



# Mongolia

## Environmental Health Country Profile

### World Health Organization

As of February 14, 2005



## 1 Development, Environment and Health Status

### 1.1 Development Pattern of the Country

#### 1.1.1 Maps / geography / demography / urban-rural trends

Mongolia is a landlocked country with an area of 1.565million km<sup>2</sup> , geographically bounded on the north by Russia and on the southeast and west by China. The population is about 2.475million of which nearly 60% live in urban areas. Of a total urban population of 1.38 million about 0.8 million live in the capital city of Ulaan Baatar (UB). Mongolia is one of the highest countries in the world with an average altitude of 1,580m above sea level. The geography and topography of the country is very diverse; from north to south there are four main areas, the mountain-forest steppe, mountain steppe, semi desert and desert. In the north and west the mountainous areas are covered with forests and there are many lakes and rivers. The grasslands of the Asian steppe cover the eastern part of the country. In the south there is the Gobi desert and about one third of the desert is in Mongolia (4)(5)(6). The climate is continental with arid and semi arid regions in the central, south and southwest area of the country. There are wide fluctuations in diurnal and annual temperatures.

Approximately two third of the population of Mongolia is under 30 years old and two fifths below 14 years of age. Much of the recent population growth has been accommodated in the urban areas together with a significant migration from the rural areas especially after severe weather events typified by the Dzud which is a term for a range of winter weather related conditions that prevent domestic animals from foraging on open grazing land. Since the beginning of economic transition (from a command economy i.e. communism to a market economy) in the 1990s the scale of Dzud events has resulted in large losses of animals and many households have been devastated and as a consequence moved into the urban areas (5)(3). Of the population in UB about 60% live in Ger areas where access to water and sanitation is limited and the unemployment rate is higher in Ger areas (30%) (7).

#### 1.1.2 General economy of the country

Traditionally the main economic activity in Mongolia has been based on agriculture and livestock with some minerals products. Until 1990 Soviet policies molded the Mongolian economy but since Soviet aid was withdrawn and the transition to a market economy commenced the Mongolia economy suffered substantially. Since 1994 there have been improvements in the growth of small-scale agriculture and generally increasing growth in both agriculture and industry. The export of mineral products represents a large proportion

(47%) of total export value. Other significant export commodities are textiles and wood. The major imports are machinery and equipment.

In terms of industrial activity the main sectors are: the mining of minerals, electricity and energy generation, manufacture of food products and the manufacture of textiles. Agricultural activities account for over 30% of the GDP in Mongolia. The main crops are wheat, potatoes and other vegetables. There are five main types of livestock, which are sheep, goats, cattle horses and camels; other main livestock includes pigs and poultry.

In 1997 Mongolia joined the World Trade Organisation (WTO). Mongolia relies to some extent on the international donor community, \$300 million being pledged on an annual basis since 1999. This figure is comparable with the export sector earnings, which is some \$150 million less than the imports into Mongolia.

The urban sector generates 61.65 of the GDP however urban poverty (39.4%) was greater than rural poverty. Many Mongolians have reacted to the economic changes by moving into the expanding informal sector and reducing family size. The informal sector is largely unregulated and therefore economic security is lacking (9).

### 1.1.3 Development priorities

The Ministry of Health is focusing on primary health services, rural health care, private health services and expanded health insurance coverage. Of relevance to environmental health the MOH drafted national programs for the prevention of accidents and injuries, promotion of physical fitness and a national health workforce plan (1). At the Public Health conference of the Ulaan Bataar (UB) Region importance was placed on eliminating poverty, providing mandatory primary education, providing gender equality, reducing maternal and infant mortality, reducing the spread of communicable diseases and the implementation of national public health programs within the framework of reaching Millennium Development Goals (MDGs). The MDG targets for 2015 for Mongolia are:

- Under 5 mortality rate – 29.2 per 1000 live births
- Maternal mortality ratio – 50 per 1000 live births
- HIV prevalence in 15-24 year old pregnant women –0
- Number of HIV/AIDS orphans –0
- TB prevalence 4 per 1000
- Percentage of population with access to safe drinking water –80
- Percentage of population with access to sanitation – 50 (2)

Priority public health issues were identified and these included in-migration, injuries and food safety, reducing environmental pollution, improving the supply of safe drinking water and food (2).

A report (3) on the public health consequences of internal migration made some recommendations of significance to environmental health. At the national policy level these were the need to develop a state policy on migration that is incorporated into National

Regional Development policy, a review of laws that limit access to basic social services and the need for a multisectoral response to this new social phenomena. At Ministerial level the recommendations were to monitor the implementation of regional and rural development programs to assess the impact of extensive urbanisation, to take a multisectoral response for the emerging social problems and to review sectoral policies that limit access of migrants to basic health services. Several recommendations were made to Ulaan Bataar City government, local government and local health organisations.

Several policies have been initiated by government to address the issues of inequality and poverty.

#### 1.1.4 Human Development Index

This is a composite index based on three parameters: longevity, as measured by life expectancy at birth; educational attainment, as measured by adult literacy and total primary, secondary and tertiary enrolment ratio; and standard of living, as measured by GDP per capita. The Human Development Report (3) indicates that Mongolia is now in the medium HDI level with an indicator of 0.668 as of 2002. Mongolia ranked 117 out of 177 countries and the GDP per capita rank minus the HDI rank was plus 21 indicating that Mongolia has been effective in converting income into human development.

Mongolia has recorded several gains in human development over recent years. The HDI showed an increase in 1999 to overtake the level established in 1990. Although the GDP is estimated to have increased by about 4% per year this is below the projected 5.5% needed to meet poverty reduction goals.

About one third of the urban population of UB lives below the poverty line and of these 10% are very poor with an expenditure level below 60% of the poverty line. The poor are typically younger, less well-educated, live in larger households and more likely to be headed by a female. Priorities for action are improving housing and sanitation conditions. Access to health services and education seems to be comparatively good but quality needs improvement (7).

### 1.2 Existing Service Levels

#### 1.2.1 Proportion of population (national) with existing utilities (water supply, sanitation, solid waste collection, drainage, sewerage, electricity)

##### Water supply

Piped network – 30.8%

Water truck – 24.8%

Water distribution kiosks – 35.7%

Spring water – 9.1%

##### Solid waste collection

Sanitation – 30.8%

Electricity – 70%

1.2.2 Proportion of urban population served by piped water, sewers, electricity, municipal solid waste collection

    piped water – 40%  
    sewers – 40%  
    electricity – 98%  
    municipal solid waste collection – 3%

1.2.3 Presence of other basic services such as fire fighting and emergency management (flood, earthquake, chemical emergency, etc.)

General Department for Disaster Protection was established in 2003 on the basis of former Civil Defense Services. Main functions of this agency are:

- Strategic planning and improving legal environment for disaster protection;
- Develop and implement training program;
- Set up information database, internal network and provide communication services;
- Prevention and analysis of fire;
- Disaster investigation and laboratory analysis during the radiological and chemical emergencies; and
- Policy and coordination of the state resources.

1.2.4 Housing: presence of building regulations, proportion of people living in informal settlements

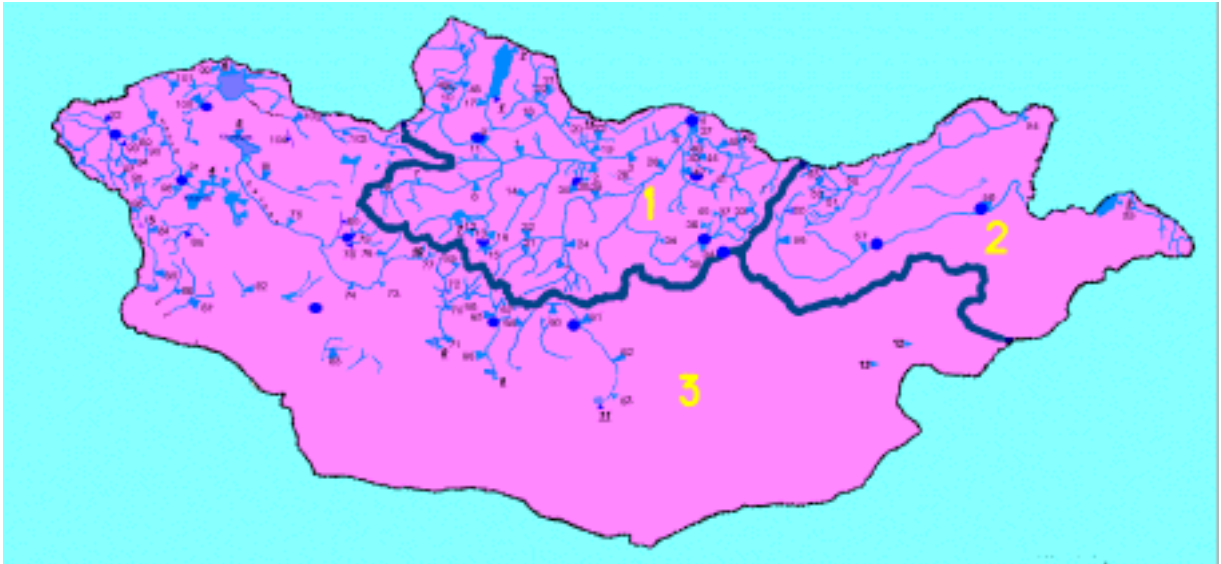
There is legislation on building and building codes are in place.

1.2.5 Transport related: number of vehicles registered, number of motorcycles registered, rate (number per 100,000 population)

    -number of vehicles - 143505  
    -number of motorcycles – 26361

1.2.6 Capacity for monitoring environmental quality (drinking water, water resources, ambient air, noise, radiation, etc)

The Ministry of Nature and Environment is responsible for surface water monitoring. There are 137 surface water monitoring points and 18 waste water monitoring points in Mongolia (Picture 1).



Picture 1. Surface water monitoring network

In 2003, 10 separate inspection agencies joined into a single State Regulatory Agency for Professional Inspection under the Prime Minister's Cabinet. This agency has branches in every 21 provinces (Picture 2).



Picture 2: Location of Agency for Professional Inspection laboratories

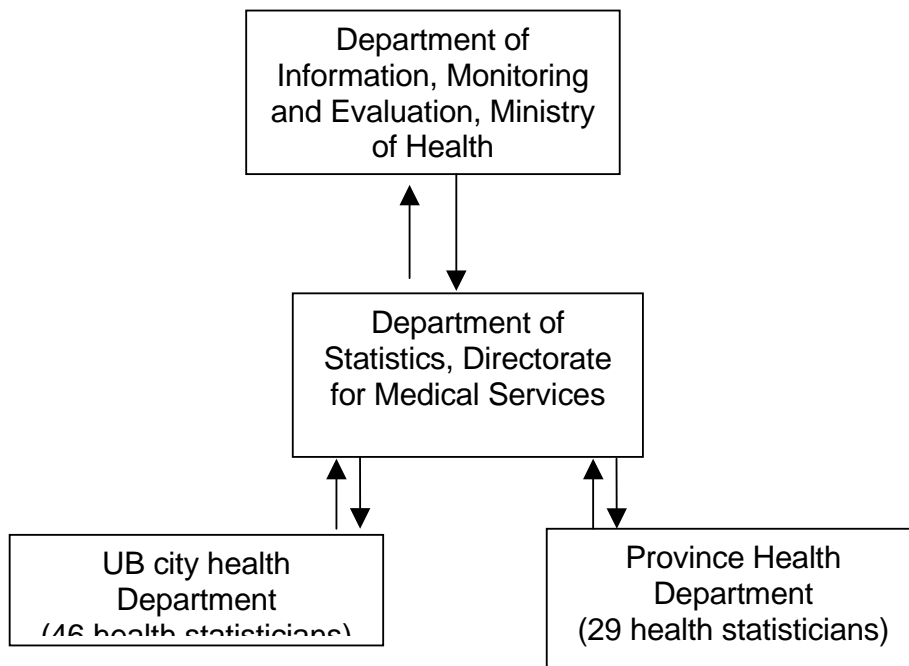
The Department for Health Inspection of this agency is responsible for drinking water quality monitoring and surveillance. Review of annual water quality data from city and provinces between 1999-2001 has been conducted. It showed that the national and

provincial laboratories have capacity to analyze 15-17 parameters in the drinking water out of 35 parameters indicated in the National drinking water standard.

Environmental radiation monitoring is routinely carried out by Radiation laboratory of Nuclear Regulatory Authority (NRA) using environmental monitoring network of the Ministry of Nature and Environment. Basic facilities are available for alpha, beta and gamma monitoring using a variety of equipment, including high resolution gamma spectrometry (15).

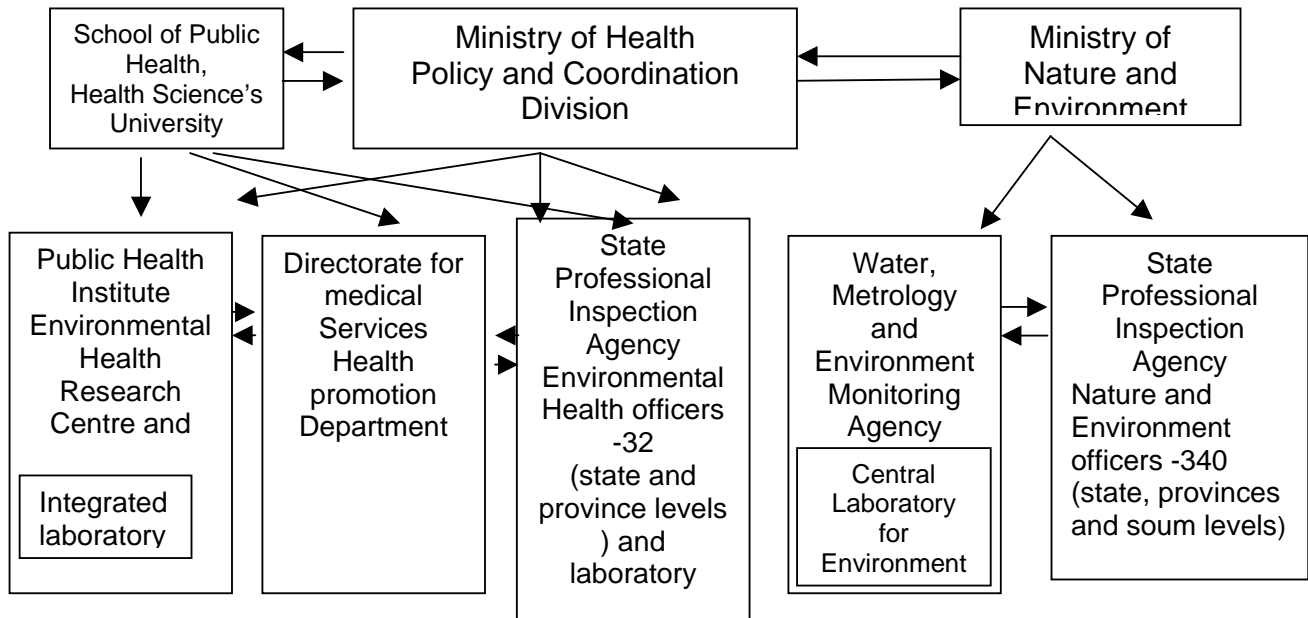
#### 1.2.7. Capacity for data collection and processing

A national health database established in Mongolia, which is useful to monitor trends of health status of the population. GIS introduced into the health information system. Health data collects from soum, province and city levels on the monthly basis. A total of 75 health statisticians work throughout the country.



Currently, some of the related data is stored at the Ministry of Nature and Environment; some of them are collected through environmental inspection authorities and some through Ministry of Health. Due to lack of comprehensive and integrated information system activities directed at environmental health protection have been carried out separately by different institutions without strong coordination and cooperation. Therefore, the MOH is considering development of a geographic information system of collection and analysis of health and environmental data to support policy making and intervention activities.

## 2.2. Institutional structure for Environmental Health



### 1.3 Environmental Quality

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#### 1.3.1 Air pollution (percentage of population using solid fuels, proportion of vehicles using diesel and unleaded gasoline, frequency of exceeding national air quality standards)

- Percentage of population using solid fuels -60%
- Proportion of vehicles using diesel – 14%
- Proportion of vehicles using unleaded gasoline – none

Several urban areas of Ulaan Baatar have polluted air at times during the year. The main sources of pollution are the power stations, which burn large quantities of coal to generate electricity and hot water as well as other large and household heating units in the urban

area. A more recent source of air pollution is the increasing number of motor vehicles, which are often poorly maintained and also use leaded fuel. As Ulaan Baatar is topographically located in a low area and the winds in wintertime are relatively weak the conditions are conducive to the build up of pollutants in the urban area. In addition to the power generation plants which use about 5 million tons of coal a year there are 75,000 Ger households which use about 200,000 tons of coal and 160,000 m<sup>3</sup> tons of wood annually.

There are four fixed air quality monitoring stations in UB and the data indicates that there has been a steady rise in the levels of SO<sub>2</sub> with current levels ranging from 12 – 50ug/m<sup>3</sup> and an average NO<sub>2</sub> level of 32ug/m<sup>3</sup> and a maximum value of 97ug/m<sup>3</sup> (14). The sulphur dioxide levels reported are close to the WHO guideline value of (50ug/m<sup>3</sup>) as an annual average (11).

There are also 13 other places in UB where measurements are made of carbon monoxide, sulphur dioxide and nitrogen dioxide. Carbon monoxide measurements indicate a range of levels from 2000 – 6000ug/m<sup>3</sup>, sulphur dioxide from 70-100ug/m<sup>3</sup> and nitrogen dioxide from 60-110ug/m<sup>3</sup> (14).

Another study of air pollution in UB has reported sulphur dioxide levels of between 12 and 109ug/m<sup>3</sup> for measurements taken over the August to October period of 2002 (12). This study also reported nitrogen dioxide levels of between 18 and 48 ug/m<sup>3</sup> (WHO guideline value for nitrogen dioxide is 40ug/m<sup>3</sup>) and lead air levels of between 18 and 60ug/m<sup>3</sup> (WHO guideline value for lead in air is 0.5ug/m<sup>3</sup> on an annual basis). There are also 19 monitoring stations in 17 other cities in Mongolia. Measurements are made of sulphur dioxide and nitrogen dioxide. Data indicated that the levels of sulphur dioxide range from 2-14ug/m<sup>3</sup> with a maximum level of 169ug/m<sup>3</sup>. For nitrogen dioxide that range is from 5-29ug/m<sup>3</sup> with a maximum level of 125ug/m<sup>3</sup>. In both cases the highest value was recorded in Darkhan, a city in the west of Mongolia.

On the basis of the information available there are higher levels of sulphur dioxide and particulates at certain times of the year particularly in the winter period with peak values more than twice the average values. As there has been a rapid increase in the number of motor vehicles there has been an increase in the levels of nitrogen dioxide in urban areas where the traffic density is highest. Although no measurements have been reported on the level of hydrocarbons in urban air this is expected to be a contributor to air pollution.

The monitoring stations also measure particulate levels and data indicates that the levels are close to the Mongolian standards for total suspended particulates (TSP) of 150ug/m<sup>3</sup> with highest values in April and May, which are the windy months of the year.

In many areas there are strong winds, which pick up dust and soil particles both from natural sources but land degradation is a contributor to this problem (4).

Recent studies have indicated that there is an association between the increased level of indoor and outdoor air pollution and respiratory symptoms in children in the urban population of UB (12)(13).

Many families in Mongolia live in dwellings where the heating and cooking facilities use coal or wood in a stove located inside the dwelling. Indoor air quality and the impact on health has been of concern for some time but little was known about the potential associations between environmental factors that can influence indoor air quality and respiratory problems, especially for children. A cross sectional study was designed to determine the prevalence of asthma, bronchitis and other respiratory symptoms in children between the ages of 2 and 8 years in two districts in Ulaanbaatar (the capital of Mongolia). The study also examined associations between respiratory symptoms and environmental and demographic factors in the dwellings (Gers, houses and apartments). The environmental factors examined included air quality by resident's evaluation, use of heaters, drying of clothes, tobacco smoking and numbers of family members in the dwelling. Indications of air level concentrations of several pollutants was assessed. The study showed that of the children involved in the study 19% had bronchitis and 1.4% had asthma with a total of 78% having respiratory symptoms. The respiratory symptoms were more common in children living in Gers and houses compared to apartments. In conclusion the results of the study indicate that there is an association between the indoor air quality in Gers and houses where coal and wood are used as fuel sources compared to apartments. Efforts need to be directed at improving indoor air quality in Gers and houses.

The Global Environment Fund has provided financial support for a project aimed at reducing coal fuel consumption in the Ger areas by the use of more efficient stoves (4).

### 1.3.2 Water pollution (frequency of exceeding national water quality standards, drinking water quality standards)

Mongolia is one of 60 countries with limited fresh water resources in the world. The total water resource of Mongolia is 0.00004% of the world water resource. On the average 22.3 million m<sup>3</sup> water is allocated in a square km and it is relatively lower to compare with the world average. In Mongolia 70% of water resources are surface water and 30% are groundwater sources. Recent surveys have revealed that unregulated over intensification of water usage combined with increased deforestation has resulted in a 17-32% decrease of surface water resources in Mongolia.

The main factor influencing the content of chemicals in Mongolian rivers is the harsh continental climate of the country. The determining factors of mineralization and chemical constituents of surface water are the content of rainfalls and of ground water, water balance of the particular year, structure of soil and geological setting.

The changes in surface water quality related to the drought and anthropogenic factor, especially gold mining and leather processing activities. The total of 784 enterprises are engaged in mining and from which 204 small scale gold mining companies are operating on 60652,98 hectares of land. Some of the gold miners are reported to use mercury in the gold extraction. The surface water inventory revealed that gold mining activity affects quality of 28 rivers in 8 provinces of Mongolia.

Currently, the studies on mercury pollution conducted by ILO (2002) and by JICA (2003) in collaboration with the Public Health Institute of the Ministry of Health revealed contamination of soil and water by mercury in Boroo gold mining area and its negative impact to human health (20). Therefore, Government of Mongolia emphasizes a need for improving technology and activity of gold mining and leather processing factories and strengthening the efficiency of sewage treatment plants.

About 60% of the population has access to a public water supply and 25% to sanitation facilities. The urban areas generally have facilities for the collection and treatment of wastewater but they are usually in a poor condition and so are not able to treat the waste to acceptable levels. There are approximately 100 water treatment plants, which have the capacity to treat some 130 million m<sup>3</sup> per year. This is less than half of the waste generated (6). In the Ger areas there is no wastewater or sewerage systems. Waste is disposed of in pit latrines, which are constructed on the same plot of land as the ger and have the potential to cause the contamination of ground water (4). Studies of water quality from the three main sources of water i.e. main water supply, transported water and spring water indicates that the latter is usually the most contaminated which could be as a result of ground water contamination in ger areas (12).

The rivers outside the urban areas are generally at the Grade I levels with high levels of Dissolved oxygen. The Tuul river which runs through UB was at Grade II level in the upper level but degrades to Grade IV in the UB area as a result of human and industrial waste contamination and pollution can be 2-12 times acceptable levels (6). Rivers in the mining and mineral processing areas can be contaminated. Also in areas where there is coal mining activity can have increased carbon waste loading and metal contamination. Very little water quality monitoring occurs and a health risk is present as a result of the lack of wastewater collection and treatment facilities (4).

The water inventory was conducted first time in 334 soums of 21 provinces in 2003 by the Ministry of Nature and Environment. There are a total of 5097 rivers of which 372 are dry, 9582 springs of which 1158 are dry and 3854 lakes of which 573 are dry (16). The ministry also established a database of water quality using a geographic information system database.



### General view of the database of rivers

About 60% of the population has access to a public water supply and 25% to sanitation facilities. The urban areas generally have facilities for the collection and treatment of wastewater but they are usually in a poor condition and so are not able to treat the waste to acceptable levels. There are approximately 100 water treatment plants which have the capacity to treat some 130 million m<sup>3</sup> per year which is less than half of the waste generated (6). In the Ger areas there is no wastewater or sewerage systems. Waste is disposed of in pit latrines, which are constructed on the same plot of land as the Ger and have the potential to cause the contamination of ground water (4). Studies of water quality from the three main sources of water i.e. main water supply, transported water and spring water indicates that the latter is usually the most contaminated which could be as a result of ground water contamination in Ger areas (12).

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The Government of Mongolia announced this year as “Year of Water” and approved General Strategy on Water up to 2025. This strategy focuses solving of the priority issues such as ecology-economical assessment of water, improve protection and quality

of water, supply of safe water, strengthen economic mechanisms and the legal environment (21).

#### National survey on arsenic

The national survey on arsenic was conducted by the Public Health Institute, MOH with UNICEF technical and financial support from October 2003 to July 2004 on a national basis. The objectives of the survey were to:

- Determine the arsenic content of the drinking water, biomaterials (nail, hair and urine) and coal;
- Determine the impact on health among the population in at risk areas;
- Provide GIS mapping of the arsenic distribution; and
- Develop recommendations and a strategic direction.

A total of 1023 wells were used in 21 aimags, UB city and railways as well as border areas, moreover 10 coal mining sites were covered in the study. Health surveys were conducted in the high arsenic areas such as Bugat, Khaliun soums of Govi-Altai, Khatanbulag and Ulaanbadrakh soums of Dornogovi, Ulziit and Undershil soums of Dzungovi aimags respectively which involved a total of 91 people who had been living more than 5 years in that area. There were 273 biological samples (hair, nail and urine) from people involved in the study which were analysed for arsenic content.

The study findings show that the country average of arsenic content in drinking water from wells is 0.014 mg/l and 10% of all samples were positive for arsenic. As the ground water was assessed by geographical region such as Govi 0.019 mg/l, Dornod flat 0.012 mg/l, Altai mountains 0.006 mg/l and Khangai-Khnetii mountains 0.0009mg/l.

The highest concentration of arsenic revealed on Govi-Sumber (0.03±0.02), Dornogovi (0.024±0.0007) Dornod (0.018±0.001), Govi-Altai (0.018±0.01) Sukhbaatar (0.017±0.002) (note all values are in mg/l) aimags which are higher than the recommended value of the WHO and National Standards (0.01 mg/l). The ground water in the Khatanbulag soum in Dornogovi aimag has the highest arsenic content at 0.075 mg/l.

Coal samples from 10 large mining sites were analysed and from Baganuur (183ppm) and Nalaikh (121ppm) had the highest levels of arsenic.

The analysis of the arsenic content in biomaterials showed that the average arsenic content in urine was 0.0038±0.007 mg/l, nail arsenic content was 1.07±0.21 mg/g. By looking at the positive arsenic content in urine and nails according to the duration of years in the area, 4.5% of people who lived for 1-5 years had arsenic in urine 5.3% in nails and 80% of the people living in the area for over 16 years had arsenic in urine and nail samples.

The health survey in the risk or high arsenic areas showed that 82.4% of the people surveyed had symptoms of arsenic poisoning, 16.5% had suspect or light symptoms and 1% moderate symptoms.

On the basis of these results recommendations for further action to manage the arsenic problems were developed.

#### Recent activities of the Ministry of Health

Review and initial analysis of annual water quality data from city and provinces between 1999-2001 has been completed.

Review and initial analysis of shallow and deep wells in Ulaabaatar city has been completed and distributed to the relevant organizations.

Study of drinking water quality at different sources:

springs

water distribution points

central water supply

Pilot testing of the “Chemical protocol of drinking water quality” developed by WHO in 2002.

Arsenic survey was conducted in three Gobi provinces and this showed elevated levels of Arsenic in some samples. Further surveys in all 21 provinces are being conducted with UNICEF support.

Water quality field test kits (16 bacteriological, 4 chemical) supplied by WHO were distributed and training for laboratory staff was conducted for the use of these test kits by the water, Engineering and Development Centre (WEDC). Therefore, local capacity to test water quality parameters of greatest health concern has been improved.

Intersectoral meetings have been held on water quality surveillance and control.

Health risk assessment of environmental pollution (including drinking water quality) in Ulaanbaatar city carried out in 2002-2003 and dissemination workshop of study results to decision makers was conducted.

Coordination of the “Healthy spring” project which was initiated by the WHO Representative’s office in Mongolia and supported by AGFUND and WPRO.

#### 1.3.3 Solid waste (generation of municipal solid waste, proportion of recyclables)

The management of solid waste is an important issue in Mongolia. There are about 450 waste collection points (open sites), which cover over 3,000 hectares of land. Of these 450 sites about 220 are in UB but the collection of waste is not well organized. In UB there it was reported that there were 3 centralised landfill sites. As there are about 0.5 million tons of waste daily these sites cannot cope and so solid waste accumulates outside populated areas. Up to the early 1990s open burning was common but this is being discouraged because of the resultant air pollution. The government has adopted a solid waste generation reduction program and a license system has been introduced for open dumps, which has resulted in the closure of several illegal sites. The recycling of solid waste is under consideration.

A survey of the composition of community solid waste was carried out in 2002 (25) and the results indicate that the waste composition was as follows:

|                            |       |
|----------------------------|-------|
| Paper                      | 13%   |
| Glass                      | 6.5%  |
| Metal                      | 2.5%  |
| Plastic                    | 11%   |
| Other organic              | 30%   |
| Other inorganic            | 36.5% |
| Household hazardous wastes | 0.02% |
| Special wastes             | 0.06% |

Based on visual inspection there was reported to be a strong informal sector for the recycling of several materials from the waste stream (25).

The management of solid waste is an important issue in Mongolia. During the last years improved legal climate with respect to municipal and hazardous waste management. For instance, in 2001-2002 the Government approved two decrees related to the improvement of solid waste management and hazardous waste management. Health Care Waste Management Improvement Regulation was approved in October 2002. The law on municipal and industrial waste was approved in 2003. However there is a need to improve implementation of legislation on the basis of introducing environmentally friendly technology for collection, transportation and disposal of solid waste and behavior change of the people.

The Ministry of Health and Ulaan Baatar City Upgrading Service conducted an initial comprehensive waste characterisation study and market analysis for recyclable materials in Ulaan Baatar with technical assistance from the WHO (25). The quantity and composition of wastes were analyzed by source of waste generator, district and entire city. Among the findings of the study were:

- (a) the major source of waste include Ger areas (48%), apartments (32%), and offices, shopping centers and restaurants (17%),
- (b) approximately 3% of the waste was collected from the street;
- (c) waste contained about 43% organic matter and substantial quantities of ash, and the main materials to be considered as highest priority for recycling are paper, glass and some plastics.

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#### 1.3.4 Hazardous waste (generation of toxic chemicals, hazardous materials, health-care waste, nuclear waste)

After the ratification of the Basel Convention a database for the registration and classification of toxic chemicals is being developed along with some legislation to deal with hazardous wastes.

- The Regulation on Improvement of Health Care Waste Management was approved in 2001 by the joint decree of Ministers of Health and Nature & Environment.
- Regulation on segregation, collection, processing, storage and disposal of hazardous waste was approved by the Government decree No.135 in 2002.

At present, the generation of unsealed radioactive waste material is not considered to be a problem, but the situation could change with the development of new phosphate, oil, gas and uranium industries. Mongolia does not produce the radioactive material. Amount of the radioactive waste is respectively low and mostly is generated from the spent sources of medical and industrial practices.

There is a need to strengthen mechanisms for enforcement of the existing laws and regulations and substantial financial investment to improve a system for transport, handling, storage and disposal of hazardous wastes.

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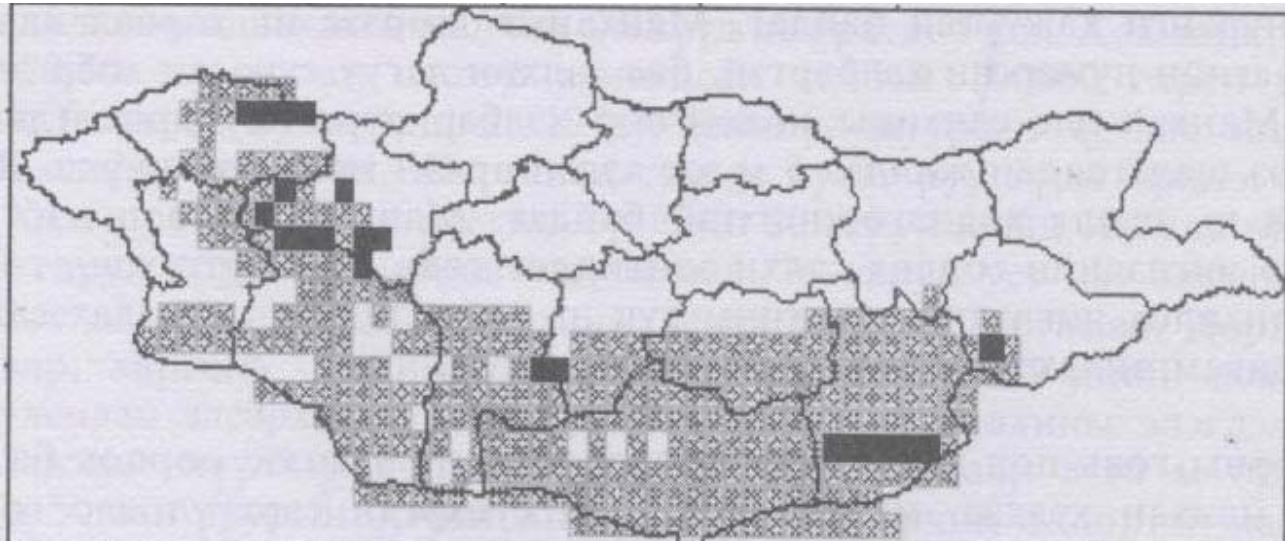
#### 1.3.5 Climate change

The National Agency for Meteorology, Hydrology and Environmental Monitoring of Mongolia is the national implementing agency for UNFCCC. The primary aspects of activities are the assessment of technology transfer needs in the Mongolian energy sector, public awareness and education and the enhancement of national capacities to prepare national communications (8).

The Government of Mongolia signed to the “International Convention Against Desertification” in 1994 and the Parliament approved it in 1996. In last 40 years sandy areas have increased by 38000 hectares of land of which 88% is in Gobi-desert and 12% is in northern part of the country ().

Mongolia joined to the UN basic Convention on “Climate change” in 1993 and the National Programme on “Climate change” was approved in July 2002.

During the last 30 years the annual air temperature has warmed by 1.38·C (1.79 ·C in winter and 1.03 in summer) and the total annual rain/snowfall has increased by 3.6 mm (*Climate prognosis, Mijiddorj etc, 1998*).



Areas of desertification in Mongolia

#### 1.4 *Public Health Statistics*

##### 1.4.1 Ten leading causes of mortality and morbidity

The ten leading causes of mortality in 2003 were: disease of the circulatory system, neoplasms, injury, poisoning and certain other consequences of external causes, diseases of the digestive system, diseases of the respiratory system, certain infectious diseases and parasitic diseases, diseases of the genitourinary system, diseases of the nervous system and sense organs and other

The ten leading causes of morbidity per 10000 of the population in 2003 were: diseases of the respiratory system, diseases of the genitourinary system, diseases of the circulatory system, diseases of the digestive system, diseases of the nervous system, diseases of the musculoskeletal system and connective tissue, diseases of the skin and subcutaneous tissue, injuries, poisoning and certain other consequences of external causes, certain infectious and parasitic diseases, and mental and behavioural disorders (2).

1.4.2 Diseases associated with agricultural and irrigation development (proportion of undernourished people, schistosomiasis, pesticide poisoning)

1.4.3 Respiratory diseases related to outdoor air pollution from energy, transport and industry sectors

1.4.4 Traffic crashes (mortality due to traffic accidents, rate: deaths /100,000 population, injuries due to traffic accidents, rate: injuries/100,000 population)

1.4.5 Diseases relating to poor housing (including pulmonary diseases, tuberculosis)

1.4.6 Water supply and sanitation-related diseases (such as diarrheal diseases, hepatitis, cholera, typhoid)

1.4.7 Vector-borne diseases (such as malaria, plague, dengue fever and dengue hemorrhagic fever)

## **2 Legal, Policy, and Institutional Structure**

### *2.1 Legislative and Policy Framework*

The Government of Mongolia is giving important emphasis to the development and strengthening of the legal environment in the area of Environmental Health (20).

The Mongolian Government pledged to achieve the Millennium Development goals.

State Policy on Public Health, Parliament decree No.81, 2001. This is a policy document, which emphasizes environmental health as a cornerstone of public health and provides strategic directions for the improvement of environmental health in order to protect the health and well being of the population (18).

Policy on Ecology. A fundamental principle of the Mongolian state environmental policy is that economic development must be in harmony with the extraction and utilisation of natural resources and that air, water and soil pollution will be controlled.

Sustainable Development Concept for the 21<sup>st</sup> century was approved. In April 1996, Mongolia's National Council for Sustainable Development was established to manage and organise activities related to sustainable development in the country. The country's strategy is designed for environmentally friendly, economically stable and socially wealthy development, which emphasises people as the determining factor for long-term sustainable development (26).

State policy on Environmental Impact Assessment was in place in 1998.

#### 2.1.1 National policies, plans or strategies for environmental health

- “Water –XXI” general strategy from 2004 up to 2025 (19)
- National program on Water (1999) and plan of action (2002-2006)
- Plan of action on improvement of solid waste management, Government decree No.256, 2001
- Regulation on removal and disposal of hazardous waste, Government decree No.135, 2002

The Ministry of Health in collaboration with other relevant ministries is working on development of the National Programme on Environmental Health.

### 2.1.1 Relevant legislation addressing environmental health issues (such as Public Health Act, Clean Air Act, environmental / health impact assessment)

The following relevant legislation is in place.

- Constitution of Mongolia, 1992
- The law on Health, 1998, 2000, 2002, 2003
- The Law of Mongolia on Sanitation, 1998
- The Law on Environmental Protection, 1995, 2002
- The law on Air, 1995
- The law on Water, 1995, 2004
- The law on Land, 2002, 2003
- The law on Protection from toxic chemicals, 1995, 2000, 2001
- The law on EIA 1998
- The law on prohibition of import transboundary movement and export of hazardous wastes, 2000
- The law on Radiation protection and safety, 2001, 2003
- The law on urban water supply and sanitation, 2002
- The law on Municipal and industrial waste, 2003
- The law on Disaster protection, 2003

In order to protect water resources, prevent pollution and improve efficiency of wastewater treatment draft law to introduce polluter pay principle is being developed

### 2.1.2 Decentralization and / or privatization policies dealing with environmental health

## 2.2 *Institutional Structure for Environmental Health*

### 2.2.1 Administrative / organizational set-up of the country (at all levels or as appropriate)

The Environmental Health Research Centre of the Public Health Institute is responsible for research and postgraduate training in this field. It has 4 sections (1.Environmental hygiene, 2.Epidemiology of non-communicable diseases, 3.Occupational health and Child and adolescent health and 4.Reproductive health) and 15 staff. The Centre works closely with Health Promotion Department of the Directorate for Medical Services.

The Health Inspection Department of the State Professional Inspection Agency (SPIA) is responsible for environmental health control and monitoring in the country. There are a total of 32 environmental health inspectors work nationwide. They control on drinking water quality, soil pollution, chemical safety, consumer products and hygienic condition of water supply and sanitation utilities.

Graduates from the School of Public Health, HSU work in the field of environmental health and occupational health and safety. On average 20-25 students graduate from this school every year with qualifications in hygiene and epidemiology.

The Environmental Inspection Department of SPIA is responsible for the control of the implementation of environment related legislation. It has branches in all provinces and has nature and environment inspector in every soum (administrative unit of province). They control and monitoring on urban air quality, water and natural resources. These two departments operate closely and conduct joint inspection to avoid duplication.

2.2.2 Role of government, private sector, non-government organizations, international organizations and partnerships in environmental health

2.2.3 Agencies involved and their respective functions (or in a table matrix)

Update matrix from JICA review

2.3 *Relevant International Conventions and Agreements Ratified or Signed*

See appendix I

### **3 Human Resources Development Programs**

3.1 *Environmental health workforce, professionals and their skills*

There are 400 people with a science degree in medicine and of these 1/3 have a science degree in Public Health.

- Science degree in Environmental Health -3 and PhD -11,
- PhD in occupational Health and Safety -3
- PhD in Child and Adolescent health – 15
- PhD in Food Hygiene – 13

The MOH is giving emphasis to capacity building in the area of environmental health. Professional skills on EHIA are being developed in collaboration with WHO.

3.2 *Formal and informal training programs for environmental health*

The formal training in environmental health started in 1963 in the faculty of Hygiene and Health Administration at the Mongolian National Medical University. This faculty was expanded and the School of Public Health was founded in 2002.

During this time a total of 838 people graduated with the Bachelor's degree in Hygiene and Epidemiology and of those 57 people specialized in Environmental Health and 37 in Occupational Health and Safety through the postgraduate training program.

The curriculum of the bachelor's degree in Public health was revised in 2001. Currently, a curriculum of Master of Public Health is being developed with collaboration of SOROS foundation. Environmental health is included in this curriculum as a core course.

Framework of training program at the School of Public Health, HSU

- Bachelor's training – 5 years
- Postgraduate training:
  - Specialization course – 6 months
  - Advanced course – 3 months
  - Fellowship course – 3 or 6 months
- Master's course on Public Health – 2 years.
- PhD program – 3 years

### 3.2 *Government certification*

The licensing system of health professionals was introduced in 1998. The Licensing Department of the Directorate for Medical Services is responsible for licensing health professionals in the country. They issue the license certificate to health professionals according to the requirements stated in the chapter 17 of the Health Law of Mongolia (provisions of the chapter 17 of the Health Law) (16).

### 3.4 *Professional associations*

The professional committee on Hygiene was established in 2004 at the Ministry of Health. Its role is to define main hygiene issues and advise the ministry in regards to taking appropriate actions.

The Public Health Association of Mongolia (2003) and Association of Public Health Professionals in Mongolia (2003) collaborate with government and non-government organizations in the field of public health. However, currently, there is no strong professional association for environmental health in the country (16).

## 4 **Priority Environmental Health Issues (by sector)**

General priorities

- Develop and implement a National Program on Environmental Health;
- Improve human resources and lab capacity in EH;
- Enforcement and improvement of existing environmental health related legislation

- Improve the national capacity for the environmental health impact assessment and integrate EHIA into EIA;
- Upgrade people's knowledge, habits and practice in environmental health and community participation;

4.1 *Agriculture Sector* such as pesticide poisoning, irrigation runoff laden with fertilizer and pesticides, contamination of water resources, pesticide residues on vegetables

The prevention of zoonosis diseases, registration and information of pesticide poisoning (23).

4.2 *Energy Sector* such as air pollution, noise, thermal pollution, fly ash and sludge disposal, nuclear wastes

The introduction of environmentally friendly fuel policy,

4.3 *Industry Sector* such as air and water pollution, chemical emergencies, hazardous waste management

Industrial waste management (mining, leather processing etc), occupational health related diseases

4.4 *Transport Sector* such as road safety, traffic crashes, ambient air pollution, noise

Road safety and traffic accidents, vehicle emissions

4.5 *Urban /Rural Development Sector* such as water supply systems, sanitary facilities, sewerage system, safe and adequate drinking water, solid waste management, drainage and flood control, good housing design and location, safe recreational waters

Urban water supply and protection of water sources, efficiency of sewerage and sewage treatment plants, sewerage system in gher areas, city planning

4.6 *Cross-cutting issues* such as health care waste, infectious / communicable diseases, vector-borne diseases, effects of climate change

Environment sector. Air quality monitoring and intervention activities, chemical safety and collection and disposal of municipal and hazardous waste

Health sector. Health care waste management and waste disposal facility, vector-borne disease control and surveillance and water-borne disease surveillance.

## 5 Areas Requiring Improvement

- 5.1 *Specific policies and legislation for environmental health* (where absent in the country)
- 5.2 *Institutional development and intersectoral collaboration* (strategies forging partnerships)
- 5.2 *Human resources development* (especially preparedness and response)
- 5.4 *Monitoring and surveillance* (including management of information)
- 5.5 *Integration of health and environment in international/regional agreements*
- 5.6 *Others*

### References (complete citations)

1. Country Health Profile – Mongolia WPRO WHO [www.wpro.who.int/chips](http://www.wpro.who.int/chips) 17 August 2004
2. MOH Health Sector Report 2003. MOH: Mongolia
3. Survey Report on Internal Migration and its Public Health Consequences. 2003 WHO/MOH/DMS: Ulaan Bataar.
4. Mongolia Environment Monitor 2002. World Bank: Ulaan Baatar.
5. Mongolia. Lonely Planet [www.lonelyplanet.com/destinations/north\\_east\\_asia/mongolia](http://www.lonelyplanet.com/destinations/north_east_asia/mongolia) 20 August 2004.
6. County Profile on Environment Mongolia 2002. Planning and Evaluation Department. JICA
7. Urban Poverty and In-Migration Survey report 2004 Ministry of Labour and Social Welfare/UNDP/Population Teaching and Research Centre University of Mongolia. Ulaan Baatar.
8. Transfer needs in the Mongolian energy sector. [www.mongolclimate.mn/mcco\\_studies5.htm](http://www.mongolclimate.mn/mcco_studies5.htm)
9. Human Development Report Mongolia 2003. Government of Mongolia/UNDP: Ulaan Baatar.
10. Ministry of Nature and Environment Annual Report 2002. MNE: Ulaan Baatar.
11. Air Quality Guidelines 2000. WHO: Geneva
12. Preliminary Health Risk Assessment of Environmental Pollution in UB, Mongolia. 2003. WHO/MOH/PHI: Ulaan Baatar.
13. Ministry of Nature and Environment Annual Report 2000. MNE: Ulaan Baatar
14. Ministry of Nature and Environment Annual Report 2003. MNE: Ulaan Baatar
15. Country Report – Mongolia for the IAE/RCA Review Meeting of NFP on Radiation Protection Beijing 2004. Nuclear Energy Commission: Ulaan Baatar.
16. Ministry of Health – Mongolia 2004
17. The Health law of Mongolia (1998, 2002, 2003).
18. State Policy on Public Health, Parliament decree No.81, 2001.
19. “Water –XXI” general strategy from 2004 up to 2025, Government decree No.57, 2004.

20. Environmental health related legislation and regulations, UB, 2004.
21. The law on Water, 1995, 2004.
22. Historic development of Public Health in Mongolia, L.Narantuya, Sh.Enkhtsetseg etc, UB, 2002.
23. Recommendations from intersectoral meeting on “Environmental health and zoonotic diseases”, UB, April 2003;
24. The law on Disaster protection, 2003.
25. Waste Characterisation Study, UB, Mongolia 2002. WHO/MOH/City Inspectorate.
26. Mongolia’s Agenda 21
27. R.Mijiddorj, Sh.Bayasgalan, Ts.Naranchuluun and B.Altantsetseg. Methodological problems of Environmental Impact assessment, Ministry of nature and Environment and Ecology and Sustainable Development center of the Mongolian University of Science and Technology, Ulaanbaatar, 2002

## Appendices

### Appendix I - Relevant International Conventions and Agreements Ratified or Signed

1. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, March 1989. Ratified 5 December 1996.
2. Vienna Convention for the Protection of the Ozone Layer, September 1989. Ratified 16 October 1995.
3. Montreal Protocol on Substances that Deplete the Ozone Layer, June 1991. Ratified 16 October 1995.
4. United Nations Framework Convention on the Climate Change, June 1992. Ratified June 1993.
5. Kyoto Protocol to UN Framework, December 1997. Ratified July 1999.
6. Convention on Biological Diversity, June 1992. Ratified 1 June 1993.
7. Convention on International Trade in Endangered Species of Fauna and Flora, 1973. Ratified May 1995.
8. Convention on Wetlands of International Importance Especially for Waterfowl Habitats, 1971. Ratified 5 June 1997.
9. Convention on the Conservation of Migratory Species of Wild Animals, 1979. Ratified 24 June 1999.
10. United Nations Convention on Combat of Desertification, October 1994. Ratified 22 August 1996.
11. Rotterdam Convention on the Prior Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, September 1998. Ratified 13 October 2000.
12. Agreement between the Government of Mongolia and the Government of China on Cooperation in Environmental Protection, May 1990.
13. Agreement between the Government of Mongolia and the Government of Kirgiz on Cooperation in Environmental Protection, July 1993.

14. Agreement between the Government of Mongolia and the Government of Russia on Cooperation in Environmental Protection, February 1994.
15. Agreement between the Government of Mongolia and the Government of China on the Protection and usage of Transboundary Water Courses, April 1994.
16. Agreement between the Government of Mongolia and the Government of Russia on the Protection and usage of Transboundary Water Courses, February 1995.
17. Agreement between the Government of Mongolia and the Government of Russia on Cooperation in Meteorology and Environmental Monitoring, April 1995.
18. Tripartite Agreement between Mongolia, Russia and China on International Protected Areas, March 1994.

**MONGOLIA**  
**Environmental Health Data Sheet**  
**As of 16 November 2004**

|          | INDICATORS   | DATA    | Year | Source |
|----------|--|---------|------|--------|
| <b>1</b> | <b>Development, Environment and Health</b>                   |         |      |        |
| 1.1.1    | Area (1000 km <sup>2</sup> )                                 | 1565.00 | 2002 | 1      |
| 1.1.1    | Estimated population ('000)                                  |         |      |        |
|          | - Total  | 2475.40 | 2002 | 1      |
|          | - Male   | 1228.10 | 2002 | 1      |
|          | - Female   | 1247.30 | 2002 | 1      |
| 1.1.1    | Annual population growth rate (%)                            | 1.3     | 2002 | 1      |
|          | Percentage of population                                     |         |      |        |
|          | - 0-14 years   |         |      |        |
|          | > Total  | 32.60   | 2002 | 1      |
|          | > Male   | 32.84   | 2002 | 1      |
|          | > Female   | 32.44   | 2002 | 1      |
|          | - 65+ years  |         |      |        |
|          | > Total  | 3.50    | 2002 | 1      |
|          | > Male   | 3.05    | 2002 | 1      |
|          | > Female   | 3.97    | 2002 | 1      |
| 1.1.1    | Urban population (%)   | 57.40   | 2002 | 1      |
| 1.1.1    | Adult literacy rate (%)                                      |         |      |        |
|          | - Both sexes   | 97.80   | 2002 | 3      |
|          | - Male   | 98.00   | 2002 | 3      |
|          | - Female   | 97.50   | 2002 | 3      |
| 1.1.1    | Under-five mortality rate (per 1000 live births)             | 31.30   | 2003 | 5      |
| 1.1.1    | Newborn infants weighing at least 2500g at birth (%)         | 3.20    | 2003 | 5      |
| 1.1.2    | General economy: narrative report (separate sheet)           |         |      |        |
| 1.1.2    | Per capita GDP at current market prices (US\$)               | 447.40  | 2002 | 1      |
| 1.1.2    | Total health expenditure on health as % of GDP               | 4.70    | 2002 | 4      |
| 1.1.3    | Development priorities: narrative report (separate sheet)    |         |      |        |
| 1.1.3    | Land area for agriculture (as percentage of total land area) |         |      |        |
| 1.1.4    | Human development index (Highest = 1)                        | 0.68    | 2002 | 3      |
|          | Human development index Rank (out of 175 countries)          | 115     | 2002 | 3      |
| 1.2.1    | Population with access to safe water (%)                     |         |      |        |
|          | - Total  | 41.50   | 2002 | 2      |

|                | INDICATORS  | DATA                 | Year | Source |
|----------------|---|----------------------|------|--------|
|                | - Urban   | 69.00                | 2002 | 2      |
|                | - Rural   | 27.50                | 2002 | 2      |
| 1.2.1          | Population with adequate excreta disposal facilities (%)                                  |                      |      |        |
|                | - Total   | 40.20                | 2002 | 2      |
|                | - Urban   | 45.30                | 2002 | 2      |
|                | - Rural   | 37.50                | 2002 | 2      |
| 1.2.1          | Solid waste collection (% of total waste generated)                                       | 17774m3              | 2003 | 12 (2) |
| 1.2.1          | Proportion of urban population served by municipal solid waste collection (%)             | Est 30%              | 2002 | 11     |
| 1.2.2?         |   | 97500tn              | 2003 | 12 (2) |
| 1.2.2          | Proportion of urban population served by sewerage system (%)<br>National or major city    | 46%                  | 2000 | 10     |
| 1.2.1<br>1.2.2 | Proportion of population with electricity (%)<br>Total<br>Urban<br>Rural                  | 67.3<br>94.6<br>34.1 | 2000 | 1      |
| 1.2.3          | Poison center service (Y/N list, year)  | Y                    | 2004 | 7      |
| 1.2.3          | Chemical emergency preparedness (Y/N list, year)  | N                    | 2004 | 12     |
| 1.2.4          | Proportion of population living in informal settlements (%)                               |                      |      |        |
| 1.2.4          | Presence of building regulations and inspection (Y/N list, year)                          |                      |      |        |
| 1.2.5          | Number of registered vehicles   | 143505               | 2004 | 7      |
|                | Rate (number per 100,000 population)  |                      |      |        |
|                | Number of registered motorcycles  | 26361                | 2004 | 7      |
|                | Rate (number per 100,000 population)  | 3800                 | 1999 | 10     |
| 1.2.6          | Presence of government/private laboratories and equipment for monitoring                  |                      |      |        |
|                | Drinking water (Y/N; G/P)   | Y; G                 | 2003 | 12     |
|                | Water resources (Y/N ; G/P)   | Y; G                 | 2003 | 12     |
|                | Ambient air (Y/N ; G/P)   | Y ; G                | 2003 | 12     |
|                | Noise (Y/N ; G/P)   | N                    |      | 12     |
|                | Radiation (Y/N ; G/P)   | Y ;G/P               | 2003 | 12     |
| 1.2.7          | Presence of government/private system for data collection and processing (Y/N; G/P)       |                      |      |        |
| 1.3.1          | Proportion of population using solid/biomass fuels for cooking or heating (%) Traditional | 3.3%                 | 2001 | 8      |
| 1.3.1          | Proportion of vehicles using diesel (%)   | 14%                  | 2004 | 7      |
| 1.3.1          | Proportion of vehicles using unleaded gasoline (%)  | 0%                   | 2004 | 7      |

|                 | INDICATORS  |  | DATA      | Year                              | Source    |
|-----------------|---|--|-----------|-----------------------------------|-----------|
| 1.3.1           | Average number of times national air quality standards are exceeded in a year:<br>a. short-term (1-hour average) frequency of exceedance<br>b. long-term (8-hour average) frequency of exceedance |  | Est 4-5   | 2002                              | 12        |
| 1.3.2           | Average number of times national water quality standards are exceeded in a year<br>a. In three major rivers<br>b. In major drinking water supplies  |  |           |                                   |           |
| 1.3.2           | Industries generating wastewater (number) m <sup>3</sup>  |  | 118m      | 2002                              |           |
| 1.3.3           | Solid waste generated (kg/per capita/day)   |  | 0.334     | 2003                              |           |
| 1.3.3           | Solid waste generated (tons per year)   |  | 97500tons | 2003                              |           |
| 1.3.3           | Proportion of recyclable solid waste (%)  |  |           |                                   |           |
| 1.3.4           | Toxic and hazardous wastes generated (tons/year)  |  |           |                                   |           |
| 1.3.4           | Industries generating toxic and hazardous wastes (number)   |  |           |                                   |           |
| 1.3.4           | Health-care waste generation (tons per year)  |  |           |                                   |           |
| 1.3.4           | Nuclear waste generation (tons per year)  |  |           |                                   |           |
| 1.4.2           | Cases of pesticide poisoning (number)   |  |           |                                   |           |
| 1.4.2           | Proportion of undernourished population (%)   |  |           |                                   |           |
| 1.4.2           | Prevalence of underweight children under five years of age (%)  |  |           |                                   |           |
| 1.4.4           | Motor and other vehicle injuries (number)   |  | 8719      | 2002                              | 2         |
| 1.4.4           | Road traffic crashes:   |  |           |                                   |           |
|                 | Number of accidents (within a year)   |  |           |                                   |           |
|                 | Rate (Accident per 100,000 population)  |  |           |                                   |           |
|                 | Rate (Accident per 10,000 vehicle registration)   |  |           |                                   |           |
|                 | Rate (Injuries per 10,000 vehicle registration)   |  |           |                                   |           |
|                 | Rate (deaths per 100,000 population)  |  | 22        | 2002                              | 9         |
| 1.4.1-<br>1.4.7 | Ten leading causes of morbidity   |  | Number    | Rate per<br>100 000<br>population |           |
|                 | 1. Diseases of the respiratory system   |  | 209 165   | 8506.23                           | 2002<br>2 |
|                 | 2. Diseases of the digestive system   |  | 156 198   | 6352.19                           | 2002<br>2 |
|                 | 3. Diseases of genitourinary system   |  | 148 973   | 6058.37                           | 2002<br>2 |
|                 | 4. Diseases of the circulatory system   |  | 110 536   | 4495.23                           | 2002<br>2 |
|                 | 5. Injuries, poisoning and other consequences of external causes  |  | 76 373    | 3105.90                           | 2002<br>2 |

|                 | INDICATORS   |                 | DATA                              | Year | Source |
|-----------------|--|-----------------|-----------------------------------|------|--------|
|                 | 6. Infectious and parasitic diseases                                     | 39 273          | 1597.14                           | 2002 | 2      |
|                 | 7. Diseases of the nervous system  | 41 794          | 1699.66                           | 2002 | 2      |
|                 | 8. Diseases of skin and subcutaneous tissues                             | 32 499          | 1321.65                           | 2002 | 2      |
|                 | 9. Mental and behavioral disorders                                       | 25 105          | 1020.96                           | 2002 | 2      |
|                 | 10. Diseases of the eye and adnexa                                       | 25 313          | 1029.42                           | 2002 | 2      |
| 1.4.1-<br>1.4.7 | Ten leading causes of mortality  | Number          | Rate per<br>100 000<br>population |      |        |
|                 | 1. Diseases of the circulatory system                                    | 5484            | 223.02                            | 2002 | 2      |
|                 | 2. Tumors and neoplasms  | 3202            | 130.22                            | 2002 | 2      |
|                 | 3. Injuries, poisoning and other consequences of external causes         | 1969            | 80.07                             | 2002 | 2      |
|                 | 4. Diseases of the digestive system                                      | 1174            | 47.74                             | 2002 | 2      |
|                 | 5. Diseases of the respiratory system                                    | 1089            | 44.29                             | 2002 | 2      |
|                 | 6. Certain conditions originating in the perinatal period                | 475             | 19.32                             | 2002 | 2      |
|                 | 7. Infectious and parasitic diseases                                     | 417             | 16.96                             | 2002 | 2      |
|                 | 8. Diseases of genitourinary system                                      | 343             | 13.95                             | 2002 | 2      |
|                 | 9. Diseases of the nervous system  | 260             | 10.57                             | 2002 | 2      |
|                 | 10. Congenital malformations, deformations and chromosomal abnormalities | 142             | 5.77                              | 2002 | 2      |
|                 |  | Number of cases | Number of deaths                  |      |        |
| 1.4.5           | Tuberculosis (All types)   | 3829            | ...                               | 2002 | 6      |
| 1.4.5           | Rheumatic fever and rheumatic heart diseases                             | 16 066          | 93                                | 2002 | 2      |
| 1.4.6           | Acute respiratory infections   | 147 863         | 752                               | 2002 | 2      |
| 1.4.6           | Hepatitis viral  | 9664            | 35                                | 2002 | 2      |
| 1.4.6           | Cholera  | 0               | 0                                 | 2002 | 2      |
| 1.4.6           | Typhoid fever (and paratyphoid fever)                                    | 21              | 4                                 | 2002 | 2      |
| 1.4.6           | Encephalitis   | 0               | 0                                 | 2002 | 2      |
| 1.4.6           | Diarrhoeal diseases  | 16 018          | 161                               | 2002 | 2      |
| 1.4.7           | Plague   | 6               | 2                                 | 2002 | 2      |
| 1.4.7           | Malaria  | ...             | ...                               |      |        |
| 1.4.7           | Dengue/DHF   | ...             | ...                               |      |        |
|                 | INDICATORS   |                 | DATA                              | Year | Source |

|          | INDICATORS   | DATA                  | Year      | Source |
|----------|--|-----------------------|-----------|--------|
| <b>2</b> | <b>Legal, Policy, and Institutional Structure</b>  |                       |           |        |
| 2.1.1    | National environmental health policy (Y/N list, year)  | Y                     | 1997      | 19     |
| 2.1.1    | National environmental policy (Y/N list, year)   | Y                     | 1998      | 11     |
| 2.1.1    | Policies/legislation to reduce exposure to environmental tobacco smoke (Y/N list, year)  | Y                     | 2003      | 12     |
| 2.1.1    | National policies for healthy settings (such as healthy cities) (Y/N list, year)   |                       |           |        |
| 2.1.2    | Environmental/Health Acts promulgated: (Y/N list, year)<br>a. Water<br>b. Air<br>c. Solid Waste<br>d. Toxic chemicals/Hazardous Waste<br>e. Others | Y<br>Y<br>Y<br>Y<br>Y | 2003      | 12     |
| 2.1.2    | Environmental impact assessment as an official requirement (Y/N list, year)  | Y                     | 1998/2004 | 12     |
| 2.1.2    | Health impact assessment as part of EIA (Y/N list, year)   | Y                     |           |        |
| 2.1.3    | Policies for decentralization such as for environmental health and monitoring (Y/N list, year)   |                       |           |        |
| 2.1.3    | Policies for privatization such as for environmental health and monitoring (Y/N list, year)  |                       |           |        |
| 2.2.1    | Organizational structure for environmental health (separate sheet)   |                       |           |        |
| 2.2.2    | List of agencies and partners for environmental health other than government (separate sheet)  |                       |           |        |
| 2.2.3    | List of government agencies and their functions (separate sheet as a table matrix)   |                       |           |        |
| 2.3      | Relevant international conventions/agreements (List, year signed/ratified)   |                       |           |        |
|          | INDICATORS   | DATA                  | Year      | Source |
| <b>3</b> | <b>Human Resources Development Programs</b>  |                       |           |        |
| 3.1      | Environmental Health workforce   |                       |           |        |
|          | - environmental health officers  |                       |           |        |
|          | - health/sanitary inspectors   |                       |           |        |
|          | - assistant sanitarians  |                       |           |        |
|          | - environmental engineers  |                       |           |        |
|          | - sanitary engineers   |                       |           |        |
|          | - pollution control officers   |                       |           |        |
|          | - others   |                       |           |        |
| 3.2      | Tertiary degrees related to environmental health (Y/N list)  |                       |           |        |

|              | <b>INDICATORS</b>  | <b>DATA</b> | <b>Year</b> | <b>Source</b> |
|--------------|--|-------------|-------------|---------------|
| 3.2          | Short courses and duration related to environmental health (Y/N list)                                |             |             |               |
| 3.3          | Government certification for environmental workforce (Y/N list)                                      |             |             |               |
| 3.4          | Professional associations related to environmental health (Y/N list, memberships)                    |             |             |               |
| 3.4          | International associations' local affiliates (Y/N list, memberships)                                 |             |             |               |
|              | <b>INDICATORS</b>  | <b>DATA</b> | <b>Year</b> | <b>Source</b> |
| <b>4</b>     | <b>Priority Environmental Health Issues</b>  |             |             |               |
| 4.1          | Soil erosion (mm/year)   |             |             |               |
| 4.1          | Fertilizer consumption (metric tons/year)  |             |             |               |
| 4.1          | Pesticide consumption (metric tons/year)   |             |             |               |
| 4.1          | Banned pesticides used (number)  |             |             |               |
| 4.1          | Water resources withdrawal for irrigation (annual withdrawal as percentage of total water resources) |             |             |               |
| 4.1          | Irrigated agricultural area (1000 ha)  |             |             |               |
| 4.2 -<br>4.6 | Inputs from Chapter 1  |             |             |               |
| 4.6          | Carbon dioxide emissions (per capita metric tons)  | 3.1         | 2000        | 8             |
| 4.6          | Consumption of ozone-depleting CFCs (ODP metric tons)  |             |             |               |

**Notes:**

- ... Data not available.
- Est. Estimate
- p Preliminary
- NR Not relevant
- <sup>a</sup> Computed by Health Information and Evidence for Policy Unit of the WHO Regional Office for the Western Pacific.

**Sources:**

- 1 Mongolian Statistical Yearbook – 2002, National Statistical Office of Mongolia, Ulaanbaatar, 2003
- 2 Health Indicators – 2002, Department for Health Statistics and Information, Directorate of Medical Services, UB, 2003
- 3 Human Development Report Mongolia 2003, NSO calculation for HDR, Ulaanbaatar, 2003
- 4 Health Sector – 2002, Ministry of Health Yearbook, Ulaanbaatar, 2003
- 5 Monthly Population Morbidity and Mortality Report, Department for Health Statistics and Information, Directorate of Medical Services, Ulaanbaatar, January 2004
- 6 Tuberculosis Cases 2002, data provided by Stop TB and Leprosy Unit, WHO Regional Office for the Western Pacific  
Tuberculosis Control in the WHO Western Pacific Region 2003 Report  
Malaria and Dengue cases and deaths, data provided by Malaria, Vectorborne and Parasitic Diseases Unit, WHO Regional Office for the Western Pacific, 10 March 2004  
Cholera and Japanese encephalitis cases and deaths, information taken from the website of Regional Electronic Surveillance System for Notifiable Diseases in Western Pacific Region (<http://internet/cds/cds-query.cfm>)
- 7 Ministry of Health August 2004
- 8 Human Development Report 2004 WHO: Geneva
- 9 Injuries in Mongolia 1998-2002 PHI/NTOH/MOH/WHO 2002
- 10 Global Water Supply and Sanitation Assessment WHO/Un children's Fund 2000 WHO : Geneva
- 11 Mongolia Environment Monitor 2002 World Bank : Mongolia
- 12 Ministry of Nature and Environment August 2004