distribution of Cancer Cases according to Gender from 2003 to 2013 in Nepal⁴²

Table 11. Distribution of Cancer Cases according to Gender from 2003 to 2013 in Nepal

Gender	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total	%
Male	1488	2030	2057	2325	2758	2702	2970	3192	3295	3291	4011	30119	46.52
Female	1763	2171	2340	2583	3277	3247	3229	3581	3793	3921	4718	34623	53.48
Total	3251	4201	4397	4908	6035	5949	6199	6773	7088	7212	8729	64742	100

41 Detail Findings of National Cancer Registry 2013, Kishore Pradhananga, BPKMCH, Bharatpur, Chitwan.

42 BPKMCH, Newsletter, Yr 18, No.1, Sept. 2015, ISSN IBII -9530 and Detail Findings of National Cancer Registry 2013

13. Incidence of mesothelioma

According to existing cancer cases recorded of cancer registry in Nepal, there are no clear identified cases of Mesothelioma cancer. However, based on the personal communication with Doctors (Dr. Bhola Rauniar)as well as Officials (Mr. Kishore Kumar Paradhangnga) of BPKMCH, Bharatpur, Chitwan and Dr. Sunil Kumar Joshi , KMC , Kathmandu , there were cases of Mesothelioma cancer in Nepal. Record keeping of these specific cancer cases has not been maintained separately and hence it is hard to identify these cases. But the WHO global burden of diseases estimates increased incidence of mesothelioma cases as death causes among Nepalese due to exposure to asbestos.

13.1 WHO Global Burden of Diseases (GBD) Estimates⁴³

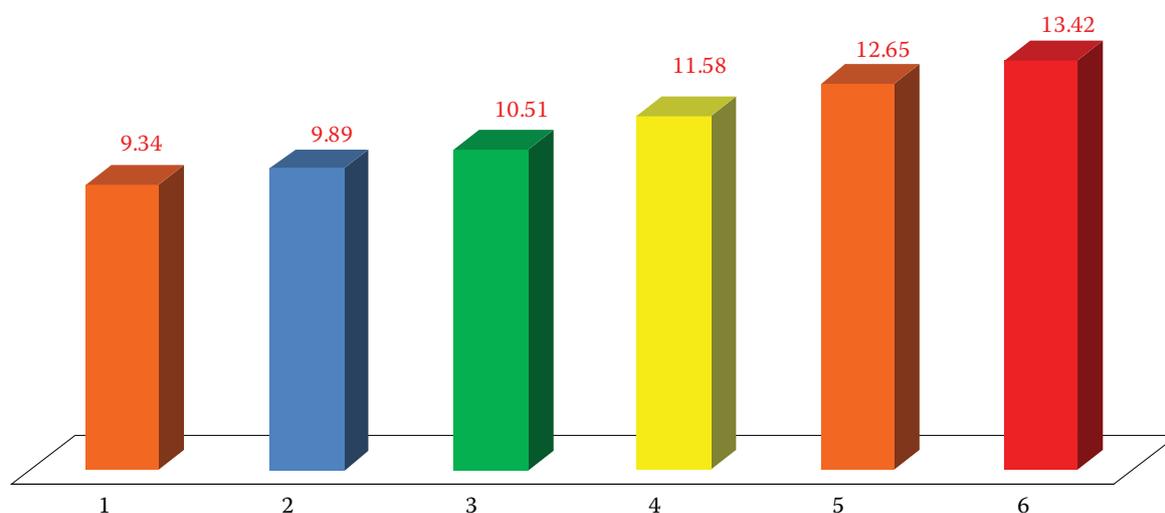


Figure 13. Death of People from Occupational Exposure to Asbestos in Nepal
<http://vizhub.healthdata.org/gbd-compare/>

Nellie Kershaw (c. 1891 – 14 March 1924) was an English textile worker from Rochdale, Greater Manchester. Her death due to pulmonary asbestosis was the first such case to be described in medical literature, and the first published account of disease attributed to occupational asbestos exposure. Before his publication of the case in the *British Medical Journal*, Dr William Edmund Cooke had already testified at Kershaw's inquest that "mineral particles in the lungs originated from asbestos and were, beyond reasonable doubt, the primary cause of the fibrosis of the lungs and therefore of death". Her employers, Turner Brothers Asbestos, accepted no liability for her injuries, paid no compensation to her bereaved family and refused to contribute towards funeral expenses as it "would create a precedent and admit responsibility". She was buried in an unmarked pauper's grave. The subsequent inquiries into her death led to the publication of the first Asbestos Industry Regulations in 1931.

(https://en.wikipedia.org/wiki/Nellie_Kershaw)



43 <http://vizhub.healthdata.org/gbd-compare/>

14. Estimates on the percentage of house stock and vehicle fleet containing asbestos

14.1 House Stock containing asbestos

Housing, one of the basic needs of human being is also an indicator of the wellbeing of a person or household. A house or a dwelling unit is an independent free-standing structure comprising one or more rooms or space, covered by a roof and usually enclosed within walls or dividing walls that extend from the foundation to the roof. It is designed for residential, agricultural, commercial, industrial, or cultural purposes, or for the provision of services. Average number of rooms per household for Nepal as per the survey results are 4.7 (4.4 in urban and 4.7 in rural area). Seventeen percent of the households have reported to have one or two rooms, 36 percent had 3 or 4 rooms, 29 percent had 5 or 6 rooms, 13 percent had 7 or 8 rooms and 5 percent had 9 or more.

Roof, Nearly one third (31.2%) of the households live in a house with roofed of galvanized/corrugated iron sheets in Nepal, 24.9 percent in urban and 33.4 percent in rural area . Twenty six percent (26.5%) have concrete roofing, 65.4 percent in urban and 17.2 percent in rural area. In rural area, 16.5 percent have straw/thatch roofing. Three out of four households of poorest group have roofs made of either tiles/slates or straw/thatch or earth/mud or else.⁴⁴

Table 12. Percentage distribution of households by the construction materials of roof

Nepal	Concrete/Cement	Galvanized Iron	Wood/planks	Tiles/Slate	Straw/thatch	Earth/mud	Others	Total
Urban	65.4	24.9	0.5	6.7	1.3	0.0	1.2	100
Rural	17.2	33.4	1.0	23.1	16.5	0.9	7.9	100

Total Household in Nepal⁴⁵

Central Bureau of Statistics (CBS) Nepal has brought the results of the National Population and Housing Census 2011 (NPHC 2011). According to them, there were all together 5423297 households in Nepal including urban household 1045575 (19.3%) and rural households are 4377722 (80.7%). According to annual household survey of CBS 2013/14, average number of rooms per household for Nepal as per the survey results are 4.7 (4.4 in urban and 4.7 in rural area). Thus there is a total of 25175793 house stock in Nepal. Considering only 20 percent of the houses have asbestos roofing in mostly in rural setting 5035158 houses might be having toxic asbestos roofing.

Table 13. House Stock containing asbestos

Nepal	Households (HH)	Percentage	No. of Rooms/HH	Total rooms	Total Rooms with asbestos Roofing	Assumptions Remark about Asbestos roofing
Urban	1045575	19.30%	4.4	4600500	920100	20% of rooms
Rural	4377722	80.70%	4.7	20575293	4115058.65	20% of rooms
National Total	5423297	100%		25175793	5035158.65	20% of rooms

44 Annual Household Survey 2013-14_REPORT_Major Findings, August 2015, CBS/NPC

45 National Population and Housing Census 2011, Household Tables, Volume 04, NPHC 2011

Nepal	Households (HH)	Percentage	No. of Rooms/HH	Total rooms	Total Rooms with asbestos Roofing	Assumptions Remark about Asbestos roofing
Ecological Belt						
Mountain	363,698	6.70622	4.7	1709380.6	17093.806	1% of rooms
Hill	2,532,041	46.68822	4.7	11900592.7	238011.854	2% of rooms
Terai	2,527,558	46.60556	4.7	11879522.6	4787447.608	40% of rooms
National Total	5,423,297	100		25489495.9	5042553.268	About 20 %

14.2 Vehicle fleet containing asbestos

Department of Transport Management was established in 2041 B.S. for the smooth management of transport. The purpose of this department and its affiliation, as per Vehicle and Transport Management Act 2049 and Vehicle and Transport Management Rules 2054, is to provide safe, reliable and easy transportation service to the public and goods carrier.

Table 14. Vehicle fleet containing asbestos in their brake shoe and brake pads

Type of Vehicle ¹	Up to 2000	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
Bus/Mini bus/Micro bus	14507	1453	1163	962	1853	1622	2257	2508	2629	2564	2810	3095	3410	4749	4366	5581
Car/ jeep Van / Pickup	54963	5152	4374	3487	7557	4781	5150	5892	6329	8144	14243	8510	8711	9595	17040	16068
Crane/Dozer /Truck	21309	1271	1798	1212	1477	1592	2263	3278	3594	3643	4524	1969	1333	3332	2789	3269
Tractor	21072	3519	3189	2485	2191	1374	635	2942	3297	4663	11460	7937	8413	9795	10070	8461
Tempo	6702	232	248	17	16	48	60	12	18	20	9	2	10	57	17	1239
Motorbike	150185	29291	38522	29404	26547	31093	45410	72568	69666	83334	168707	138907	145135	175381	163945	167340
others	3715	77	86	43	58	21	0	1536	205	202	31	133	91	152	116	70
Total	272453	40995	49380	37610	39699	40531	55775	88736	85738	102570	201784	160553	167103	203061	198343	202028

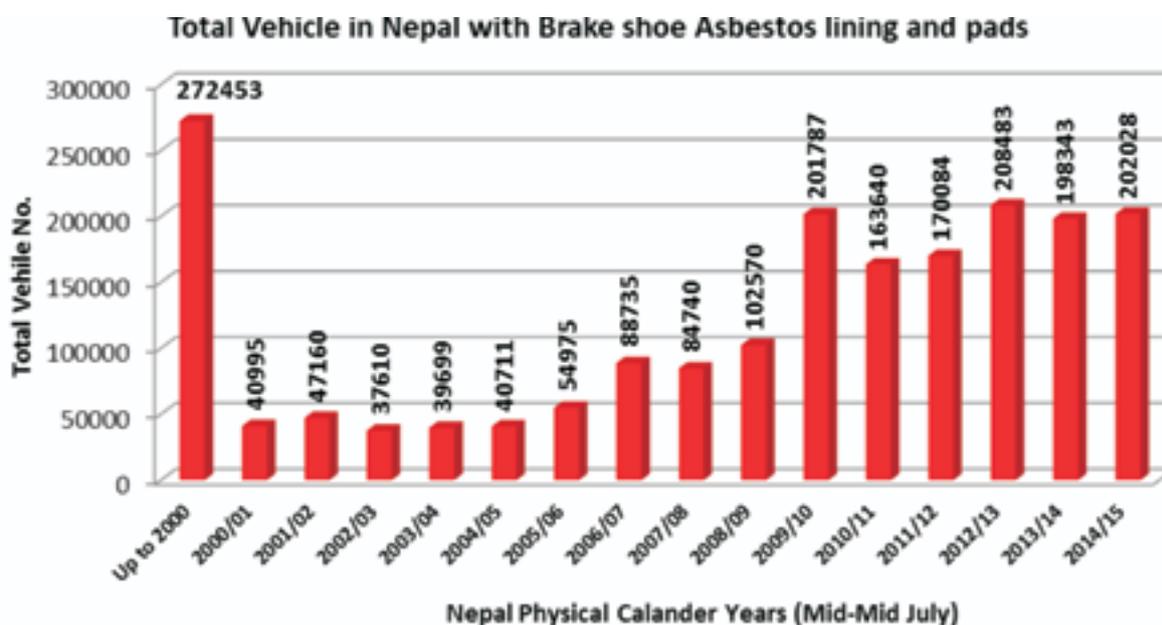


Figure 14. Vehicle Fleet in Nepal

15. Total number of workers eligible for compensation for asbestos-related diseases, such as asbestosis, lung cancer and mesothelioma (per year) and the numbers of individuals compensated yearly

There is no formal identification of asbestos related diseases such as asbestosis, lung cancer and mesothelioma has been made so far linked to any particular industries and/or occupational exposure and hence workers eligible for compensation for this has not been realized yet. However, there are cases of mesothelioma cases in Nepal as per the health care professional experiences as well as based WHO global burden of diseases estimates.

16. National enforceable occupational exposure limits for Chrysotile asbestos

There is no any national enforceable occupational exposure limits for Chrysotile asbestos has yet been enacted in Nepal. Need to be formulated as earliest possible with monitoring mechanism in place.

17. The system for inspection and enforcement of the exposure limits

There is no any system for inspection and enforcement of the exposure limit as there is absence of enforceable occupational exposure limits for asbestos in Nepal. Need to be formulated as earliest possible with system for inspection and enforcement of the exposure limit in place.

17.1 Systems for Monitoring asbestos uses and surveillance of ARD`s;

There are no any system for monitoring asbestos uses and surveillances of ARD`s. But based on internally accepted formula, it can be inferred that there might be some diseased cases of asbestos. Additionally, WHO GBD also has estimated increased death cases of asbestos related exposures.

In studies from the Finnish Institute of Occupational Health, at least one case of mesothelioma occurred for every 170 tons of asbestos used. Based on this internationally accepted formula, Asia and the Middle East's current asbestos consumption would lead to 8,000 mesothelioma cases annually.⁴⁶

Based on the same statistics, in case of Nepal, depending on the import of asbestos and asbestos cement in the following years the table given below gives an estimated case of mesothelioma, an incurable form of cancer cases in Nepal.

⁴⁶ <http://www.irinnews.org/report/95121/asia-asbestos-deadly-but-not-yet-banned>.

Table 15. Indian Export Asbestos and Related products to Nepal from 2009 to 2014

Indian Export Asbestos and Related products to Nepal from 2009 to 2014										
Country	2009-2010		2010-2011		2011-12		2012-13		2013-14	
	Qty (t)	Value (IRS 000)	Qty (t)	Value (IRS 000)	Qty (t)	Value (IRS 000)	Qty (t)	Value (IRS 000)	Qty (t)	Value (IRS 000)
A	Exports of Asbestos (total)									
Nepal	533 (95.3%)	1209	209 (82.9%)	390	124 (9.6%)	487	26 (33.3%)	392	94 (98%)	467
B.	Export of Asbestos (Chrysotile)								Export of Asbestos (fibers)	
Nepal	54 (85.7%)	781	43 (100%)	97					22 (100%)	221
C.	Exports of Asbestos (Others)									
Nepal	479 (96.6%)	427	166 (79.4)	292	119 (9.3%)	430	26 (35.6%)	392	72 (97.3%)	246
D	Exports of Asbestos Cement Products									
Nepal	5226 (13.3%)	81780	2612 (6%)	43353	2691 (6.5%)	42975	9730 (17.3%)	176530	11141 (14.5%)	132146
	Total export to Nepal									
	6292		3030		2934		9982		11329	
	Potential Mesothelioma cases in Nepal									
	37		18		17		59		67	
Source	Indian Minerals Yearbook 2011, Part II, 50th Edition, Asbestos, Govt. of India, Ministry of Mines, Indian Bureau of Mines, October 2012, p 8-9				Indian Mineral Year Book 2012, Asbestos, 51st Edition, February 2014, p 2-8		Indian Mineral Year Book 2013, 52nd Edition, Asbestos July 2015, p 2-8		Indian Mineral Year Book 2014, 53rd Edition, Asbestos, December 2015, p 2-8	

NOTE: According to Finnish Institute of Occupational Health, at least one case of mesothelioma occurred for every 170 tons of asbestos used.

18. Estimated economic losses due to asbestos-related diseases

No any estimated economic losses due to asbestos related diseases have yet been made. However, increased health and economic losses might have been occurring in Nepal.

19. Major studies on epidemiology of asbestos-related diseases in the country

No any specific studies on epidemiology of asbestos-related diseases in the country have yet been carried out. However, there are few studies and review has been made on Occupational Safety and Health issues those talks about the asbestos induced diseases but not have any specified cases related to asbestos in Nepal.

20. National capacity for detection, diagnosis and treatment of asbestos related diseases (ARD`s)

20.1 Diseases Associated With Asbestos

Two groups of diseases are associated with exposures to asbestos: nonmalignant diseases, which can be fatal, and cancer.

The nonmalignant diseases associated with exposure to asbestos include asbestos warts, benign asbestosis pleural effusion, and the disease asbestosis. Traditionally, asbestosis involved both the parenchymal of the lung and the pleura, although a more modern view separates pleural disease from parenchymal fibrosis. The nomenclature is of little importance and both pleural and parenchymal fibrosis can lead to death.

The malignant diseases related to asbestos include lung cancer, mesothelioma, ovarian cancer, and laryngeal cancer, as well as a variety of gastrointestinal tract, oro-pharyngeal, and kidney cancers. In some groups, such as insulators, 1 in 5 deaths is due to lung cancer with a documented synergistic effect of smoking. Also among insulators, approximately 10% to 12% of deaths are due to mesothelioma, a disease thought to occur at a background rate of 1 per 1 million, or less.

20.2 The Evolving Epidemiology of Asbestos Disease

Rates of asbestos-related disease are already decreasing in Western developed countries as a result of bans on asbestos use that were imposed several decades ago and can be expected to decrease further in the years ahead. By contrast, however, there is every expectation that rates of these diseases will rise in countries where asbestos use continues or is increasing, and most of these are low- and middle-income countries.

Tracking of trends in asbestos disease is impeded in many developing countries by inadequate disease surveillance systems and by lack of official government recording of such diseases as mesothelioma. For example in India, no official recognition of mesotheliomas has occurred, but one hospital in Mumbai alone has documented more than 30 cases of mesothelioma treated at that hospital in a single year. As is classically appreciated in public health, the lack of data does not mean the lack of disease. Similar situations occur elsewhere, such as in Brazil where there is a vast underreporting of such diseases. It has been estimated that worldwide there is a significant underreporting of diseases by a large margin. In some countries, such as Russia, the government has stopped separate coding for mesotheliomas, whereas in other nations mesotheliomas have now reached the status of being coded separately, and will be able to be more easily tracked.⁴⁷

Despite of having about 13 Cancer treatment facilities, there is virtually lack of confirmed data on cancer patient itself in Nepal. Therefore there are patients given the treatment of mesothelioma cancer but grouped under lungs cancer and hence need to identified among over 8000 cancer patient received treatment only from BPKMCH Bharatpur as per the hospital records(based on personal communication with Mr. Kishore Pd. Dungana and Dr. Bhola Rauniar). Additionally, based on personal communications **with Dr. Sunil Kumar Joshi**, Nepal Medical College, there were 2 identified case of mesothelioma in Nepal about a decade ago and one among them have returned from the migrant workers. According to recent development, Dr. Bhola Rauniar, MBKMCH Bharatpur Cancer Hospital, there are cases of Mesothelioma in Nepal however the record has not been exclusively maintained for this group separately.

47 <http://www.sciencedirect.com/science/article/pii/S2214999614003191>

20.3 National Capacity for Cancer diseases

Cancer incidence is increasing and becoming a leading cause of death worldwide. Deaths from cancers continue to increase worldwide, particularly in countries with low and middle income leading to a global burden. The burden of cancer is not less for Nepal. Cancers of lung, uterine cervix, head & neck, breast and stomach are the most common types in Nepal. The majority of cancer patients were attended only 7 major hospitals of the country at an advance stage.⁴⁸ With increase in the number of cancer patients, numbers of hospital providing cancer related treatments have increased to 13 in number with some specialized facilities for the cancer treatment only in recent years.



Figure 15. National Network for Cancer Treatment Facility

Nepal hosts the specialised Cancer Hospital as well as there are numerous other big hospitals that are providing good detection, diagnosis, treatment to the cancer patients and also having prevention, control and research programs on Cancer. So cancer related national capacity is there in place may need to expand its field of treatment to the Asbestos related diseases as well.

These hospitals provide the wide range of diagnostic, curative and palliative services through different departments and units. Besides curative services, the hospitals provide cancer prevention and early detection services under National Cancer Prevention and Control Programs.

The comprehensive cancer centre being provided as of today from following health care facilities at government and private sectors.

Table 16. Cancer treatment health care facilities in Nepal

S.No.		Health Care Facilities provided cancer treatments in Nepal
1	BPKMCH	B.P. Koirala Memorial Cancer Hospital, Chitwan
2	BPKIHS	B. P. Koirala Memorial Institute of Health Sciences, Dharan
3	BCH	Bhaktapur Cancer Hospital, Bhaktapur
4	BH	Bir hospital/National Academy of Medical Sciences (NAMS), Kathmandu
5	TUTH	Teaching Hospital, Tribhuvan University, Kathmandu
6	KCH	Kanti Children's hospital, Kathmandu
7	MTH	Manipal Teaching Hospital, Pokhara
8	SBH	Shree Birendra Hospital, Kathmandu
9	CSH	Civil Hospital, Kathmandu
10	PH	Patan Hospital, Lalitpur
11	PMWH	Paropakar Maternity & Women Hospital, Kathmandu
12	NTH	Nepalgunj Teaching Hospital, Banke
13	NCHRC	Nepal Cancer Hospital & Research Center ,Lalitpur

48 Kallou Sharma Subedi, M.D., D.M.R.D., Pragma Sharma, M.B.B.S. Department of Radiation Oncology, Graduate School of Medicine, Gunma University-Japan. Department of Radiology, Western Regional Hospital, Pokhara-Nepal. Teaching Hospital, Manipal College of Medical Sciences, Pokhara-Nepal.

B.P. Koirala Memorial Cancer Hospital (or **BPKMCH**)⁴⁹ is a hospital of Nepal located in Bharatpur, Chitwan of Central Development Region. The hospital is one of the very few specialized hospitals outside the Kathmandu valley in Nepal. The hospital was founded by the government in 1992. In 1995, it started offering day services, treating inpatients from 1999. The hospital was equally funded by China and Nepal. The hospital is named for Bishweshwar Prasad Koirala, who served as the first democratically elected Prime Minister of Nepal from 1959 to 1960 and who died of throat cancer in 1982. The hospital is the one of national cancer institute in Nepal entrusted with the responsibilities for diagnosis, treatment, rehabilitation, prevention and research in cancer in Nepal.

Though there is no population based national record, it is established that incidence of cancer is approximated at 100-120 per 100000 and the assumption is that there are 55000 to 60000 cancer patients at any point of time in the country (2014 Annual report).

The hospital provides diagnostic, therapeutic and supportive services to cancer patients. The hospital deals with oncology, radiation oncology, surgical oncology including GI surgery, advanced reconstructive urosurgery, neurosurgery and head neck surgery, gynecological oncology, radiology, pathology, preventive oncology and hospice care. A volunteer organization, Cancer Welfare Society, helps the patients and relatives in need during the hospital stay.

Surgical oncology provides care doing sentinel lymphode biopsy for breast cancers, breast reconstructions and mammography guided needle localization biopsy. In GI surgery, three field lymphadenectomy for carcinoma esophagus, D2 dissection for cancer of stomach, APER for advanced rectal cancers, low anterior resection for low lying rectal cancer is feasible. In urology, cystectomy and reconstruction on orthotopic neobladder is done in suitable candidates. Advanced composite resection and flap reconstructions are done in H&N surgery when required.

The Radiotherapy department uses linear accelerators and eclipse planning systems for the treatment and planning. Medical oncology also uses molecules for treatment of cancer, mainly hematological malignancies.

20.4 On-going research (if any) to address information gaps

As such there is no known level of on-going research on asbestos related subject except CEPHEP has been carried out about the testing of asbestos about its content and type as well as dust sampling to know the exposure level among the asbestos workers in brake shoe lining workshops.

20.5 Occupational Safety and Health Project (OSHP).⁵⁰

An Occupational and Safety and Health Project is on-going at the Department of Labour, Ministry of Labour and Employment, Government of Nepal to develop the culture of Promotion and protection of the physical, mental and social health and wellbeing and physical safety of the workers in any occupation and for which to develop the project as a center capable with resources and equipment to enable the industries to utilize all possible options for potential improvement of their workplace. Its Mission is to develop policy, institutional tripartite mechanism and operational infrastructure for the protection and promotion of safety and health of the workers and prevention, control and / or minimization of two main workplace issues – occupational accidents and diseases adversely affecting

49 http://en.wikipedia.org/wiki/B.P._Koirala_Memorial_Cancer_Hospital

50 http://www.dol.gov.np/osh_project-55-en.html

production and productivity, directly as well as indirectly and to establish tripartite cooperation for the protection and promotion, Control and minimization of occupational accidents and diseases.

21. Country level action plan, partnerships and coordination mechanism to eliminate ARD's

No concrete actions has been initiative by any especially for the asbestos related diseases but there are some good legislative and institutional frameworks in place to address and occupation safety and health issues in Nepal as OSH project under the Ministry of Labour and Employment, Department of Labour supposed to looks overall occupational health related issues including asbestos. Cancer registry initiatives as well as good networks of general cancer prevention, diagnosis and treatments inbuilt general to specialised cancer hospitals are operating in country with modern treatment facilities.

22. Local Action against all form of Asbestos related health and environmental damage

22.1 Research and Awareness Rising about Asbestos in Central and Eastern Terai of Nepal

Since 2013, CEPHED has been following the asbestos issues through its primary level of research and advocacy. It has been prepared and presented the national asbestos short profile in the year 2013 in Asian Asbestos Initiative (AAI 6) in Manila, Philippines with the support of WHO. During this period, there was a pile of truck asbestos waste were burring in the heart of the Kathmandu City. CEPHED took this initiative seriously and rigorously campaign for the safe and sound disposal of these waste as well as advocate for the legislative framework (see Annex 1. CEPHED`s Campaign letter). Government of Nepal banned the import, sale, distribution and uses of all form of asbestos in Nepal.

CEPHED campaign on asbestos did not stops there and currently implementing a research and awareness project with the help of The **Takagi Fund for Citizen Science and International Ban Asbestos Secretariat (IBAS)** with the aim of raising awareness, prepare and disseminate national asbestos profile and compliance monitoring of the government banning decisions etc. This National Profile is a major part of the on-going project. CEPHED



Figure 16. Asbestos waste buried at Maitighar Mandela towards New Baneshwor road extension.

had initiated several round local level compliance monitoring and campaign with the concerned government agencies towards ensuring effective implementation of the ban decision.

22.2 Submitted of Memorandum



Figure 17. Asbestos in Waste stream putting under soil in Capital city Kathmandu

As part of the year 2011 International Workers Memorial Day (IWMD) celebration, on April 30th 2011, a joint delegation of BWI (Building and Wood Workers International)'s Nepal affiliates (CUPPEC, CAWUN and GEFONT)⁵¹ met with the Prime Minister, Jhala Nath Khanal and submitted a memorandum of urging to ban Asbestos in Nepal. The Prime Minister showed keen interest on the issues and seems to have an understanding on the health hazards associated with Asbestos. He assured the unions to initiate consultations with concerned ministries soon. The affiliates on their part have resolved to organise more awareness activities to push for a ban on asbestos in all forms by the Nepal Government,

Earlier on 28th April 2011, the Nepalese affiliates organised an interaction program to commemorate the IWMD. The event was brought together 75 participants from the two BWI affiliates, national trade union centres, Occupational Health and Safety Centre and the Ministry of Labor.

In addition, there were some advocacy campaign were carried out by a NGO called PRO PUBLIC for safe handling and banning of asbestos in Nepal.

23. Health Impacts of Asbestos

Today, asbestos is classified as a known human carcinogen. Asbestos fibers are microscopic (roughly 0.02 diameter of a human hair), and therefore, are easily inhaled. Once inhaled, fibers stick to respiratory system, including lining of lungs and inner cavity tissue. As asbestos fibers are typically quite rigid, they become lodged in soft internal tissue of respiratory system and are not easily expelled or broken-down by body. *There is no safe type of asbestos and no safe level of exposure.* Over time, these fibers can accumulate and cause scarring and inflammation, which can affect breathing and lead to serious health problems (ATSDR 2009).

51 <http://www.bwint.org/default.asp?index=3458>

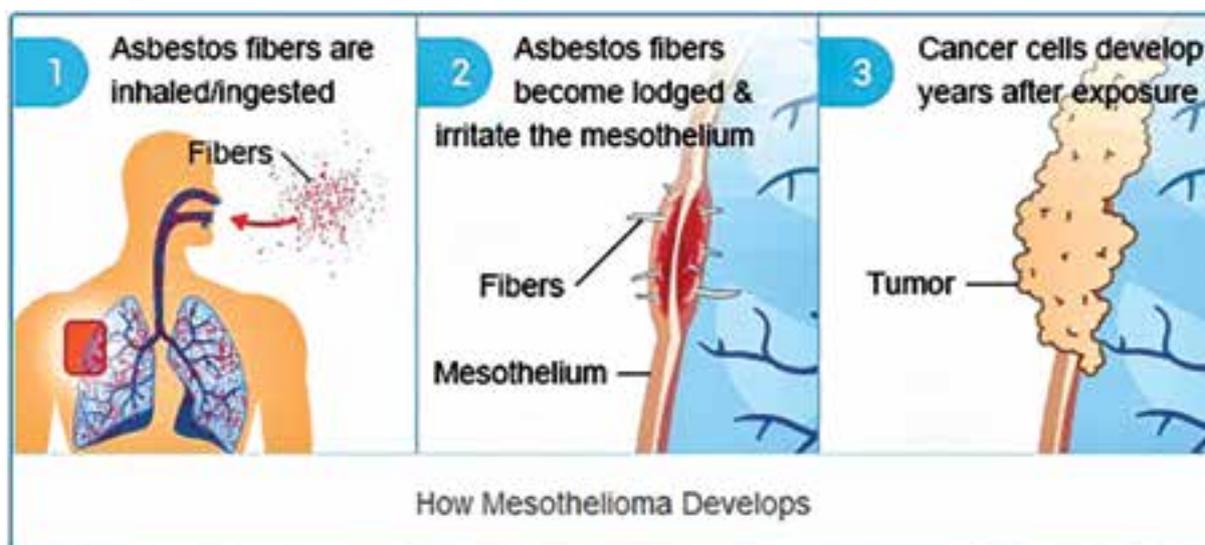


Figure 18. Development mechanism of Mesothelioma

All types of asbestos cause lung cancer, mesothelioma, cancer of the larynx and ovary, and asbestosis (fibrosis of the lungs). Exposure to asbestos occurs through inhalation of fibres in air in the working environment, ambient air in the vicinity of point sources such as factories handling asbestos, or indoor air in housing and buildings containing friable (crumbly) asbestos materials.

Currently about 125 million people in the world are exposed to asbestos at the workplace. In 2004, asbestos-related lung cancer, mesothelioma and asbestosis from occupational exposures resulted in 107,000 deaths and 1,523,000 Disability Adjusted Life Years (DALYs). In addition, several thousands of deaths can be attributed to other asbestos-related diseases, as well as to non-occupational exposures to asbestos (WHO).

Some studies have even suggested an association between asbestos exposure and gastrointestinal and colorectal cancers, as well as an elevated risk for cancers of throat, kidney, esophagus, and gallbladder (Lippincott Williams and Wilkins, 2004). Asbestos exposure could develop following symptoms (ATSDR 2009):

- Abdominal pain
- Ascites, or an abnormal buildup of fluid in the abdomen
- A mass in the abdomen
- Problems with bowel function
- Weight loss
- In more serious cases of the disease, the following signs and symptoms may also be present:
- Blood clots in the veins, which may cause thrombophlebitis
- Disseminated intravascular coagulation, a disorder causing severe bleeding in many body organs
- Jaundice, or yellowing of the eyes and skin
- Low blood sugar level
- Pleural effusion
- Pulmonary emboli, or blood clots in the arteries of the lungs



- Severe ascites
- Shortness of breath, wheezing, or hoarseness.
- A persistent cough that gets worse over time.
- Blood in sputum (fluid) coughed up from lungs.
- Pain or tightening in chest.
- Difficulty swallowing.
- Swelling of neck or face. Loss of appetite, Weight loss.
- Fatigue or anaemia.

23.1 Problem of Asbestos

Damage to asbestos-containing material can result in the release of small asbestos fibres that become airborne and are readily inhaled. These fibres can remain in the lungs for long periods and can cause serious lung disease.

23.2 What are the health concerns?

The principal health concerns are the development of asbestosis, lung cancer, pleural thickening and mesothelioma. These diseases have long latency periods, in the order of 10-50 years.

Asbestosis: This is a slowly developing and progressive scarring of the lungs caused by the inhalation of high concentrations of asbestos dust and/or long exposure. The elasticity of the lungs is reduced and also their ability to exchange gases. The result is decreased lung volume, increased resistance in the airways and reduced oxygenation of blood. It is associated with occupational rather than environmental exposure. Advanced asbestosis is often associated with lung cancer, especially among smokers.

Lung cancer: The risk is related to the nature of the occupational exposure and also to smoking; smokers have a higher risk of developing lung cancer than non-smokers when exposed to asbestos.

Diffuse pleural thickening: This is a non-malignant disease in which the lining of the lung (pleura) becomes scarred. Small areas of scarring are called pleural plaques. The disease is a chronic condition with no cure.

Mesothelioma: This is a malignant tumour of the pleura or peritoneum. It is linked with exposure to all types of asbestos. As well as being an occupational hazard, it may develop in non-occupationally exposed people living in the same household as asbestos workers or in the vicinity of strong asbestos emission sources.

23.3 What is a safe level of exposure?

Asbestos is a proven human carcinogen (IARC Group 1). No safe level can be proposed for asbestos because a threshold is not known to exist. The greater the exposure, the greater the risk of developing lung disease, therefore exposure should be kept as low as possible. A number of occupational exposure limits have been set:

The USA Occupational Safety and Health Administration (OSHA) standard for asbestos in the workplace is 0.1 fibres/ml of air as an 8-hour Time Weighted Average.

The UK Health and Safety Executive have set the following exposure limits:

For the amphibole asbestos minerals (amosite, crocidolite, fibrous actinolite, fibrous tremolite and fibrous anthophyllite, or any mixture of these with chrysotile):

- Short-term exposure limit: 0.6 fibres/mL averaged over any continuous 10 min
- Long-term exposure limit: 0.2 fibres/mL averaged over any 4 h

For chrysotile: Short-term exposure limit: 0.9 fibres/mL averaged over any continuous 10 min Long-term exposure limit: 0.3 fibres/mL averaged over any 4 h

23.4 What are the risks in the post-tsunami (or post-earthquake) clear-up?

During the clear-up damaged and destroyed buildings after the tsunami and/or earthquake, it is likely that there will be a need to handle and break up and dispose of asbestos-containing building and insulation materials. Much of this work may be undertaken by volunteers and local residents who are unaware of the hazards of asbestos and who may be unable to identify asbestos-containing material.

23.5 How can risks be minimized?

The main principles of safe handling are to:

- identify the locations of asbestos-containing materials and carry out a risk assessment
- ensure that people involved in clear-up work are adequately informed of the risks and the methods of best practice;
- minimize the disturbance of asbestos containing materials;
- minimize the release of respirable asbestos in the atmosphere by wetting;
- minimize the extent to which people have contact with asbestos; and
- ensure that waste is securely stored and adequately labelled.

23.6 Disposal of asbestos-containing materials

These materials should be disposed of by properly trained personnel.

Transport asbestos waste in bulk. During transportation ensure that containers remain covered or sealed so that dust and fibres do not escape.

Asbestos-contained materials can be disposed of in landfill sites provided these have appropriate measures to prevent release of asbestos fibre, e.g. a liner and a system for leachate collection. Ensure that a record is kept of the location of this waste, including exact geographical coordinates.

- Do not mix with other waste prior to disposal
- Do not dispose of in a location where there is already asbestos containing material
- Do not dispose of in a location where there may be future construction of landfill components, such as leachate head-wells or gas extraction wells.
- DO NOT dispose of by burning.⁵²

52 <http://www.searo.who.int/entity/emergencies/documents/asbestos.pdf?ua=1>

23.7 Substitutes

Numerous materials substitute for asbestos. Substitutes include calcium silicate, carbon fiber, cellulose fiber, ceramic fiber, glass fiber, steel fiber, wollastonite, and several organic fibers, such as aramid, polyethylene, polypropylene, and polytetrafluoroethylene. Several nonfibrous minerals or rocks, such as perlite, serpentine, silica, and talc, are considered to be possible asbestos substitutes for products in which the reinforcement properties of fibers were not required. For the chlor alkali industry, membrane cell technology is one alternative to asbestos diaphragms⁵³.

Substitutes for these asbestos products are not limited to products that simply replace asbestos with another material (e.g., PVA and cellulose in fiber-cement roofing sheet). There are also a number of wholly different products that can replace the asbestos products. A number of substitutes for asbestos-cement products are included in the following table⁵⁴.

Table 17. Substitutes for Asbestos and asbestos containing products

Asbestos Product	Substitute Products
Asbestos-Cement Corrugated Roofing	Fiber-cement roofing using: synthetic fibers (polyvinyl alcohol, polypropylene) and vegetable/cellulose fibers (softwood kraft pulp, bamboo, sisal, coir, rattan shavings and tobacco stalks, etc.); with optional silica fume, flyash, or rice husk ash Microconcrete (Parry) tiles Galvanized metal sheets Clay tiles Vegetable fibers in asphalt Slate Coated metal tiles (Harveytile) Aluminum roof tiles (Dekra Tile) Extruded uPVC roofing sheets Recycled polypropylene and high-density polyethylene and crushed stone (Worldroof) Plastic coated aluminum Plastic coated galvanized steel.
Asbestos-Cement Flat Sheet (ceilings, facades, partitions)	Fiber-cement using vegetable/cellulose fibers (see above), wastepaper, optionally synthetic fibers Gypsum ceiling boards (BHP Gypsum) Polystyrene ceilings, cornices, and partitions Façade applications in polystyrene structural walls (coated with plaster) Aluminum cladding (Alucabond) Brick Galvanized frame with plaster-board or calcium silicate board facing Softwood frame with plasterboard or calcium silicate board facing.
Asbestos-Cement Pipe	High Pressure: Cast iron and ductile iron pipe High-density polyethylene pipe Polyvinyl chloride pipe Steel-reinforced concrete pipe (large sizes) Glass-reinforced polyester pipe Low Pressure: Cellulose-cement pipe Cellulose/PVA fiber-cement pipe Clay pipe Glass-reinforced polyester pipe Steel-reinforced concrete pipe (large diameter drainage)

53 <http://minerals.usgs.gov/minerals/pubs/mcs/2015/mcs2015.pdf>

54 http://ibasecretariat.org/bc_subst_asb_cem_constr_prods.php

Asbestos Product	Substitute Products
Asbestos-Cement Water Storage Tanks	Cellulose-cement Polyethylene Fiberglass Steel Galvanized iron PVA-cellulose fiber-cement
Asbestos-Cement Rainwater Gutters; Open Drains (Mining Industry)	Galvanized iron Aluminum Hand-molded cellulose-cement PVC

http://ibasecretariat.org/bc_subst_asb_cem_constr_prods.php

24. Environmental Impacts of Asbestos

24.1 Environmental Impacts

As such there is no dedicated dumping of the Asbestos waste so far seen in the country and the project site of Central to Eastern Terai. However, in 2013, there were piles of the asbestos waste were dumped in the heart of the capital city Kathmandu in a very popular and most travelled place/ junction called Maitighar Mandala (Fig below) and buried as well as remaining still supposed to cove under the road expansion corners towards Maitighar to Baneshwar. After writing the advocacy campaign letter (Annex 1) to the Ministry of Population and Environment- MOPE (the then Ministry of Science, Technology and Environment- MOSTE) and copy to Ministry of Health (MOH), Prime Minister Office as well as President Office through a formal advocay letter from Center for Public Health and Environmental Development (CEPHED) along with the picture of the Asbestos Waste on the letter itself on 25th November 2013. The letter have taken the argument of drinking water contamination, the dumping has been happening in the most popular cross sections of the roads daily traveled by many government and associated buisness communities and general public and asked for immediate collection and safety manage the waste. Department of Road and Ministry of Phyisical Planning and Works were also infored about the dumping and asked to take care of their waste and ensure completely removal of such toxic waste being burried under road. **So these are only known hotspot and environmental dumping of asbestos waste so far in Nepal.**

Department of Environment (DOE) were directed to act immediately from the MOPE and have removed all the asbestos from this location but dumped again in the Teku Waste Transfer Station (Fig below). We did not found any piece of such waste at the moment at Teku after a year, were just disposed along with the other city garbage to the landfill site. But MOPE acted further and initiated positive steps to ban the import, sale, distribute and uses of all form of asbestos exept lining of brake shoe and clutch plates on December 22, 2014 through a gazette notification (**Khand 64, Number 30, Part 5, Date December 22, 2014, Notice No. 4**). The decision has been took effects from 20th June 2015.



Figure 19. Asbestos Waste dumped at Maitighar Mandala, water recharging zone, the only underground reliable source of drinking water for capital people of Kathmandu (November 2013)



Figure 20.. Up on complain filled to MOPE, MOH and OPMCM, Department of Environment immediately took away some left over Asbestos waste from Maitighar Mandala to Teku Waste Transfer Station on 25th November 2013 and left unattended again.

In addition to this direct initiative from the MOPE and DOE, Department of Road, the responsible agencies for road expansion were also asked to address these issues.



Figure 21. Crumbled corrugated asbestos sheets in Ranigunj, Sharlahi, Nepal

25. Hotspots (School, College, Government Offices, Waste, etc.)

Asbestos has been found to be imported from long back into the country for various purposes under different trade and cooperation mechanism with several countries. However this material were not so popular till recent past (a decade ago). The old USAID funded project and/or other ODA supported project on Road Sector, Geology and Mines Sector, Agriculture sectors had been found uses of Asbestos as the roofing materials. Hardly, any private building had seen using the asbestos as roofing materials before 10 years. However, in the recent years the asbestos corrugated sheets were became so popular among the local people especially in Central and Eastern Terai and being massively used for the roofing materials in many schools, colleges, government offices and even massively in private houses. Visiting several villages (more than 10 villages) from Parsa district (Central Terai) to Morang district (Eastern Terai), all most all villages and almost entire private houses have been found using asbestos as roofing materials at least for their kitchen and cattle sheds among entire houses.



Figure 22. Uses of Asbestos roofing in Terai

As these materials are getting old, the dislodging of asbestos tiny fibres get into the surrounding air thus in human and animal bodies and definitely start causing several health implications including cancer. In addition, the massive users like schools, colleges, public offices etc. are going to be turned into the waste in upcoming 5 to 10 years and there will be huge mass of Asbestos containing waste required to be safely disposed and handled. So for this profile, the mass user such as school, colleges, government offices are considered as the hotspots of the Asbestos. The individual houses who have used the Asbestos are also under severe threats. All these need to be protected by having safe and environmentally sound collection, management and disposal.

The extent of uses of asbestos can be gauged by following facts. In a place called Mirchiya in Siraha district, an upcoming town and newly declared municipality in eastern Terai. At least 10 Private Boarding schools have the Asbestos roofing in their schools as well as hostels. Another longitudinal travel to 2 KM distance in Siraha bazar, almost all houses have the Asbestos roofing.

Among other uses, asbestos roofing has been rampantly used in central and eastern Terai in schools, colleges, hostels, hotel, restaurants, shops, individual houses, kitchen, animal sheds, toilets, government offices, security guard office and security personnel's quarters, custom offices, bus counters etc.



Figure 23. Houses with different uses (shops, hotel, residence, animal shed etc.) with asbestos roofing in Terai



Figure 24. Asbestos Roofing 1. Custom Office, 2 & 3 Schools ,
4. Custom Security Office, 5. Security Guard Quarters

26. Environment Tour and Sampling of Asbestos, Asbestos containing products

CEPHED's team mobilised in the ten districts of Nepal from Parsa, Bara, Rauthat, Sahrlahi, Mahotary, Dhanusha, Siraha, Saptari, Sunsari and Morang. During the field visit, we have meet several government officials, custom offices, villagers with asbestos roofing, dealers, retailers, hospitals etc. We have collected some nine samples comprising of 7 Asbestos sheets pieces, 1 brake shoe and 1 clutch plates in the first round of field visit during February and March 2016. While in second round during April 2016, we again made another field visit and meet some high level policy officials at central government offices such as Joint secretary at Ministry of Population and Environment (MOPE), Secretary at Office of the Prime Minister and Council of Ministers (OPMCM) and with some trade union called General Federation of Nepalese Trade Unions (**GEFONT**) as well as some workshop of brake lining and observe their working condition, took some sample of dust from their working stations, some asbestos pieces and also visited some other area with alternative roofing materials during such as U PVC and also took sample of it.



We had sent the sample for testing about the type and content of asbestos to Tokyo Occupational Safety and Health Center. The first batch of testing results has been received and presented in the following tables.



Figure 25. Samples for testing of Asbestos types and Content

26.1 Method of Sample Analysis: Polarized Light Microscopy (PLM)

The most direct and powerful application of polarized light microscopy (PLM) is the identification of hundreds, if not thousands, of particles types and materials based only on their morphological and optical properties. Many types of fibers, pigments, food products, pollen grains, spores, hairs, glass, combustion products, pharmaceuticals, explosives, minerals and other crystalline materials can be identified by sight alone or with the aid of a few simple optical tests that can be conducted in a matter of seconds with the polarizing microscope.

PLM is also a useful tool for the recognition and identification of samples that contain multiple components and that would be difficult or impossible to analyse by other instrumental techniques. By using the unparalleled pattern recognition capabilities of the human eyes and brain, PLM offers a degree of speed and specificity unmatched by any other analytical technique.

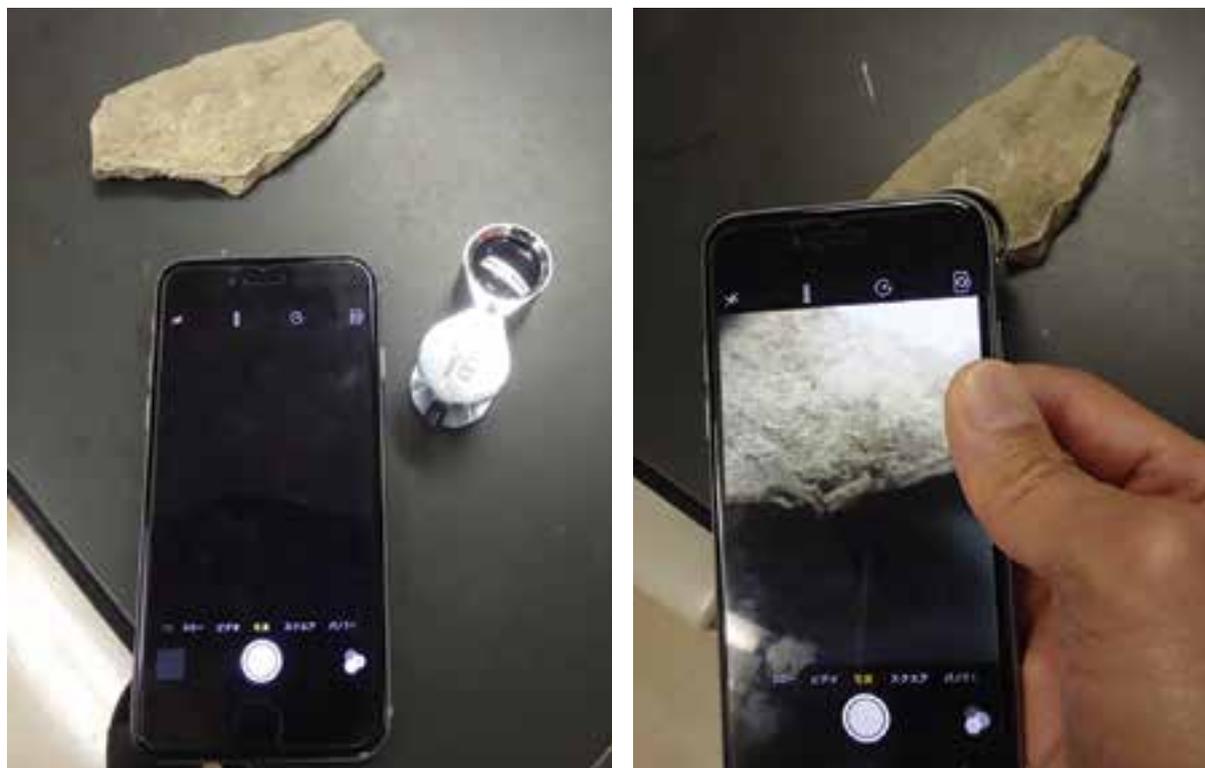


Figure 26. Sample testing for Asbestos Fiber type and content

Polarized light microscopy employs a compound microscope equipped with a rotating stage and Polaroid filters for illumination of a sample with polarized light. It is an extremely useful light microscopy technique, solving a high percentage of analytical problems. A partial list of the properties of individual particles as small as a few micrometers that can be determined with the polarized light microscope would include size, shape, colour, density, surface texture, refractive indices, pleochroism, transparency/opacity, crystal habit, crystal system and interfacial angles. Through the use of observed physical manipulation and chemical reaction, properties such as elasticity and solubility may also be determined.

When polarized light microscopy is combined with micro-scale techniques of qualitative analytical chemistry (chemical microscopy), it becomes an even more powerful and versatile tool for solving a wide variety of contamination, particle identification and materials analysis problems. McCrone Associates uses a number of Olympus brand polarized light microscopes⁵⁵.

26.2 Collection of Dust and roof material samples

Though the recent current Asbestos uses are rampant in the Terai Region of Nepal, the exempted items such as lining of brake shoe and clutch plates, a number of shops are there for fixing the brake lining. Visits have been made to one such brake shoe lining center and try to meet as well as took the

55 <https://www.mccrone.com/polarized-light-microscopy#sthash.fMWbAkQI.dpuf>

samples. Some five samples (two dust wipe, two dusts and 1 brake shoe pad) were taken from this shop to see the level of asbestos contamination in their working environment. In addition to this, a special UPVC plastic roofing panel has been newly introduced in Nepal and we also able to see and take sample of it as well.



Figure 27. Dust samples from Working Station

Table 18. Results of Asbestos and Testing for its type and content

Sample ID	Place and description	Sample Date	Results of Laboratory Analysis		
			Asbestos Type	Mass Fraction of Asbestos	Non Asbestos Fibers
NPL -1	Koshi Saptari	13 Feb 2016	Chrysotile	5 -50%	None
NPL-2	Mills Area Janakpur Dhanusha , Charminar, Birla, Fiber Cement Sheets OHSAS 18001 Certified	15 Feb 2016	Chrysotile	5 -50%	Organic Fibers
NPL-3	Ramanand Chowk, Janakpur, Ankur Fiber Cement Sheets ARL Ltd	16 Feb 2016	Chrysotile	5 -50%	None
NPL - 4	Laibadndi , Sharlahi, RAMCO Cement Fiber Sheet	18 Feb 2016	None	-	None
NPL-5	Chandra Nigahpur, hotel , Rauthat	19 Feb 2016	None	-	None
NPL-6	Mirchaiya, Siraha Paras Enterprises	20 Feb 2016	Chrysotile	5 -50%	Cellulose Fibers
NPL – 7	Siraha, Policy Chwki, Bansal Suppliers Everest Cement Fiber Sheets	21 Feb 2016	Chrysotile	5 -50%	Cellulose Fibers
NPL- 8	Clutch Plates Asbestos lining	24 March 2016	None	-	Unknown Fibers
NPL – 9	Brake Shoe Asbestos Lining	24 March 2014	Chrysotile	5 -50%	None
Second Batch Samples					
NPL 10	Dust Wipe from Working Station ground	25 April 2016	Chrysotile	1%	-
NPL 11	Dust from waste (ground)	25 April 2016	Chrysotile	1%	Organic Fiber
NPL 12	Dust from Working Station (table)	25 April 2016	Chrysotile	3%	Organic Fiber
NPL 13	Dust wipe from Table (showcase)	25 April 2016	Chrysotile	1%	-
NPL 14	Brake Shoe Piece	25 April 2016	Chrysotile	5-50%	None
NPL 15	UPVC Plastic roofing material	26th April 2016			

CEPHED Result on Asbestos 2016, test carried out by Tokyo Occupational Safety and Health Center, Tokyo , japan

Spraying was totally prohibited in Japan: The cut-off value for asbestos in all materials was set at 0.1% by weight. The OEL was set at 0.15 fibers/mL.

No. NPL-3

1. Stereomicroscope observation

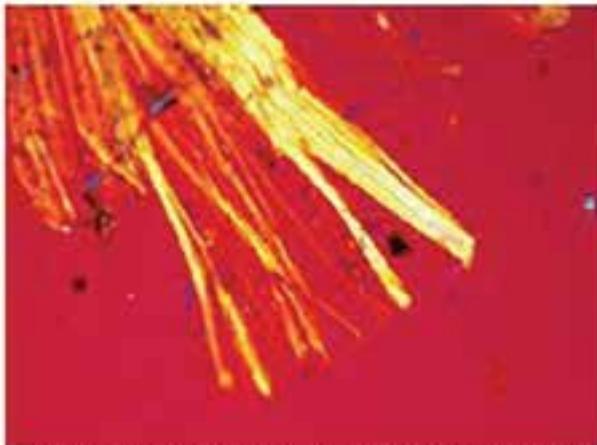


×10



×40

2. Polarized light microscope observation



Crossed polars with 530nm retardation plate ×100



Crossed polars ×400



Dispersion staining ×100



Raw Sample

Figure 28. Images of Asbestos fibers testing through using polarized light microscopy (PLM)

27. Asbestos Management Plan of Action

27.1 Common Challenges after imposing ban of asbestos need to be tackled.

- Achieving a total ban and ensuring its implementation Making our society/environment free from asbestos (tackling the existing asbestos and contaminated areas)
 - o Identification, management, removal and disposal
 - o National strategic plan and the involvements of all concerned
- Eliminating asbestos-related diseases and achieving the justice for all affected
 - o Early detection, diagnosis, treatment and rehabilitation
 - o Register of exposed people and health monitoring
 - o Compensation and psychosocial supports
 - o Empowerment of victims and their families
- Facilitating international collaboration for achieving the above globally
 - o Regional and international efforts
 - o Signing, adopting and ratifying international instruments e.g. SAICM, Rotterdam Conventions and ILO Conventions etc.

27.2 Ensuring Ban Implementation

- Total ban will be achieved through a phase-out plan – planned removal of the exemptions from a ban as in case of Nepal for exemption of asbestos lining for break shoe and clutch plates.
- Ban implementation still remains a big challenge and needs to be tackled as followings.
 - o Illegal import and use (both of intentionally and not-intentionally)
 - o Reuse of secondhand asbestos containing materials/wastes
 - o Naturally occurring asbestos (such as talc contaminated with asbestos)
- Public awareness as well as awareness at all stakeholder level will be most important
- Regular monitoring and inspection scheme
- Special concern on recovery and reconstruction process after disasters

27.3. Tackling the Existing Asbestos

- Identification
 - o Register/mapping of the existing asbestos
 - o When, Who and How to identify Asbestos Containing Materials?
 - o Consideration on flyable/non-flyable, bad/good condition, potential exposed population, availability of safe removal/disposal etc.
 - o removal or management until removed
- Management
 - o Management plan with expected timing of removal and its implementation
 - o Leveling and making plan available for all concerned, encapsulation, off-limits, etc.
- Exposure Reduction and Management
 - o The current and perspective exposure from the current uses of asbestos need to be immediately addressed (e.g. through painting, covering the exposed part, not disturbing asbestos etc.)
- Removal
 - o Training and licensing of contractors as removal is dangerous to release asbestos fiber

- Disposal
 - o Approved asbestos waste disposal sites
 - o Regulations on disposal of hazardous wastes
 - o This can be a model for life-cycle management of chemicals through environmentally sound manners.

27.4 Asbestos Free Environment/Society

Strategic approach development and adoption

- Endorsement and adoption NAP (National Asbestos Profile) developed by other section (e.g. In case of Nepal , CEPHED has developed with close coordination with all possible stakeholders including government agencies).
- NPEAD (National Program for Elimination of ARDs) will be still needed even if a total ban has been introduced.
- Goal setting with a road map for safe removal/disposal of all existing asbestos
- Step-by-step, prioritized and holistic planning
- Implementation structure with necessary resources
- Clarification of the roles of all concerned
- Decontamination of contaminated areas if needed
 - o Areas affected by former asbestos mine/plant
 - o Areas where asbestos materials/wastes were disposed (generally dump sites of asbestos wastes should never been redeveloped)
 - o Environmentally sound management of existing waste and contaminated sites.

28. Conclusion and Recommendation

28.1 Conclusion

Nepal is the first country in South Asia to ban import, sale, distribute and uses of all form of asbestos except lining of break shoe and clutch plates. Nepal being a small and beautiful country did not mine any asbestos and related products however import and use large quantities of asbestos and related products from different countries mostly from India and China and also having provision to receiving asbestos based products in several bilateral trade agreements with different countries. Though there is no specific regulation to deal with Asbestos exclusively earlier, government had banned its import, sale, distribution and uses effective since 20th June 2015, country had additional good national legislative framework in which asbestos and its related issues and problems can be regulated. Additionally, Nepal is already party to several chemicals and waste related MEAs and International Conventions namely POPs Convention, Basel Convention and Rotterdam Convention on PIC and has been also adopted the SAICM plan of actions.

With respect to national capacity to dealt with cancer and any other asbestos related diseases and health problems, there is good infrastructure including some dedicated specialised cancer hospital itself in the country since more than a decade. Additionally, there is growing concerned on health and environment and particularly chemicals safety issue and hence some of the policy and project level initiatives to address the health and safety of the children, worker and general public are already ongoing.

Some local initiatives and campaigning toward banning of all forms of asbestos has been already successful in shaping the legal ban of asbestos in place, and now research, follow up and awareness raising is on-going toward effective implementation of the government banning decisions. With all these initial initiatives and growing global concerned, it is high time for the Government of Nepal to take initiative towards ensuring the effective implementation of its banning decisions of all form of asbestos from import to use and envision the required robust specific legislative as well as institutional framework at earliest possible to protect public health and environment at large from the ill effect of asbestos.

There is an utmost need to ensuring of not using and promoting any asbestos containing and other hazardous construction material in post disasters reconstruction of Nepal as well as ensuring the safe and environmentally sound management of hazardous waste containing asbestos and other toxic waste. Finally, the exposure from already used asbestos as the roofing materials in most of the Terai region of Nepal and in entire country need to be reduced and a national action plan need to be prepared , effectively implemented towards complete elimination of all form of asbestos from Nepal.

28.2 Recommendations

Based on the review of existing country situation on various aspect and issues associated with the asbestos , its import, sale, distribute, uses, exposure , health impacts, asbestos related diseases , national level, institutional and health facilities and directly observing and meeting to the people, organisations and health care professionals, following recommendations has been made.

Ministry of Population and Environment (MOPE) and Department of Environment (DOE)

- Government of Nepal, MOPE to go for total asbestos ban and take all possible initiatives for effective implementation of its banning decisions of all form of asbestos from import, sale, distribute and uses.
- Ensuring the safe and environmentally sound management of hazardous waste containing asbestos and other toxic waste.
- National Actions Plans need to be prepared and effectively implemented towards complete elimination of all form of asbestos from Nepal.

Ministry of Health (MOH) and Nepal Health Research Council (NHRC)

- Stop the use of all types of asbestos and stimulate substitution/replacement of asbestos and asbestos containing materials,
- Enact robust and specific legislative & institutional framework to protect public health and environment.
- There is an urgent need to prevent of exposure from already used asbestos as the roofing materials in country and mostly in Terai.
- Improve early diagnosis, treatment, social and medical rehabilitation of ARDs
- Establish registries of people with past and/or current exposure to asbestos (and conduct health surveillance for/monitoring them).
- Demographic and Epidemiological study for asbestos related exposure potential and diseases, number of workers, listing of asbestos based and/or using industries with potential workers exposures, level of exposure, estimation of burden of diseases related to asbestos, disability adjusted life (DALYs) and deaths attributable to asbestos exposure etc.

Ministry of Labour and Employment (MOLE), Department of Labour and OSH Project

- Ministry of Labour and Employment should either establish a separate OSH Department and/or strengthened OSH Section under the existing Department of Labour.
- There should be specific OSH policy, Act and Standard for asbestos exposure limits with full mechanism of realizing eligible compensation for asbestos related diseases and estimate economic losses.
- Government of Nepal should enact the national foreseeable occupational exposure limits of asbestos along with the system of inspections and enforcement of the exposure limits.
- MOLE should urgently act up on towards ratification of ILO Convention on The **Occupational Cancer Convention, 1974 (C.139)**, **The Asbestos Convention, 1986 (C.162)**, **The Chemicals Convention, 1990 (C.170)**, Promotional Framework for Occupational Safety and Health Convention, 2006 (No. 187), Occupational Health Services Convention, 1985 (No. 161) and Safety and Health in Mines Convention, 1995 (No. 176) and localize its provisions.

Ministry of Finance (MOF), Department of Custom and Custom Offices

- Ministry of Finance, Department of Custom and all Custom offices in Nepal should strictly follow the Gazette Notifications of Asbestos ban and effectively implement the government decision so as to make ZERO asbestos import as per the gazette.
- Ministry of Finance and its department should develop required numbers of fully functional testing laboratories to test any suspected materials (import and domestics) for asbestos content and type as well as other chemical testing,
- All form of legal and illegal importation of banned Asbestos and Asbestos containing products needs to be strictly stopped.

Ministry of Commerce, Ministry of Supply and Ministry of Home Affairs, Department of Commerce and Supply Management

- Ministry of Commerce, Ministry of Supply, ministry of Home Affairs and Department of Commerce and Supply Management (DoCSM) needs to strengthened and increased their market monitoring and seize all the asbestos containing products available in the market for sale, distribute and uses contravention to the Gazette Notification.

Ministry of Urban Development and Department of Urban Development and Construction

- The identified hot spots of the Asbestos uses (House, Schools, Government Offices, Security Personnel's Offices and Quarters etc.) need to be tackling first and should replace with safer roofing material and handle the waste generated scientifically and environmentally sound manner.
- It also needs to stress stopping broken material being used by affected populations and also new asbestos material being procured by aid agencies and affected communities for any construction and especially for the Post Disaster Reconstruction of Nepal.
- There is an urgent need to amend all the building codes and material codes in the change context of already banned asbestos and asbestos containing materials.
- The toxic construction materials such as asbestos, asbestos containing products, practices as well as other toxic construction materials like leaded paints etc. should be avoided through proper inclusion of these issues in GREEN BUILDING Guideline.

National Cancer Registry and Cancer Hospitals of Nepal

- Cancer Hospitals need to initiate separate record keeping and study of prevalence of asbestosis (total number of peoples/workers with diagnosed asbestosis, asbestos-related lung cancer and mesothelioma to-date) among asbestos exposed workers/citizens.

National Reconstruction Authority (NRA)

- Ensuring of not using and promotion of any asbestos containing and other hazardous construction material in Nepal including post disasters reconstruction.

Private Sector / Asbestos Entrepreneurs (Importer, Dealers, Retailers)

- All importer, dealers and retailers need to cooperate and collaborate with the government towards effective implementation and compliance of the Gazette notification of banning the import, sale, distribute and uses of the asbestos and asbestos containing products contravention to the Gazettes.
- Asbestos entrepreneurs should stop miss advertising about the asbestos as good construction material rather they should inform the public about its carcinogenicity.
- They should promote sale, distribute and promote and alternative safer materials .

General Recommendations

- The ongoing cases in the Supreme Court of Nepal filed by Business Community against the government decision of banning this toxic asbestos should be settled at earliest possible in the favor of public health, workers health, children health and environment.
- Coordination among and between concerned government agencies and their departments and other stakeholders should be established and supported through functional mechanism toward identification, collection, monitoring and evaluation of asbestos, related health and environmental implications.
- Awareness among all stakeholders, importers, distributors and users as well as general public about asbestos, its health and environmental implications need to be raised. NGOs can play important role on this along with the filed level research and monitoring.
- Development agencies like WHO, ILO need to strengthen the national research, training and institutional capacity to address the Asbestos Related Diseases from the possible and potential exposure. Also support awareness raising and capacity buildings of the stakeholders.
- Trade Unions should be proactively engaged toward protection of workers from increased sources of asbestos exposure and help in effective implementation of the government banning decision.
- General public should stop purchasing and using any types of asbestos and asbestos containing products and handle with case the already exist asbestos in their home to be safe.
- Media sectors can play vital role in disseminating information, fact and figure as well as health and environmental implications about asbestos thus to aware the public.

Annex 1. CEPHED's Campaign Letter for Asbestos Ban and Proper Waste Management



३-१-७५/७७०-७९

धीमान् सचिवज्यू,
विज्ञान, प्रविधि तथा वातावरण मन्त्रालय,
सिंहदरवार, काठमाण्डौ ।



जनस्वास्थ्य तथा वातावरण प्रवर्द्धन केन्द्र

Center for Public Health and Environmental Development

Bridging people with science and technology for healthy living and environmental development

Govt. Reg. 189/061/62
SWC Reg. 17256

मिति: २०७०.०६.१०

विषय: मानव जर्जितलाई क्यान्सर लगाउन सक्ने एसबेस्टस अव्यवस्थित तरिकाले काठमाण्डौको सडक पेटिमा पुग्दै गरेकोबाट पर्न सक्ने वातावरणीय र जनस्वास्थ्य सम्बन्धि ध्यानाकर्षण ।

धोरोप,

जनस्वास्थ्य तथा वातावरण प्रवर्द्धन केन्द्र (Center for Public Health and Environment Development) ले विगत ९ वर्ष देखि विभिन्न वातावरण संरक्षण तथा जनस्वास्थ्य सम्बन्धी अध्ययन अनुसन्धान, जानकारीमूलक प्रकाशन लगायत अध्ययनका परिणामहरु आम जलता एवं सम्बन्धित सबै सरकारीवाला जिम्मेवार निकायहरु समक्ष पुऱ्याउनुको साथै नन् सम्बन्धि जनचेतना तथा क्षमता अभिवृद्धि आदि कार्यहरु गर्दै आएको छ ।

उपरोक्त सम्बन्धमा विश्व स्वास्थ्य संगठन (World Health Organisation) र International Agency for Research on Cancer (IARC) ले सन्ध्याले एसबेस्टस मानवजातीलाई क्यान्सर लगाउन सक्ने प्रमाणित गरी सकेको र हाल आएर विम्वका करीब ४० देशमा एसबेस्टसको आयात, निर्यात र प्रयोगमा समेत बन्दैज बन्दैको अवस्थामा नेपालमा हालैका वर्षहरुमा समेत भन्सार विभागको तथ्यांक अनुसार आ.ब. २०६९/७० मा ११९४ टनसम्म क्यान्सरजन्य एसबेस्टस निर्यात रूपमा आयात एवं प्रयोगबाट मानवजातीमा क्यान्सरको बढ्दो आकडा थप हुदै गएको हुन सक्ने देखिन्छ । नेपालमा क्यान्सर रोगी सम्बन्धि कुनै आधिकारीक सरकारी तथ्यांक नभए पनि करीब ३२,००० देखी ४०,००० क्यान्सरका विरामीहरु पाईने अनुमान सरीएको छ । नेपाली जनताको मूख्य १० मृत्युको कारणहरुमध्ये ARI/Lower respiratory tract infection र Upper respiratory tract infection चौथो र पाँचौं दुवो कारणहरु एसबेस्टस संग पनि सम्बन्धित हुन सक्ने प्रचुर सम्भावना रहेको तर्फ यहाँ सबैको ध्यानाकर्षण गर्न चाहन्छु ।

साथै हालैका दिनमा देशको अन्य भाग लगायत राजधानी काठमाण्डौको केन्द्र माईतीघर चौकमा सडक विस्तार सगै यसता मानव जर्जितलाई क्यान्सर लगाउन सक्ने एसबेस्टस सडक पेटिमा अव्यवस्थित रूपमा पुग्दै गरेकोबाट बापु प्रदूषण संगै काठमाण्डौको खानेपानीको भूमिगत धोत समेत प्रदूषित भै सबसत मानवजाती तथा वातावरणमा प्रतीकूल असर पर्ने भएकोतर्फ सबै सम्बन्धित निकायहरुको ध्यानाकर्षण गराउदै नेपालमा सबै खासै एसबेस्टस, मिट्ट, शिमेन्ट, काईसर र अन्य एसबेस्टसजन्य उत्पादनहरुको पूर्णतया बन्दैज लगाउन यथाभिन्न आवश्यक पहलको लागि पनि हार्दिक अनुरोध गर्दछु ।

एसबेस्टस अव्यवस्थित रूपमा पुग्दै गरेको ठाउँ काठमाण्डौको केन्द्र मानिने माईतीघर चौक, नेपाल सरकार, स्वास्थ्य तथा जनसंख्या मन्त्रालयको १२० मिटर, वातावरण मन्त्रालयको १०० मिटर र प्रज्ञासन्धी तथा मन्त्रिपरिषदको कार्यालयको करीब १००० मिटरको दुरीमा रहेको जुरा पनि आयात गर्न चाहन्छु ।

उक्त एसबेस्टस पुग्दै गरेको ठाउँ स्वास्थ्य, वातावरण, फोहर व्यवस्थापन, भौतिक निर्माण लगायत एसबेस्टसको आयात, विक्रीवितरण तथा प्रयोग नियन्त्रण तथा बन्दैज गर्न हरेक सरकारी तथा निजी निकायका प्राय सबै कर्मचारीहरु तथा आमजनता करीब दैनिक रूपमा आवतजावत गर्ने ठाउँमा बैरङ्कोमा लुकेत वसको वातावरणमैसी उच्चत व्यवस्थापन गर्न गराउन पनि आग्रह गर्दछु । सहयोगको लागि धन्यवाद ।

अर्थात्,

राम खरिज साह
असपकारी निर्देशक

कार्यालय तथा धोरोप

(क) सम्माननीय राष्ट्रपतिज्यू, शिवालय, काठमाण्डौ ।

(ख) सम्माननीय अध्यक्षज्यू, मन्त्रिपरिषद, प्रज्ञासन्धी तथा मन्त्रिपरिषदको कार्यालय, सिंहदरवार, काठमाण्डौ ।



Annex 2: Kathmandu Valley Road Extension Project letter for proper handling of Asbestos Containing wastes exist in their office.

Letter from Government of Nepal, Ministry of Physical Planning and Transport, Department of Road, Kathmandu Valley Road Expansion Project to Department of Road, Planning and Design Division, Geo-Environment and Social Division, Babarmahal, Kathmandu assuring about the removal of asbestos being burying in Maitighar Mandala Chowk, kept in a sack and asking for the asking for necessary coordination and help to manage these asbestos containing waste. While developing this National Asbestos Profile, CEPHED team try to see those waste said to be safely kept with road project under Department of Road, talked to the concerned officials about these waste to take sample but none of the officials have any know how about the existence and their status and we did not able to take sample out of it. These might to still will Department of Road as toxic hazardous waste, need to be managed safely. Even complain has been launched through **DOR-Grievance Redress System** multiple times, but did not received any response so far.

नेपाल सरकार
भौतिक पूर्वाधार तथा यातायात मन्त्रालय
सडक विभाग
काठमाडौं उपत्यका सडक विस्तार आयोजना

फोन नं. :
०१-४४४३९,
०१-४४३०६
संकेत नं. : काठमाडौं
१४०८२०१६

संख्या: ०७०/७१
तारीख: २०७०/१२/१६

श्री सडक विभाग,
योजना तथा डिजाईन महाशाखा,
भू-वातावरण तथा सामाजिक शाखा,
बबरमहल, काठमाडौं ।

विषय :- एसबेस्टसको उचित व्यवस्थापन सम्बन्धमा ।

उपरोक्त सम्बन्धमा तहाँको च.नं. १२४/०७०/७१, मिति २०७०/८/१७ को पत्रानुसार जानकारी गराईएको उल्लिखित विषय अन्तर्गत माइतीघर-बानेश्वर सडकको माइतीघर मण्डला नजिक बायाँ साइडको फुटपाथमा रहेको एसबेस्टस (Asbestos) फुटपाथबाट निकाली सुरक्षित तवरले चोरामा प्याक गरी राखिएको (फोटोहरु संलग्न गरीएको छ) र उक्त एसबेस्टस को उचित व्यवस्थापन सम्बन्धमा यस आयोजनामा रक्षता नभएकोले आवश्यक सहयोग/समन्वयको लागि पहल गरिदिनु हुन अनुरोध गर्दछु ।

बोधार्थ :-
श्रीमान् महानिर्देशकज्यू, सडक विभाग, बबरमहल ।
श्री सडक विभाग, योजना तथा डिजाईन महाशाखा, बबरमहल ।
श्री जनस्वास्थ्य तथा वातावरण प्रबर्द्धन केन्द्र, नयाँ बस्ती, इमाडोल, ललितपुर ।

(रयाम प्रसाद खरेल)
आयोजना प्रमुख
आयोजना प्रमुख

Annex 3: Asbestos Related Disease (ARD) and disability adjusted life years (DALY's) based on

Estimated number of deaths

<http://vizhub.healthdata.org/gbd-compare/>

Deaths	Year	1990	1995	2000	2005	2010	2013
Occupational cancer (occupational exposure to asbestos)	A+B+C+D	1,772,821.97	1,950,909.00	2,091,103.06	2,244,185.04	2,992,476.27	3,402,225.49
Mesothelioma (occupational exposure to asbestos)	A	238,381.49	256,103.59	272,829.19	298,057.71	437,877.21	513,751.74
Lung cancer (occupational exposure to asbestos)	B Tracheal, bronchus and lung cancer	1,503,152.78	1,662,716.65	1,788,186.64	1,915,789.60	2,514,888.14	2,844,834.13
Ovarin cancer (occupational exposure to asbestos)	C	18,544.29	19,254.88	17,981.19	18,361.18	23,402.44	24,404.76
Larynx cancer (occupational exposure to asbestos)	D	12,743.42	12,833.87	12,106.04	11,976.55	16,308.48	19,234.86
Mesothelioma	A+E	417,088.07	445,135.15	466,913.14	504,037.94	673,977.91	763,535.24
Mesothelioma (non-occupational exposure to asbestos)	E	178,706.58	189,031.56	194,083.95	205,980.23	236,100.70	249,783.50
% of occupational mesothelioma	A/(A+E)	57.15%	57.53%	58.43%	59.13%	64.97%	67.29%
ARLC (occup)/Meso (occup)	B/A	6.31	6.49	6.55	6.43	5.74	5.54
Asbestosis	F	540,826.22	514,497.85	476,251.03	467,411.19	523,000.99	554,262.05
Total (deaths due to asbestos exposure)	B+C+D+(A+E)+F	2,492,354.78	2,654,438.40	2,761,438.04	2,917,576.46	3,751,577.96	4,206,271.04
Deaths	Year	1990	1995	2000	2005	2010	2013
Occupational cancer (occupational exposure to asbestos)	A+B+C+D	216.22	221.19	231.21	262.27	288.49	305.24
Mesothelioma (occupational exposure to asbestos)	A	51.11	50.15	50.57	54.50	58.67	61.47
Lung cancer (occupational exposure to asbestos)	B Tracheal, bronchus and lung cancer	137.14	143.53	152.67	175.72	194.48	206.73
Ovarin cancer (occupational exposure to asbestos)	C	17.61	17.36	17.84	20.88	23.22	24.34
Larynx cancer (occupational exposure to asbestos)	D	10.36	10.15	10.13	11.16	12.13	12.69
Mesothelioma	A+E	323.23	342.07	358.28	381.22	412.77	436.82
Mesothelioma (non-occupational exposure to asbestos)	E	272.12	291.93	307.71	326.72	354.10	375.34
% of occupational mesothelioma	A/(A+E)	15.81%	14.66%	14.11%	14.30%	14.21%	14.07%
ARLC (occup)/Meso (occup)	B/A	2.68	2.86	3.02	3.22	3.31	3.36
Asbestosis	F	3,819.06	3,796.06	3,367.10	3,413.65	3,553.89	3,670.42
Total (deaths due to asbestos exposure)	B+C+D+(A+E)+F	4,307.40	4,309.18	3,906.02	4,002.63	4,196.48	4,351.00

estimated of global burden of diseases of WHO.

Estimated number of deaths
<http://vizhub.healthdata.org/gbd-compare/>

Deaths	Year	1990	1995	2000	2005	2010	2013
Fig-5: Occupational exposure to asbestos (=deaths due to occupational asbestos cancer)		93,847.71	106,538.33	118,168.73	130,615.18	172,398.83	194,251.90
	Fig-6: Mesothelioma	11,391.72	12,649.23	13,697.72	15,284.10	21,715.12	25,211.81
	Fig-7: Tracheal, bronchus and lung cancer	80,913.43	92,254.14	102,911.49	113,731.26	148,621.17	166,773.53
	Fig-8: Ovarin cancer	907.57	982.54	926.06	960.88	1,211.37	1,273.34
	Fig-9: Larynx cancer	634.99	652.42	633.46	638.94	851.18	993.23
	Total	93,847.71	106,538.33	118,168.73	130,615.18	172,398.83	194,251.90
	*** Methods for the above estimation have not been explained yet						
Fig10: Mesothelioma deaths		16,971.84	18,648.21	19,987.14	22,128.91	29,690.19	33,743.73
	% of occupational mesothelioma = Fig-6 / Fig-10	67.12%	67.83%	68.53%	69.07%	73.14%	74.72%
	*** We can consider all mesothelioma deaths will be due to asbestos exposure						
	Non occupational mesothelioma = Fig-10 - fig-6	5580.12	5998.97	6289.42	6844.81	7975.07	8531.92
	Meso/ARLC = Fig-6 / Fig-7	7.10	7.29	7.51	7.44	6.84	6.61
	*** The reason why the above rate was calculated has not been explained yet.						
Fig11: Asbestosis deaths		21,020.30	20,557.61	19,509.61	19,730.25	22,536.08	24,086.55
	*** We can consider all mesothelioma deaths will be due to asbestos exposure						
Deaths due to asbestos exposure							
Fig-5: Occupational exposure to asbestos as a carcinogen (occupational asbestos cancer)		93,847.71	106,538.33	118,168.73	130,615.18	172,398.83	194,251.90
	Non occupational mesothelioma = Fig-10 - fig-6	5,580.12	5,998.97	6,289.42	6,844.81	7,975.07	8,531.92
Fig11: Asbestosis		21,020.30	20,557.61	19,509.61	19,730.25	22,536.08	24,086.55
	Total	120,448.13	133,094.92	143,967.76	157,190.23	202,909.98	226,870.37

Deaths	Year	1990	1995	2000	2005	2010	2013
Fig-5: Occupational exposure to asbestos (=deaths due to occupational asbestos cancer)		8.91	9.25	9.90	11.52	12.86	13.72
Fig-6: Mesothelioma		1.99	1.97	2.01	2.21	2.39	2.52
Fig-7: Tracheal, bronchus and lung cancer		5.75	6.11	6.65	7.86	8.82	9.45
Fig-8: Ovarin cancer		0.75	0.75	0.80	0.97	1.11	1.19
Fig-9: Larynx cancer		0.42	0.42	0.43	0.49	0.53	0.56
Total		8.91	9.25	9.90	11.52	12.86	13.72
*** Methods for the above estimation have not been explained yet							
Fig10: Mesothelioma deaths		9.34	9.89	10.51	11.58	12.65	13.42
% of occupational mesothelioma = Fig-6 / Fig-10		21.30%	19.90%	19.17%	19.11%	18.91%	18.76%
*** We can consider all mesothelioma deaths will be due to asbestos exposure							
Non occupational mesothelioma = Fig-10 - fig-6		7.35	7.92	8.49	9.37	10.25	10.91
Meso/ARLC = Fig-6 / Fig-7		2.89	3.11	3.30	3.55	3.69	3.75
*** The reason why the above rate was calculated has not been explained yet.							
Fig11: Asbestosis deaths		134.96	137.65	127.09	133.46	141.53	148.11
*** We can consider all mesothelioma deaths will be due to asbestos exposure							
Deaths due to asbestos exposure							
Fig-5: Occupational exposure to asbestos as a carcinogen (occupational asbestos cancer)		8.91	9.25	9.90	11.52	12.86	13.72
Non occupational mesothelioma = Fig-10 - fig-6		7.35	7.92	8.49	9.37	10.25	10.91
Fig11: Asbestosis		134.96	137.65	127.09	133.46	141.53	148.11
Total		151.22	154.82	145.48	154.35	164.65	172.74

(Footnotes)

1 <http://www.dotm.gov.np/uploads/files/Vehicle-data-type-wise-till-2072-baishakh.pdf>2 <http://www.irinnews.org/report/95121/asia-asbestos-deadly-but-not-yet-banned>

Handle asbestos carefully: NGO

Himalayan News Service
Kathmandu, November 26

A non-government organisation has drawn the attention of the government towards the mismanagement of asbestos in the Kathmandu Valley.

The Centre for Public Health and Environmental Development, in a letter to the Ministry of Science, Technology and Environment, pointed at haphazard handling of the cancer-causing substance during the ongoing road construction work. According to the World Health Organisation, asbestos is one of the most important occupational carcinogens that causes about half of the deaths from occupational cancer, including lung cancer. Exposure to asbestos occurs through in-

halation of fibres primarily from contaminated air in the environment, as well as from ambient air in the vicinity of point sources, or indoor air in housing and buildings containing friable asbestos materials.

The WHO and the International Agency for Research on Cancer have identified asbestos as a cancer-causing factor, prompting around 40 countries in the world to ban its export and import, it said.

"Records at the Department of Customs show that Nepal imported about 1,195 tonnes of asbestos for use in construction work in the fiscal year 2012-13. According to estimates, around 40,000 people are living with cancer in Nepal," the centre said, pointing that the exact causes are not known.

Exposure can also occur during installation and use of asbestos-containing products. Asbestos is used in a number of products for a number of applications, such as roofing, shingles, water supply lines, fire blankets, plastic fillers, medical packing as well as clutches and brake linings, gaskets and pads for automobiles.

"Asbestos is piled up in different parts of Kathmandu, including Maitighar, for use in road construction work. We request the ministry to manage such materials in a way that reduces potential risk to humans. It is equally important to take initiatives to gradually ban the use, import and export of such products," Ram Charitra Sah, the centre's executive director, said.

Govt bans import, use of asbestos

POST REPORT
KATHMANDU, DEC 24

The government has banned the import, purchase and use of carcinogenic mineral fibre asbestos, which is used as construction material, saying that it is causing serious public health complications.

The Ministry of Science, Technology and Environment (MoSTE), as per the provision of Environment Protection Act 1997, published a notice in Nepal Gazette on Monday to ban the hazardous asbestos sheets and related products to protect human health as well as environment from harmful consequences due to its increasing use in the construction sector. This decision

WHO has identified that all forms of asbestos are carcinogenic and cause health complications

will automatically come into effect within 181 days after the date of notification.

A study conducted by the World Health Organization (WHO) has already identified that all forms of asbestos are carcinogenic to humans and cause various other health implications. Over 40 countries have banned the import, export and use of the material within their territories.

Human health and environment were under high risk of

getting impacted from these carcinogenic asbestos sheets used massively in many places in the country, especially in the Tarai region, according to the Centre for Public Health and Environmental Development (CEPHED).

"Since last year, civil society and experts have been advocating to address the related public health and environmental problems possibly resulted from unscientific burying of asbestos wastes in Maitighar Mandala in Kathmandu and its massive import and use in the Tarai region," said Ram Charitra Sah, executive director at CEPHED. "Now we need effective implementation of this decision," he said.

Government bans import, sale, use and distribution of asbestos

Himalayan News Service
Kathmandu, December 25

The Ministry of Science, Technology and Environment has decided to impose a ban on the import, sale, distribution and use of asbestos (in corrugated tiles and insulators) as per a provision in the Environment Protection Act, 1999.

MoSTE announced the decision by publishing a notice in Section 64, Part 5 of the Nepal Gazette on December 22. The decision will automatically come into effect from the 181st day of the publication of the notice. It, however,

stated that the ban would not be applicable to asbestos lining of brake shoe and clutch plate used in motor vehicles.

According to Section 7 (3) of the Act, if it appears that the use of any type of substance, fuel, tool or device has caused or is likely to cause significant adverse impact on the environment, the MoSTE may, by a notification in the Nepal Gazette, forbid the use of such substance, fuel, tool or device.

"Using asbestos has been discouraged in Nepal. As the World Health Organisation has stated

that exposure to asbestos can cause cancer," said Jaya Ram Lamichhane, ex-president of the Federation of Contractors Association of Nepal. "Asbestos is largely used in roofing in Nepal and is mostly used in traditional buildings."

The Centre for Public Health and Environmental Development, an NGO, which has been lobbying to ban asbestos, welcomed the government's move

the government to effectively implement the health and environment-friendly decision," Ram Charitra Sah, executive director, CEPHED said. WHO and the International Agency for Research on Cancer have identified asbestos as a cancer-causing factor, prompting around 40 countries in the world to ban its export and import.

According to WHO, asbestos

is attributed to occupational cancer, including lung cancer. Exposure to asbestos occurs through inhalation of fibres primarily from contaminated air, as well as from

ambient air in the vicinity of point sources or air inside housing and buildings containing friable asbestos materials. Asbestos is used in roofing, shingles, water supply lines, fire blankets, plastic fillers, medical packing, as well as clutches, brake linings, gaskets and pads for automobiles.

Though it is said asbestos is also used in plastic materials, plastic manufacturers refute the claim. "Asbestos has never been used in plastic materials," said Sharad Sharma, president of the Nepal Plastic Manufacturers Association.

World Health Organisation has stated that exposure to asbestos is linked to cancer

and said it would help protect human health, as well as environment from negative consequences of asbestos. According to CEPHED, records at the Department of Customs show that Nepal imported about 1,195 tonnes of asbestos for use in construction work in the fiscal year 2012-13 itself.

"We have taken the decision of the MoSTE as an appropriate response to our raised concerns and would like to appreciate this timely decision and acknowledge the efforts made by the government. We also urge

HEALTH EVENTS

Call for Asbestos free South Asia

The South Asia Strategic meeting on ban of asbestos took place in Brac Inn in Dhaka yesterday. The strategic meeting brought together 20 advocates, activists, victims and trade unionists from Bangladesh, Pakistan, India and Nepal who are working towards a ban of asbestos.

The goal of the meeting is to have focused discussions on building strategies nationally with the sub-region and work on coordinated activities in South Asia in terms of diagnosis, compensation and advocacy working towards a ban in the region.

In Bangladesh, the Bangladesh Ban Asbestos Network (B-BAN) since its inception in 2013 has been working on raising awareness, education, identifying affected workers and communities especially in Chittagong and B-BAN has the backing of the regional and global advocates for the complete ban of asbestos in Bangladesh.



About CEPHED

Center for Public Health and Environmental Development (CEPHED) is an environmental NGO established in the year 2004, by and through the contribution, coordination from a group of activist and experienced people from medical, environment and public health sectors. CEPHED's focus is to serve Nepalese people and communities in the field of public health and environment. CEPHED has adopted the vision of bridging people with the science and technology for healthy leaving and environmental safety and taken a mission to act as bridging forum between people with science and technology to make access new scientific knowledge, technology and safety measures of environment and public health sector through research, advocacy, feedback, coordination, capacity building and policy dialogue, etc.

CEPHED is working with and also willing to work with group and organizations around the country from central government, local government to grass root level organizations and private sectors with an understanding that this will help to bring the experience from the ground to the concerned authorities' notice that leads to more meaningful and sustainable solutions. From past 12 years CEPHED has been engaged mainly on research, awareness raising, capacity building, policy influence especially in the area of chemical management, chemical safety, pesticide, obsolete pesticide, healthcare waste, POPs, heavy metals like mercury, lead and cadmium as well as hazardous materials like Asbestos.

Additionally, CEPHED has been actively engaged in research, production of Information, Education and Communication (IEC) materials both in printed and electronic format widely disseminating all over the country. The research results and findings have been shared with all stakeholders especially government, business communities and general public at large scale thorough all possible means such as meeting, interaction, presentation, newspaper, radio and television programs and also through organizing series of district, regional and national level awareness and capacity building training programs on these issues.

With its growing interest and engagement with various environmental issues of national and international importance, it became an active participating organization of several global networks working in the area of public health, environment and toxic free future. CEPHED is member organization of Toxic Link, International POPs Elimination Network (IPEN), Global Alliance for Incinerator Alternatives (GAIA), Collaborative on Health and the Environment (CHE) and Zero Mercury Working Group (ZMWG)/EEB. Environment Law Alliance Worldwide (ELAW), Global Alliance to Eliminate Lead Paint (GAELP), UNEP Mercury partnership, International Ban Asbestos Secretariat (IBAS), Asia Ban Asbestos Network (ABAN), The Asian Network for the Rights Of Occupational and Environmental Victims (ANROEV), World Alliance for Mercury Free Dentistry (WAMFD) and Asian Center for Environmental Health.

CEPHED has been doing research, raising awareness and at the same time setting pilot model projects. CEPHED has recently completed the feasibility study and strategy development for mercury free health care services including mercury free dentistry from there pilot projects. The second intervention made by CEPHED towards curbing the release of POPs (Dioxins, Furans) is the development of environmentally sound management of health care waste and promotion of the use of dry welding machine for metal fabricating throughout country as model program.

CEPHED works and activities has been recognized at national and international level and received honor by several national and international awards: UNDP GEF SGP Outstanding 2009 and First Prize 2012; UN POPs Convention Secretariat PCB Elimination Network's PEN Award 2011; Grill Traders Association Award 2011; Environment Conservation Award 2012, Best Paper Award on Mercury Research 2015 and Environment Conservation Award 2016 etc. CEPHED has successful in several policy influences like Mandatory Lead Paint Standard of 90 ppm; Ban of Import, Sale, Distribution and Uses of Asbestos and asbestos containing products; Banning of Import, Purchase and Uses of Mercury based equipment and expecting soon the mandatory standard for toxic chemicals in Children Toys etc.



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