

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

ULAANBAATAR CITY

MONGOLIA

***THE STUDY ON
SOLID WASTE MANAGEMENT PLAN
FOR ULAANBAATAR CITY
IN MONGOLIA***

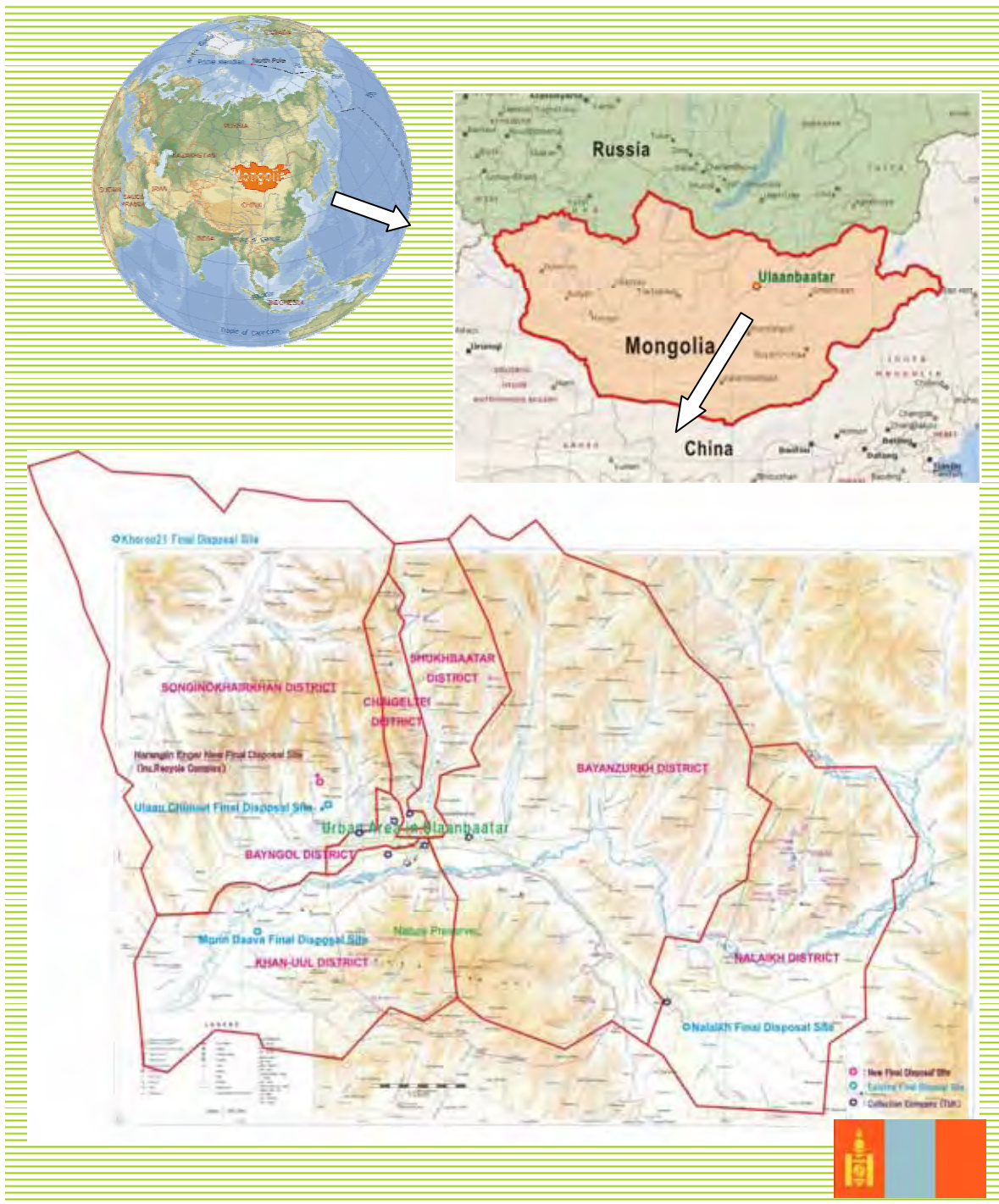
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Study Area
for the Study on Solid Waste Management for Ulaanbaatar City in Mongolia

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List of Abbreviations

ADB	Asian Development Bank
ATP	Ability To Pay
BGD	Bayangol District
BKhD	Bagakhangai District
BND	Baganuur District
BZD	Bayanzurkh District
ChD	Chingeltei District
CD	Capacity Development
CDPPD	City Development Policy Planning Division
CMPUD	City Maintenance and Public Utilities Division
CMPUA	City Maintenance and Public Utilities Agency
CPUDC	Construction and Public Utilities Development Center
C/P	Counterpart
CSIA	City Specialized Inspection Agency
CTP	Community thermal plant
DF/R	Draft Final Report
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
F/S	Feasibility Study
GOM	Government of Mongolia
HIW	Hazardous Industrial Waste
IC/R	Inception Report
IEE	Initial Environmental Examination
IT/R	Interim Report
JICA	Japan International Cooperation Agency
JICA ST	JICA Study team
JOCV	Japan Overseas Cooperation Volunteer
JV	Joint Venture
KhUD	Khan Uul District
KH21DS	Khoroo 21 Disposal Site in Songinokhairkhan
M/M	Minutes of Meeting
MDDS	Morin Davaa Disposal Site
MIC	Ministry of Industry and Commerce
MOCUD	Ministry of Construction and Urban Development
MOECS	Ministry of Education, Culture and Science
MOE	Ministry of Environment
MOF	Ministry of Finance
MOH	Ministry of Health
M/P	Master Plan
MSWM	Municipal Solid Waste Management
MUB	Municipality of Ulaanbaatar
NaD	Nalaikh District
NDS	Nalaikh Disposal Site
NEDS	Narangiin Enger Disposal Site
NERC	Narangiin Enger Recycling Complex
Non-HIW	Non-Hazardous Industrial Waste
NPV	Net Present Value
NSO	National Statistical Office
Nuuts	Reserve Company
O&M	Operation and Maintenance
OSNAAG	Ulaanbaatar Housing and Communal Services Company
POS	Public Opinion Survey
P/P	Pilot Project
PR	Public Relations
P/R	Progress Report

RDF	Refuse Derived Fuel
SBD	Sukhbaatar District
SKhD	Songinokhairkhan District
SSIA	State Specialized Inspection Agency
ST	Study Team
St/C	Steering Committee
S/W	Scope of Work
SWM	Solid Waste Management
TFT	Task Force Team
T&M	Time and Motion Survey
TUK	Renovation company which provides which provides waste collection, street sweeping, park cleaning, greening services
TWG	Technical Working Group
UB	Ulaanbaatar
UBCSIA	Ulaanbaatar City Specialized Inspection Agency
UCDS	Ulaan Chuluut Disposal Site
UNDP	United Nations Development Program
UNESCO	United Nations Science and Cultural Organization
USAG	Water Supply and Sewage System Company
USIP	Ulaanbaatar Service Improvement Project
WACS	Waste Amount and Composition Survey
WB	World Bank
WTP	Willingness to Pay

1. Profile of the Study Area

1 Profile of the Study Area

1.1 Natural Conditions

1.1.1 Country

a. Location

Mongolia, area of 1,566,500 km² is located in Northern Asia, with boundaries of 3,485 km with Russia and 4,673 km with China. The country does not have coastal lines. Average altitude of the land is 1,580 m above sea level.



Figure 1-1: Location of Mongolia

According to Population and Human Census 2000, there were 2,373,500 persons as residents of Mongolia, and the land per capita was 65 ha.

b. Climate

Mongolia has an extreme continental climate with long, cold winter and short summer, during which most precipitation falls. The country averages 257 cloudless days a year. Precipitation is highest in the north, which averages 20 to 35 cm per year, and lowest in the south, which receives 10 to 20 cm. The extreme south is the Gobi, some regions of which receive no precipitation at all in most years.

Average temperatures over most of the country are below freezing from November through March and are about freezing in April and October. January and February averages of -20°C are common, with winter nights of -40°C occurring most years. Summer extremes reach as high as 38°C in the southern Gobi region and 33°C in Ulaanbaatar. More than half the country is covered by permafrost, which makes construction, road building, and mining difficult. All rivers and freshwater lakes freeze over in the winter, and smaller streams commonly freeze to the bottom.

1.1.2 Ulaanbaatar City

Ulaanbaatar, the capital of Mongolia, is located in north-central Mongolia, approximately 675 km from the Chinese border at Erlian, and 290 km from the Russian border at Naushki. According to the country brief by Word Bank, its altitude and continental location make Ulaanbaatar the coldest capital city in the world.

According to Statistical Handbook of Ulaanbaatar City, the city presently covers an area of 4,704.4 km². Administratively, the city is divided into 9 districts (Duuregs). Each Duureg

consists of sub-divisions called Khoroos. There are 6 to 21 Khoroos in one duureg, and each Khoroos consists of group of smaller divisions called Kheseqs.

a. Climate

Ulaanbaatar has arid with continental climate conditions. The details of each meteorological parameter are described below.

The average annual rainfall of Ulaanbaatar City is 261.1 mm from 1999 to 2003. The rainfall from June to August, rainy season, shares 58% of the annual rainfall. The rainfall in the other months is less than 50 mm.

Table 1-1: Average Monthly Precipitation

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
(mm)	3.7	2.6	4.1	12.0	35.8	50.1	41.9	60.5	29.9	6.7	9.4	4.4	261.1

(Source) Institute of Hydro-Meteorology, 1999 to 2003

The average temperature in the city varies from the minimum of -21.0℃ in January to the maximum of 15.3℃ in August. The average annual temperature is calculated to be -0.3℃.

Table 1-2: Average Monthly Temperature

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(℃)	-21.0	-15.6	-5.4	1.5	9.5	14.5	16.9	15.3	7.8	0.9	-10.1	-17.7

(Source) Institute of Hydro-Meteorology, 1988 to 1997

The humidity is high in winter, but low in rainy season of summer. The annual average humidity is 69%.

Table 1-3: Average Monthly Humidity

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Aveg
(%)	81	78	67	54	50	59	68	70	68	69	78	83	69

(Source) Institute of Hydro-Meteorology, 1993 to 1994

The average data for wind direction and velocity are collected for Ulaanbaatar Station. Most of winds blow from north-west and east throughout a year, through northern wind is also prevailing from April to August. The wind velocity is generally stronger in winter season than summer season.

Table 1-4: Annual Mean Wind Direction Frequency and Velocity

	N	NE	E	SE	S	SW	W	NW	Calm
Annual Mean Wind Direction Frequency (%)	18.7	8.3	21.6	5.7	3.8	9.8	11.7	21.8	38.4
Annual Mean Wind Velocity (m/s)	5.3	3.6	4.0	3.3	3.6	3.7	4.2	4.6	-

(Source) Water Policy Institute, 1970 to 1992

The estimated data indicate that from November to February the evaporation becomes minimum as low as almost zero (0) %. The maximum evaporation period lasts in October.

Table 1-5: Evaporation Estimated by Water Policy Institute

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
(mm)	-0.8	1.8	21.7	75.5	95.5	86.3	87.5	96.1	89.8	41.2	3.3	0.5	598.0

(Source) The Study on Water Supply System in Ulaanbaatar and Surroundings, 1995

Major effects to Solid Waste Management which may be caused by this climate condition are;

- Special consideration is necessary for waste collection during months of freezing temperature, from November to March.
- Evaporation of 598.0 mm over precipitation of 261.1 mm in a year may cause little leachate problem on the disposal site.
- Average humidity of 69% may have an influence on water contents of wastes.
- Strong winds, or sand storm in spring season frequently cause wind-driven fire at residential areas near existing disposal site.

b. Topography

Ulaanbaatar City is a basin enclosed by uplands, situated at the foot of the Bogdo Khan Uul, which rises 914 m above the city. The city lies at 1,351 m above sea level in the valley of the Tuul River.

Tuul River flows from east to west from Nalaikh to Ulaanbaatar City in the study area. Total length of the river is 819 km with catchment area of 50,400 km².

c. Groundwater in Ulaanbaatar City¹

The water source for Ulaanbaatar City depends solely on groundwater. It is utilized the water from Tuul River flowing south of the city. The water sources belonging to Water Supply and Sewerage System Company (USAG) are located at four (4) places along the river. The ground water is extracted from pump equipped wells, and then stored in storage reservoir. Supply amount of all four (4) water sources is 165,304 m³/day, while design capacity is 227,000 m³/day. The water sources are outlined as follows;

Central Water Source:

- Central Water Source has one (1) storage reservoir, design capacity of 97,000 m³/day, with 70 wells around the area. Average depth of the wells is 33 m.
- The alluvium of the area consists of sand and gravel with clay. The alluvium is divided into two layers, upper and lower. The upper layer ranges around 10 m to 20 m thick and the lower layer ranges 10 to 30 m or thicker in place. The width of this alluvium ranges from 1 km in Gachuurt to 4 km in Songino.
- Permeability coefficients of the upper layer vary from 1.22×10^{-1} cm/s to 2.85×10^{-1} cm/s and average 1.79×10^{-1} cm/s. Permeability coefficients of the lower layer vary from 2.63×10^{-2} cm/s to 6.71×10^{-2} cm/s and average 4.48×10^{-2} cm/s.
- It is the current main water source in Ulaanbaatar City.
- As population grows and amount of water consumption increases, the groundwater is excessively taken these years.

Industrial Water Source:

- Industrial Water Source has one (1) storage reservoir, design capacity of 43,000 m³/day, with 16 wells around the area. Average depth of the wells is 33 m.
- Main water source to industrial factories.

Meat Complex Water Source:

- Meat Complex Water Source has one (1) storage reservoir, design capacity of 15,000 m³/day, with 8 wells around the area. Average depth of the wells is 31 m.
- Main water source to meat processing factories.
- The water quality is not suitable for drinking.

¹ Information from “The Study on Water Supply System in Ulaanbaatar and Surroundings, JICA”

Upper Water Source:

- Upper Water Source has one (1) storage reservoir, design capacity of 72,000 m³/day, with 39 wells around the area. Average depth of the wells is 32 m.
- The alluvium consists of gravel-pebble with boulder, sand and sandy clay. The thickness is from 20 to 64 m or more.
- Permeability coefficients vary from 1.34×10^{-2} cm/s to 1.61×10^{-1} cm/s and average 7.53×10^{-2} cm/s.
- Located about 40 km upstream of the city, along Tuul River.
- Considered supplemental water source to central water source.

After chlorination at above storage reservoirs, water flows into supply reservoirs and Community Heating Centers (CTC). There are four (4) supply reservoirs located on the northern hills in the city and one (1) reservoir located at east side of Ulaanbaatar City.

The supply reservoirs, made out of reinforced concrete, are constructed at the ground level and covered with earth of 1 m on the roof slab.

Distribution pipelines are laid underground with earth covering depth of 2.0 to 3.0 m in general. The pipeline networks had been designed to keep water pressure of 26 m on main corners of the streets in the city.

Location of intake wells is one of the major concerns for solid waste management. Site selection is perhaps the most difficult obstacle to overcome in the planning and development of landfill.

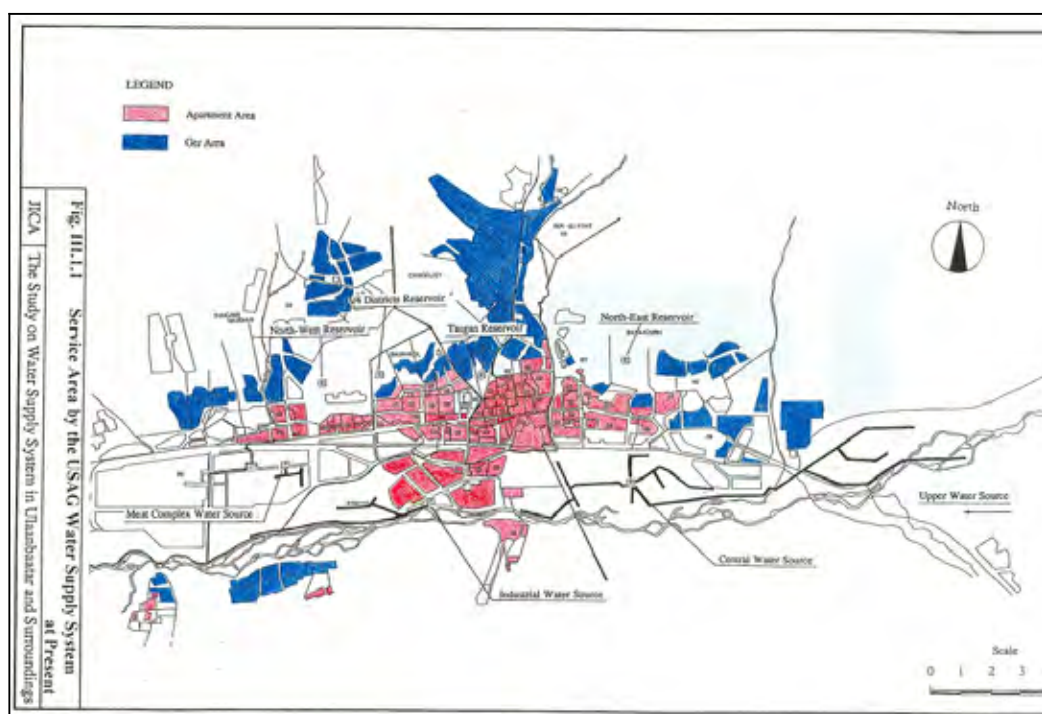


Figure 1-2: Locations of Water Sources²

² (Source): The Study on Water Supply System in Ulaanbaatar and Surroundings, JICA

1.1.3 Study Area

a. Location

There are nine (9) Duuregs in total in Ulaanbaatar City. Target area of the study is seven (7) Duuregs as described below.

- Songinokhairkhan Duureg (SKhD);
- Sukhbaatar Duureg (SBD);
- Bayangol Duureg (BGD);
- Khan-Uul Duureg (KhUD);
- Chingeltei Duureg (ChD);
- Bayanzurkh Duureg (BZD); and
- Nalaikh Duureg (NaD).



Figure 1-3: Study Area

1.2 Social Conditions

1.2.1 Administration

The figure below indicates the main entities involved in SWM in Ulaanbaatar and their relationships. They are described in more detail in Section 3.3.1 Administration and Organizations in Chapter 3.

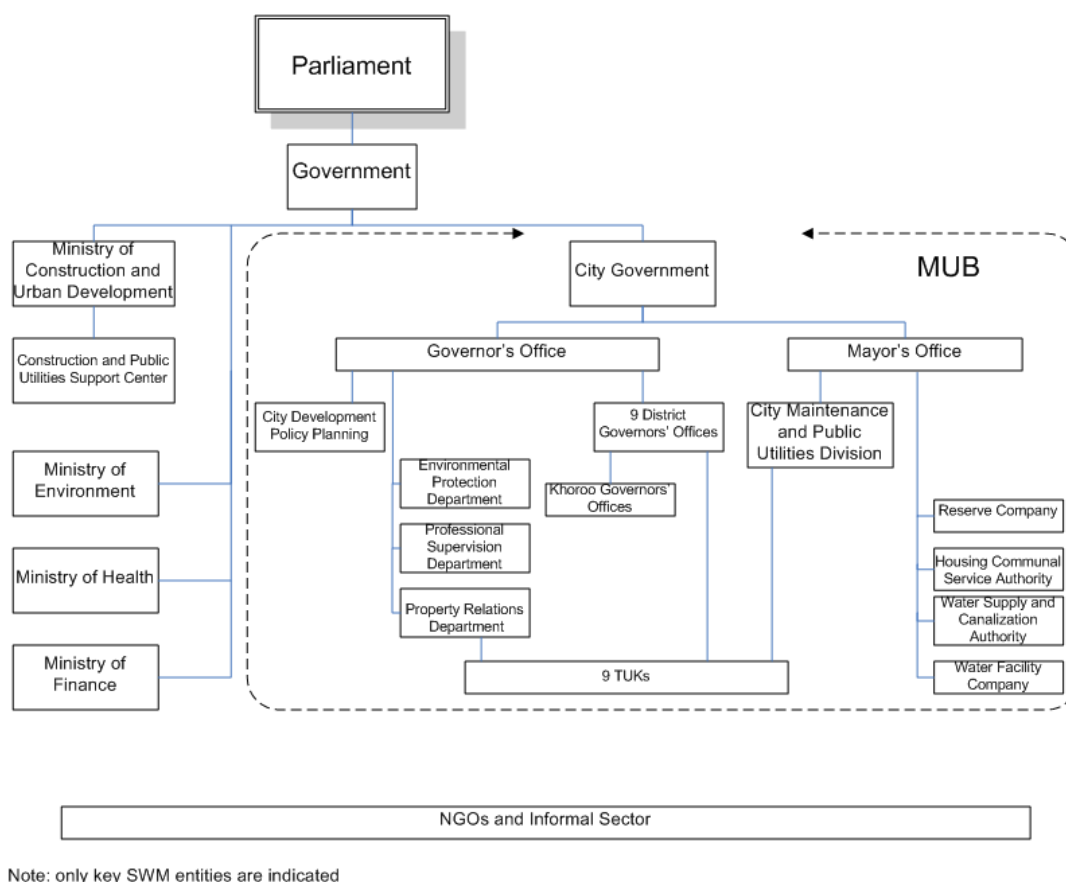


Figure 1.2.1

Principal Institutions Involved in SWM in UB

Figure 1-4: Principal Institutions Involved in SWM in UB

Parliament has the primary responsibility for developing State policy on waste management; and the Government's main responsibilities are to implement that policy and to adopt / approve methodologies for calculating waste fees and estimating waste production rates etc.

The main elements of the policy environment below Parliament and the Government are the:

- Ministry of Construction and Urban Development (MOCUD), responsible under the recent Government changes for advising Government on the policy framework for urban development, housing and public services, including SWM; and for ensuring implementation of State policy and national programs on waste management. The Ministry's Construction and Public Utilities Support Center has been newly charged by the new Government with national responsibility for implementing SWM policy, including setting national standards and improving management in the sector. However as yet it has not taken become heavily engaged in the sector.
- Ministry of Environment (MOE), responsible for assessing the environmental impacts of SW, and if appropriate closing a disposal site for example; maintaining statistical records on hazardous waste; and
- Ministry of Health (MOH), which has been very active in establishing the new legal context for improvements in public health and health care waste.

Mongolian legislation provides for three levels of Government in Ulaanbaatar – the City, 9 *Duuregs*, or Districts and 123 *Khoroos*, or sub-districts. Beneath this are *Khesegs*, which are informal groupings of small numbers of streets within *Khoroos*.

Appointment of the Governor of the Capital City is by nomination of the 40 Citizens Representatives of the City *Hural* or Parliament, subject to Prime Ministerial approval. The City's annual program of activities and budget must be approved by the City *Hural*. The two roles of Governor of the Capital City and Mayor of Ulaanbaatar are currently vested in the same person. The Governor also has direct responsibilities to the national Government Cabinet, which must authorize significant changes to the Municipal structure for example. The Mayor is charged with enforcing implementation of State policy on waste within the City; developing local plans for waste reduction; maintaining statistical records; approving rules, regulations and procedures for waste collection, transport and disposal; monitoring the implementation of waste legislation; appointing final disposal sites and selecting those to be in charge of their operation. SWM is frequently on the agenda of the City's fortnightly city management meetings at which District Governors report their activities and plan for the future.

City Government has recently been re-organized with several Divisions and Departments being renamed. Beneath the Mayor and Governor activities are divided between the Governor's Office, with predominantly policy and administrative functions, and the Mayor's Office, with predominantly implementation and operational roles. The Governor's Office has eight Divisions within it:

- Public Administration Management
- City Development Policy Planning
- Finance, Economy and Treasury
- Social Development
- International Relations & Cooperation
- Legal Affairs
- Military Affairs

and the Mayor's Office four:

- Engineering Facilities
- City Maintenance and Public Utilities
- Production and Services
- Tourism.

The City Development Policy Planning Division has principal responsibility within the City for SWM policy; and the City Maintenance and Public Utilities Division has principal responsibility for SWM operations.

Each Office also has a number of agencies, although in practice these may be responsible in different ways to Divisions in either Office. For SWM matters the most important agencies under the Governor's Office, and their primary SWM functions, are:

- Environmental Protection Department – nurturing the natural environment
- Professional Supervision Department – prime responsibility for legislative enforcement
- Property Relations Department – holding SWM assets

and under the Mayor's Office:

- “Reserve” Company – final disposal site operation. The Mongolian name Nuuts Company is also used in the report.
- Housing & Communal Service Authority - apartment SWM charges. The Mongolian acronym OSNAAG is also used in the report.

- “Water Facility” Company – SW cleaning of storm water drainage
- Water Supply and Canalization Authority – sewage treatment and disposal. The Mongolian acronym USUG is also used in the report.

There are nine District Governments within UB, seven of which are included in the Study, reporting principally to the Governor's Office. District Governors are appointed by the City Governor, with the legal maximum of 35 District staff being professional officers. They implement City policy but the District's annual program and budget must be approved by the District Citizens Representatives' *Hural*, which subsequently monitors performance.

District Governors are required to maintain their public areas in clean condition, to implement waste legislation, to work with an entity in charge of collecting and transporting waste and to provide funds for these operations. Each District has a TUK which undertakes SW collection and transport, as well as other activities. These report to the City Maintenance and Public Utilities Division and City Property Relations Department as well as to their respective District Departments and Governments. The Law also requires the maintenance of a District Waste Fee Information Database with information to be supplied by the *Khoroos*, but this has not yet been implemented.

Khoroo level government is regarded by the City as being very important to Municipal success, since it is the main interface with the public. It fulfills a very wide range of civic administration functions. *Khoroo* Governors are appointed by the District Governors. The *Khoroo* Public *Hural* is consultative only and does not have approval authority for *Khoroo* activities. The implementation function of the *Khoroo* is to realize decisions made at higher levels. Two or three social welfare staff whose salaries are paid for by the District, assist the Governor. The law requires Governors to monitor illegal dumping and organize appropriate cleaning measures such as campaigns and collections of money from *ger* area households to contract trucks to remove waste.

There is increasing concern about the quality and efficiency of *Khoroo* government. The populations of *Khoroos* vary greatly in size, from about 4,000 to 20,000, but have the same number of staff. Not all *Khoroos* have their own dedicated premises. They are overloaded with work to varying degrees with bombardment of instructions from above and demands from increasing populations below. The quality of the *Khoroo* Governors varies widely, depending on their personal energy and enthusiasm; and the low remuneration is a temptation to corruption.

The *Khesegs* are a post-communist response to increasing population fuelled by immigration to Ulaanbaatar's *ger* areas. *Kheseg* Leaders are appointed at public meetings called by the *Khoroo* Governor. These positions are voluntary and unpaid, and are usually filled by retired people. Their functions include publicizing decisions made at higher levels, encouraging participation in public meetings and learning about their local residents to the extent that they can advise on who should receive grant food aid, be exempt from SWM charges etc.

Some NGOs have SWM interests; and some informal agents in SWM perform significant SWM functions, particularly recycling, which may be more formalized at some time in the future.

1.2.2 Community Structure

There is an argument that Mongolia, with its nomadic tradition, has failed to develop concept of a village or a strong sense of community³. Most villages were created under the socialist system of state-organized collective agriculture, forestry and industry. Little social cohesion reportedly found in these settlements today.

³ Mongolia Forestry Sector Review, World Bank, April 2004

On the other hand, Ovoo⁴ rituals are said to have played an important role to maintain order and social network in community. Even at present, communities in nomadic areas have their own Ovoos, and strengthen the unit of the community through the Ovoo festival annually.

1.2.3 Public Education

a. Education System

The constitution of Mongolia states the free and compulsory primary education for all the Mongolian.

The Mongolian education system was developed based on the strong influence of the Soviet Union. As a result, its system consists of several components, which are different from the international K-12: (1) preschool and kindergarten; (2) four years of primary education, beginning at age eight; (3) four years of lower secondary education, with compulsory education ending after Grade 8; (4) two years of upper secondary education; (5) postsecondary and higher education; and (6) technical and vocational education and training (TVET). The Government is extending the country's education system from a 10-year program to a 11 year system in 2006 and to a 12-year system in 2008, in line with international standards.

The Ministry of Education, Culture and Science (MOECS) is the central administrating body that formulates national educational policy and sets the standards for each level of formal education. In addition, the Ministry is in charge of preparation and publication of textbooks and state examination procedure.

b. Current Conditions of the Mongolian Education

During the Soviet era, the Mongolian education achieved important goals with the assistance from the Soviet Union: free basic education for all and the overall literacy rate of 96%.

However, the economic crisis in Mongolia has had adverse effects on education. Net primary enrolment rates plummeted from around 98.0 per cent in 1989 to 82.0 per cent in 1992. Main reason of this decline was the boys who were from herder families living in the remote Aimags and who dropped out of the schools to help their parents to look after the privatized livestock.

From 2000, the downward trend stopped and the overall trend of enrolment rate rebounded, as shown in Table 1-6. However, the rebound of the enrolment rate in other rural areas is slow and the rate remains significantly low compared to Ulaanbaatar.

Table 1-6: Enrollment Rate 1999-2002 in Ulaanbaatar

Year	Combined primary, secondary, and tertiary enrolment rate
1999	75.7%
2000	73.8%
2001	73.8%
2002	82.2%

(Source): Human Development Report Mongolia 2003

Even though basic education remains free, the cost of school supply, meal, and informal levies for repairs and maintenance became a significant burden for low income households.

On the all the levels, female students outnumber male ones. According to Human Development Report, the combined enrolment rate of female students all over Mongolia in

⁴ Ovoo is usually erected on a mountain-top as a shamanistic traditional offering to the local gods or deities. Ovoo is sacred and all digging, hunting and logging nearby is strictly prohibited.

2002 was 73.3%, while that of male students was 66.3%.

At present, the education system in Mongolia faces various problems, as summarized below.

- There are big differences in enrolment rate among regions
- The actual education cost is high for low-income households
- Curriculum does not meet the need from the society
- The system, in particular higher level, is highly specialized and compartmentalized
- Education facilities such as school buildings and dormitories are very old and need to be improved.

c. Education Reform

In 2002, the Parliament of Mongolia reviewed and adopted new Package of Law on Education, which includes the Primary and Secondary Education Law, the Technical and Vocational Education Law, the Higher Education Law and the Government policy for education. The Mongolian government took a sector-wide approach in order to reform the education system in cooperation with various organizations such as UNESCO, UNDP, ADB, and JICA. The main contents of the reform are:

- to convert the education system from 10 year schooling to 11 year schooling
- to improve the curriculum and quality of teaching
- to improve the education facilities
- to develop non-formal and distance education
- to provide environmental and public health education

1.2.4 Public Health

a. Public Health System

Same as in the education sector, the public health system was developed with the assistance from the Soviet Union and followed its model.

During the Soviet era, there were impressive achievements such as free access to health service. However, since service delivery, human resources, infrastructure, equipment and consumables were centrally planned and implemented, the cost efficiency was low. There was excess supply of health service in Ulaanbaatar. In addition, the quality of service and individual choices were not regarded as importance.

Health care has undergone massive changes since the transition. In particular, health spending is estimated to have declined by 50% from 1990 to 1996, a user pays system and health insurance had been introduced and the management of health services has been decentralized. Private health services have been allowed to operate since 1991 and by 1998 there were 828 private enterprises, mostly concentrated in Ulaanbaatar.

The Ministry of Health (MOH) is responsible for the delivery of most health services. In 1998, the Ministry issued Order # 361 which defined 'The Approved Levels of Health Care'. The order defined the 4 levels of health care.

Table 1-7: Approved Levels of Health Care

Level	Type of Health Care	Description
Primary Health Care	Feldsher Health Services	Primary health care and health education provided to the population at the feldsher level by Government and Non-Government Organisations.
Secondary Health Care	General Practitioner Health Services	Primary health care and health education provided by general practitioners
Tertiary Health Care	Hospital Health Services	Public health and hospital health services provided to the populations of aimags and soums
Fourth Level of Health Care	Specialised Health Services	Specialised health services provided by State Clinical hospitals, specialised hospitals, and centres which have highly qualified professional staff, modern equipment and facilities.

With the shift to a preventative policy, the health care system is gradually moving from hospital-based services to family medical practices and outpatient clinics. MOH emphasizes the importance of the prevented measures by primary and secondary health care. There is, however, some resistance to the new policy amongst the public as there is a perception that better quality service is offered in hospitals. In Ulaanbaatar, due to the excess supply of health service, some hospitals were closed or merged.

The MOH administers 19 specialized hospitals, 21 aimag hospitals, 327 soum and inter-soum hospitals and 937 bagh feldsher posts.

Ulaanbaatar's Health Department is divided into six Consultation Health Centers and sixteen Health Centers. Each Health Center is staffed with family doctors and has a family planning cabinet (clinic). Each family doctor is responsible for 200 – 250 families or 1,000 – 1,200 people.

Each Aimag has a Public Health Center and a hospital which serves a population of 43,000 – 107,000. Aimag hospitals have 120 to more than 400 beds, depending on the area's population. They provide specialist care including Obstetrics/Gynaecology, Surgery, and Dental Care. Each Aimag public health center has a family planning cabinet (clinic) and an STD cabinet. Soum Hospitals serve a population of 3,000 – 5,000. They have 10 – 15 beds and are staffed by 2 - 3 doctors. They provide limited inpatient services. Each Soum hospital has a Gynaecology cabinet which provides family planning and some STD services to women only.

b. Current Status

Under-five mortality rate has been reduced rapidly. It dropped from 87.5 (per 1000 live births) in 1990 to 42.4 in 2000. One of the main factors for this decline is attributed to the sharp drop in birth rate, from 36.5 in 1989 to 20.6 in 2002. The life expectancy rose to 63.5 in 2002 after it fell to 62.8 in 1992.

Maternal mortality rate in Mongolia is still high, 158 (per 100,000 live births) in 2000, even though it declined from 200 in 1990. In addition, maternal mortality rate in remote rural areas, in particular in west aimags, is much higher than the national average.

There is a big discrepancy in accessibility to quality health service among regions, and maternal mortality in rural areas, in particular in the west, has not shown much improvement.

Tuberculosis is one of the urgent public health problems in Mongolia. The registered incidents of tuberculosis had increased from 79 in 1990 to 125 in 2001 and 155 in 2003 per 100,000. Most of the people with tuberculosis are unemployed and poor people. The spread of the disease was strongly connected with the spread of poverty during the transition period.

1.2.5 Customs, Language and Religion

a. Customs

The Mongolian culture is closely connected with the lifestyle. From ancient times on, Mongolians have lived in the vast lands of Central Asia raising livestock. This nomadic lifestyle is reflected in the Mongolians' everyday thinking and culture. One of the unique features of the nomadic culture is that people live in full harmony with Mother Nature.

There are two major events. One is Tsagaan Sar (the white month), the first month of spring, and the Mongolian has celebrated it for centuries. This is a time of the year when winter passes away and spring comes in.

Tsagaan Sar is a celebration of New Year, addition of age and safe ending of winter for animals. Tsagaan Sar is a festival of white food (food with white color – milk and dairy products, rice, etc.) Tsagaan Sar represents a heartfelt spirit of people. On this day, people clean their body and mind from all bad things and start a new fresh clean life. Tsagaan Sar is the day when people express respect to elder people and relatives, renew friendship and sympathy to each other and reconfirm family ties. Family and relatives gather together.

The other is Naadam, the Mongolian traditional summer festival. The full name of the festival is Eriin Gurvan Naadam translated as the Three Men's Games. The word "Naadam" comes from the word "Naadam" which means "to play".

b. Language

Mongolians account for over 90 per cent of the population. There are 20 ethnic Mongolian groups, and many people of mixed ethnic origin. Some ethnic groups can be distinguished by their dialects. Khalkh Mongols make up the largest group. The non-Mongolian population consists of Kazakhs, Tungusic speakers, Russians, and Chinese.

Khalkha Mongolian, the official language, is a member of the Ural-Altaic family of languages, which includes Finnish, Turkish, Kazak, Uzbek and Korean.

Since 1944, the Russian Cyrillic alphabet has been used in written Mongolian. The country produced a huge literature, almost none of which is known to European language speakers.

Although Russian is the predominant second language in Mongolia, there is now little demand for learning it. There is an increasing demand for Japanese and English, reflecting the broadening of the country's international relations.

c. Religion

Mongolia is predominantly a Buddhist country since Tibetan Buddhism (also called Vajrayana Buddhism) was introduced in the 16th century. Prior to the spread of Buddhism, the religion of Mongolia could be classified as shamanism. Buddhism did not completely overtake shamanism. In becoming a Buddhist state, Mongolia's shamanic traditions did not simply vanish. Aspects of shamanic religious tradition were instead incorporated into the Buddhism that became dominant in Mongolia.

There's a significant minority of Sunni Muslims in the far western regions of Mongolia, most of who are ethnic Kazaks.

1.2.6 Employment and Income

According to the Urban Poverty and In-Migration Survey Report⁵, UNDP Mongolia, 2004, 56 percent of the population aged 15 years and above in Ulaanbaatar are economically active

⁵ 2,166 residents (1,152 ger residents and 1,014 apartment residents) were interviewed in the UNDP survey.

population or the labor force. Men exceed women in the labor force participation rate since many women are engaged in housework or studies. There is no significant difference between men and women in terms of the unemployment rate, i.e. approximately 23 percent. On the other hand, there is a striking difference in the unemployment rate between ger and apartment residents; the unemployment rate in ger areas is 16 points higher than that in apartment areas. The following table shows the percentage distribution of the employment status of the respondents interviewed in the Survey.

Table 1-8: Percentage Distribution of Employment Status

Respondents	Labor Force Indicators		
	Labor Force Participation Rate	Employment Rate (Employed/Working Age Population)	Unemployment Rate (Unemployed/Economically Active Population)
Sex			
Male	62.4%	48.3%	22.5%
Female	49.9%	38.3%	23.2%
Location			
Ger Area	56.1%	39.5%	29.5%
Apartment Area	54.9%	47.5%	13.6%
Total	55.6%	42.4%	22.9%

(Source): Survey Report, Urban Poverty and In-Migration, UNDP Mongolia, 2004

There is also a difference in the characteristic of the working sector (formal or informal) between ger and apartment residents. The ratio of ger residents working in the informal sector is higher than that of apartment residents, as the following table shows.

Table 1-9: Percentage Distribution of Employment Status

Residing areas	Working Sector		
	Formal	Informal	Abroad
Ger Area	63.1%	35.7%	1.2%
Apartment Area	73.3%	24.0%	2.7%
Total / Average	67.9%	30.2%	1.9%

(Source): Survey Report, Urban Poverty and In-Migration, UNDP Mongolia, 2004

The differences of employment status and the characteristic of the working sector mostly explain the disparity in the household income between ger and apartment residents. The average monthly household income of ger residents (171,000 MNT) is approximately two-thirds of that of apartment residents (265,000 MNT).

1.3 Population

Population of the study area with total population of Ulaanbaatar City in 2003 is shown in the table below. According to Ulaanbaatar City Development plan, approximately 40% of the population of Mongolia or 869,912 people are dwelling in the Ulaanbaatar City as of the end of 2003. Average number of family members in a household is 4.52 persons in the study area.

Table 1-10: Duureg Information (Year 2003)

Duureg	Area (ha)	Household	Population	Population Density (Person/ha)
SKhD	120,063	38,572	182,153	1.5
SBD	20,840	23,522	106,167	5.1
BGD	2,949	34,124	153,562	52.1
KhUD	48,466	17,289	81,140	1.7
ChD	8,930	27,218	122,483	13.7

BZD	124,412	40,106	172,824	1.4
NaD	68,764	5,475	24,687	0.4
STUDY AREA	394,424	186,306	843,016	2.1
BND	62,020	5,881	23,249	0.4
BKhD	14,000	747	3,647	0.3
MUB	470,444	192,934	869,912	1.8

(Source): Statistical Handbook of Ulaanbaatar City

The density of the population in the Study Area is counted as 2.1 per hectare territory.

According to Donor's Thematic Group Meeting on Ulaanbaatar City Development report (2003), ger area is greater in density. The report dictated that territory of ger area is 4,100 ha., in the city, and total of 85,000 households or about 360,000 people reside in the area. However, migration to the city occurs on daily basis, without the numbers recorded by officials, the actual figure of density in ger areas is uncertain.

1.3.1 Trend of Population

Ulaanbaatar City population grew by 44.7%, from 543,600 in 1990 to 786,500 in 2000. The increase of the permanent population of Ulaanbaatar City during the last years is directly related to the number of the people moving to the Ulaanbaatar City from the countryside besides natural increase.

As regarding of Population Census 2000, 64 % had moved into Ulaanbaatar City from 1995 to 2000, refer to Table 1-11. Thus the great migration towards the city was clear. Apart from the capital, all regions showed net out-migration. The largest net outflow was from the West that continued to lose population to other regions.

Table 1-11: Migration by region in Mongolia

Region	In-Migrants	Out-Migrants	Net Migration
Central	36,709	47,258	-10,549
East	4,629	15,923	-11,294
West	5,212	47,141	-41,929
South	7,089	11,851	-4,762
Ulaanbaatar	95,435	20,078	+75,357
Abroad	-	6,823	-6,823
Total	149,074	149,074	0

(Source): Population Census 2000

Population Growth Rates by 10 years in Ulaanbaatar City are shown in the Table below.

Table 1-12: Annual Average Growth Rate, by 10 years⁶

Year	Total (%)
1930 - 1940	2.1
1940 - 1950	14.8
1950 - 1960	9.6
1960 - 1970	6.8
1970 - 1980	3.9
1980 - 1990	2.8
1990 - 2000	3.1
2000 - 2003	3.6

(Source): Statistical Handbook of Ulaanbaatar City

1.3.2 Population by Duuregs and Khoroo

Population, area, and density by each Khoroo and Duureg are described in the Table below.

BGD is the most populated Duureg among all in the study area; its density is 52 persons per hectare, which is 130 times larger than NaD, the least populated area.

Table 1-13: Population and Area by Duuregs and Khoros

DUUREG	NO	POPULATION (person)	AREA (hectar)	DENSITY (person/hectar)	Source	DUUREG	NO	POPULATION (person)	AREA (hectar)	DENSITY (person/hectar)	Source
SK h D	1	12,785	3,199.0	4.0	A	KhUD	1	7,605	268	28.4	A
	2	4,649	1,231.0	3.8	A		2	7,630	225	33.9	A
	3	9,389	1,804.0	5.2	A		3	6,795	623	10.9	A
	4	8,160	2,226.0	3.7	A		4	5,803	346	16.8	A
	5	9,629	947.0	10.2	A		5	5,709	108	52.9	A
	6	13,100	1,401.0	9.4	A		6	6,655	76	87.6	A
	7	11,179	1,292.0	8.7	A		7	5,023	104	48.3	A
	8	6,964	987.0	7.1	A		8	7,541	211	35.7	A
	9	11,815	1,708.0	6.9	A		9	10,251	546	18.8	A
	10	10,201	1,320.0	7.7	A		10	4,990	5,085	1.0	A
	11	12,522	685.0	18.3	A		11	4,030	204	19.8	A
	12	33,824	1,133.0	29.9	B		12	4,719	10,740	1.0	A
	13						2,778	8,104	1.0	A	
	14						1,611	7,105	1.0	A	
	15						Natural Protected Area		14,721	0.0	A
	16						Total		8,1140	48,466	1.7
	17					7,204	196.0	36.8	A	CHD	1
	18	9,237	1,328.0	7.0	A	2					
	19	9,527	369.0	25.8	A	3					
	20	7,876	4,348.0	1.8	A	4					
	21	4,062	95,886.0	1.0	A	5					
Total		182,153	120,060.0	1.5	6						
SBD	1	3,329	172.1	19.3	A	7	8,900	144.8	61.5		A
	2	5,262	34.8	151.2	A	8	5,588	385.0	14.5		A
	3	5,419	17.4	311.4	A	9	6,666	613.0	10.9		A
	4	3,786	14.8	255.8	A	10	6,404	785.0	8.2		A
	5	4,744	34.6	137.1	A	11	6,300	554.0	11.4	A	
	6	4,624	46.7	99.0	A	12	9,167	1,929.0	4.8	A	
	7	7,054	38.2	184.7	A	13	7,314	917.0	8.0	A	
	8	9,037	72.7	124.3	A	14	7,136	806.0	8.9	A	
	9	9,360	73.5	127.3	A	15	8,065	103.8	77.7	A	
	10	7,429	95.5	77.8	A	16	8,645	302.4	28.6	A	
	11	9,658	22.2	435.0	A	17	8,400	514.5	16.3	A	
	12	5,910	77.3	76.5	A	18	11,882	497.9	23.9	A	
	13	6,458	133.4	48.4	A	Total		122,483	8,930.0	13.7	
	14	5,167	96.9	53.3	A	BZD	1	5,765	1,560.8	3.7	C
	15	9,672	9,950.9	1.0	A		2	22,963	25,441.6	1.0	C
	16	9,258	9,946.1	1.0	A		3	4,909	829.6	5.9	C
Total		106,167	20,827.1	5.1			4	9,250	3,558	2.6	C
BGD	1	8,561	99.4	86.1	A		5	11,684	12,809.9	1.0	C
	2	5,437	72.0	75.5	A		6	7,801	3,537.5	2.2	C
	3	8,872	132.6	66.9	A		7	8,024	339.5	23.6	C
	4	10,596	140.0	75.7	A		8	9,746	7,796.0	1.3	C
	5	7,390	48.4	152.7	A		9	8,297	8,181.7	1.0	C
	6	9,047	110.7	81.7	A		10	10,860	13,099.2	1.0	C
	7	7,913	43.8	180.7	A		11	3,459	998.4	3.5	C
	8	7,447	44.4	167.7	A		12	8,957	9,499.5	1.0	C
	9	10,469	247.2	42.4	A	13	7,462	5,899.8	1.3	C	
	10	9,714	273.2	35.6	A	14	6,657	6,317.6	1.1	C	
	11	9,807	310.2	31.6	A	15	5,253	278.4	18.9	C	
	12	10,649	20.7	514.5	A	16	11,401	2,942.9	3.9	C	
	13	6,125	22.5	272.2	A	17	8,260	8,149.6	1.0	C	
	14	5,902	18.3	322.5	A	18	7,924	657.7	12.0	C	
	15	5,735	19.4	295.6	A	19	8,954	11,395.7	1.0	C	
	16	5,853	29.0	201.8	A	20	5,198	1,146.2	4.5	C	
	17	5,581	46.0	121.3	A	Total		172,824	124,411.0	1.4	
	18	8,568	32.7	262.0	A	NaD	1	5,807	5,700.0	1.0	A
	19	7,112	22.5	316.1	A		2	6,820	464.0	14.7	A
	20	2,784	1,216.0	2.3	A		3	4,120	11,400.0	1.0	A
Total		153,562	2,949.0	52.1			4	4,453	14,800.0	1.0	A
							5	2,500	16,800.0	1.0	A
							6	987	19,600.0	1.0	A
						Total		24,687	68,764.0	0.4	

All the population data was taken from Statistical Handbook.

Population Densities less than one (1) are described as 1.0.

A: Khoroo areas were provided by the Duureg Office.

B: Khoroo areas were calculated / adjusted.

C: Duureg Office did not have Khoroo area but only residential areas and its percentage of total area. So the Khoroo areas were calculated and adjusted.

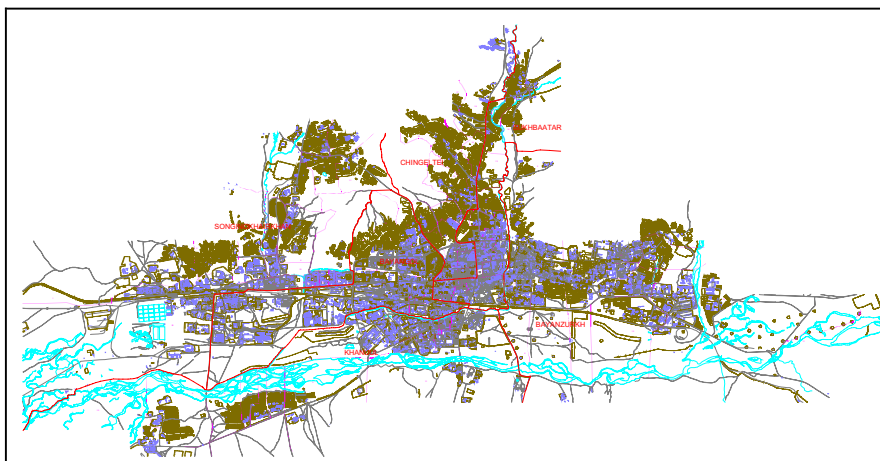


Figure 1-5: Location of Six (6) Duuregs in Urban Area

1.4 Urban Structure

1.4.1 General Situation

In terms of residential type, Ulaanbaatar City is divided into two areas; such as Apartment Area (planned area) and Ger Area (unplanned area). The planned area is established according to the city development plan while the unplanned area is inhabited by rapid migration from the country without any state control or permission. Unplanned areas are located on the slope of hills, mainly north of the city, causing serious effects on the environment, such as land slide, flooding, and air pollution by burning coals.

In this report, the words “Planned area” for Apartment area and “Unplanned area” for Ger area are used to distinguish the residential type. Difference of planned area and unplanned area are significant in various matters, such as availability of basic infrastructure.

Condition of infrastructures reflects largely on planning and operations of solid waste management; such as heat supply, road networks and water supply/sewage systems.

At present, 48% of Ulaanbaatar population resides in unplanned area, where the utility service is not complete. 69,951 of households or 93.3% in unplanned area have electricity supply, while 63,860 of households or 100% in planned area have electricity⁷. In Unplanned area, 4.4% have telephone, and all of them are heated by ordinary heating stoves, 80% are supplied water from water kiosks and 20% from open spring water. And over 70% have no centralized waste water removal system⁸.

As for the Solid Waste Management, planned area and unplanned area areas vary remarkably on the systems of waste storage, discharge, collections, as well as fee collection system.

a. Heat Supply

There are three sources of heating in Ulaanbaatar; centralized heating supply, heating boilers and ordinary stove heating. 80% of total heat supply is provided by central heat supply, 7% by boilers, and 13% by ordinary stoves. Annual average coal consumption by power plant is 3.3 million tons. Ordinary household stoves, utilized in unplanned area, burn 300 to 400 thousand tons of coal. Each household in unplanned area consumes coal of 4 to 6 ton, or 3 to 4 m³ of woods for cooking and heating in winter. The amount of coal ash wastes is significant in Ulaanbaatar City, and some are dumped illegally. Smoke from coal burnings is one of the

⁷ Interview with Ulaanbaatar City Electricity Distribution Network, 2005

⁸ Population and Housing Census 2000

major causes of air pollution in Ulaanbaatar City⁹.

b. Water Supply

According to USAG, over 155,000 m³/day of water is supplied, by USAG, to the households in planned areas and water kiosks in unplanned areas.

Percentage of the piped water consumer by categories; planned area is 79%, state organization is 7.6%, private organization is 7.3%, factories is 4.5%, and households in unplanned area is 0.8% in 2000.

In planned areas, the water consumption per resident is 315.6 liter/day, which includes the Unaccounted for Water of 26.4%. Water charge in planned area is 345Tg/ m³ including the charge for waste water treatment. The fees are paid through Ulaanbaatar Housing and Communal Services Authority (OSNAAG).

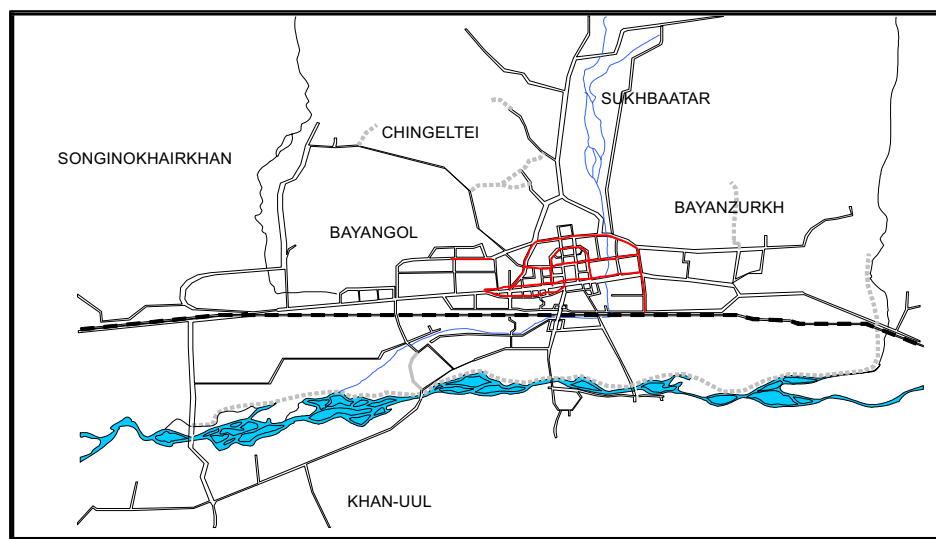
Most unplanned area residents obtain water from water kiosks. There are 412 water kiosks in total, where 149 of them are connected to central water systems. 263 water kiosks receive water from truck deliveries which have capacity of 5 ton. There are 45 water trucks in operation.

According to USAG, one liter of water is produced at a cost of 1.7 Tg but is sold for 0.5 Tg in Unplanned areas. One kiosk serves 1,500m³/day in average. The water consumption per resident in the unplanned areas is about 6.0litter/day¹⁰.

c. Road Condition

The Ulaanbaatar City road network consists of 439.1 km length road in total, of which 54.45 km is the national road, 202.65 km is the city road, 104.0 km is the duureg road, 78.0 km is the regional road, and 67.3 km is the residential road, and 35.5 km is unpaved. The main road has 7 to 24 m width and has 1 to 3 lanes with 2 to 6 rows. Number of registered vehicles by the Traffic Police Department of Ulaanbaatar City is 59,000, as of 2004¹¹.

Rapid increase of vehicles is causing traffic congestions at several roads and intersections, as well as serious air pollutions in Ulaanbaatar City. 100% of the roads in unplanned areas are unpaved. Figure 1-6 shows roads with frequent traffic congestion in Ulaanbaatar City.



LEGEND: Road with Traffic Congestions

Figure 1-6: Traffic Congestions in Ulaanbaatar City

⁹ Donor's Thematic Group Meeting on Ulaanbaatar City Development, 2003

¹⁰ Interview with USAG, 2005

¹¹ interview with Road Agency of the Capital City Governor, 2005

In planning of waste collection, existing road conditions, rehabilitation plan, and traffic condition are some of the major concerns.

1.4.2 Current Land Use

Table 1-14 shows the current land use in Ulaanbaatar City. Each category of the areas are scattered over the city and Duuregs, and their location can not be specified over the city map.

Table 1-14: Land Classification of Ulaanbaatar in 2003

	Area (ha.)	Ratio (%)
Agricultural Land	279,922	60.0
Cities, Villages and other Settlements	27,777	6.0
Transportation and Network Land	5,652	1.0
Forest Resources Land	76,294	16.0
Water Resources Land	4,143	1.0
State Special Use Land	76,656	16.0
Total	470,444	100.0

(Source): Statistical Handbook of UBC

Note:

- Area of cities, villages and other settlement includes streets and roads within the residential areas, land for waste water treatment, cemeteries, factories and disposal sites. The disposal sites are located in SKhD (20 ha.), and KhUD (8 ha.).
- Area of transportation and network road includes railways and parking spaces, power plant facilities, water supply facilities and flood controls.
- Area of state special use land includes natural protected areas, defense and security stations, and land owned by foreign institutions.

1.4.3 City Development Plan

Since 1998 the Mayor's Office and City Design (Development) Institute had been developing a feasibility study for long-term Master Plan of Ulaanbaatar up to 2020. Actual development of the Master Plan was completed in 2001 and endorsed by Government of Mongolia in February 2002. The Master Plan fully covers all aspects for development toward 2020.

a. Target Year and Population:

Target Year: 2020, Milestone Year: 2010

Target Population: 1,150,000

b. Concept:

- The city to be a well-developed capital city of international level; to have a vibrant economy; to be a world-class business center having a competitive position in the areas of education, information, science and technology.
- The city to have an appropriate policy for land management and urban development, including developing the Ger Area with appropriate infrastructure, and for improving housing conditions of all citizens.
- The city to be healthy, to have a safe environment, a well-knit social life and a progressive legal framework.
- The city to have a responsive and efficient public administration, having a participatory approach involving the community and the private business sector in civil services.
- The city to be an attractive tourist destination in the Asian Region.

c. Target for Infrastructure Development Plan from 2000:

Table 1-15: Development of Target Infrastructure

	Unit	2000	2020
Population in Planned Area	%	46.7	82.0
Area in Planned Area	m ²		8,485,200
Main Road	km	154.7	287
Sectional Road		168.8	249.8
Regional Heat Supply	%		79
Water Consumption Amount	m ³ /day	148,000	313,000
Green Space Area	m ² /person	3.45	30.0

d. Strategy for Unplanned Areas:

Unplanned areas will be improved from the areas where there are central infrastructure facilities nearby, particularly, the areas inner side of the belt highways will be undertaken for the development. The areas outer sides of the belt highway will be developed as individual housing areas.

According to the Master Plan, followings are planned developed as residential areas with full utility services;

- By 2005, Zone 15, apartment buildings in Zone 17 (new zone), Gandan Zone, individual housing areas in ChD,
- By 2010, individual housing areas in Uliastai Zone,
- By 2015, individual housing areas in Tolgoit Zone, apartment buildings in Yarmag Zone,
- By 2020, individual housing areas in Bayankhoshuu Zone, Dambadarjaa Zone.

Current city layout will be readjusted into four (4) regions as follows;

Table 1-16: Planned City Regions Towards 2020

New City	The new city is planned at Takhilt River and Bayangol basin, which is situated on the west side of Songinokhairkhan Mountain and flows into Tuul River.
Western Region	Factories and plants, causing pollutions to air, water, and soil in this region will be removed. And the area will be served as a new residential area.
Central Region	The area, located at Selbe, Khailaast, and Chingeltei river basins will be developed as a public spaces such as sport complex facility with gardens and parks.
Eastern Region	This area will be developed as more intensive area by constructing apartment buildings, public services and business complex.

The plan includes road rehabilitation, which connect all planned regions. JICA has conducted the Master Plan Study on improvement and rehabilitation of road network in Ulaanbaatar City in 1999. In this report, detailed road rehabilitation plan is proposed, and the improvement of road networks in the Master Plan was created based on the JICA study.

Table 1-17: Population in Each Region

	2005	2010	2020
Ulaanbaatar City	775,000	900,000	1,150,000
Central Region	444,600	491,200	538,800
Eastern Region	123,900	144,600	210,300
Western Region	196,700	254,400	384,400
New Region	9,800	9,800	16,500

Projected city population in each region is shown in Table 1-17. The Master Plan was created based on above figures.

1.5 Economic Conditions

1.5.1 National Economy

Along with the withdrawal of assistance of former Soviet Union, Mongolia started its transformation from a centrally planned economy to a market-oriented economy in the early 1990s. After the decrease in GDP by more than 20 percent during 1990-1992, the Government has successfully introduced numerous reforms, by which the country has achieved macroeconomic stability. Among others, the Government undertook structural reforms to encourage private sector-led growth. A bank restructuring and reform program has been implemented, public administration is being streamlined, the privatization program has been accelerated, tax reforms are being implemented, and the trade regime is among the most liberal in the world.

The GDP growth rate, which declined 9.5 percent in 1992, turned positive to 2.3 percent in 1994 and has remained positive since then. After a sharp fall in production in the first half of 1990s due to the lost linkages with former communist countries, the industrial sector including the mining sector has revived, currently accounting for 25% of the GDP. On the other hand, the agriculture sector, which is the major employment source of the country, failed to realize its growth potential due to harsh winters and springs in 1999-2002. The total herd of 34 million heads of livestock in 1999 reduced to 26 million in 2001, which brought about further migration of rural population to Ulaanbaatar that had been taking place since the early 1990s.

Inflation has declined from 66 percent in 1994 to the single-digit level by the end of 2002. Bank lending rates remain 2.5 to 3 percent per month; bank loans are mostly used to finance short-term trading but are not able to support the country's production, services and economic growth. A sharp decline in corporate tax revenues and dividends due to deterioration in terms of trade, along with the banking sector crisis where the Government is obliged to cover losses of some of the 12 banks that have gone bankrupt, lead to an increase of budget deficit to over 10 percent of GDP in 1998-1999. However, owing to the Government efforts, the overall budget deficit¹² declined to 6.0 percent of GDP with current budget surplus of 4.4 percent of GDP.

Table 1-18: Main Economic Indicators, 1995-2003

	1995	2000	2001	2002	2003*
Economic Growth, percent	6.3	1.1	1.0	3.0	5.5
Inflation Rate, percent	53.1	8.1	8.0	1.6	4.7
Overall Fiscal Balance, in percent of GDP	-5.2	-7.7	-4.1	-5.8	-5.9
Current Fiscal Balance, in percent of GDP	6.2	3.1	5.0	4.5	5.9
Exports in million US dollars	473	536	522	524	616
Imports in million US dollars	415	614	638	691	801
Exchange Rate, 1 US\$=MNT	473	1,077	1,097	1,110	1,147

(Source): Statistical Yearbook, NSO, 2004

(Note): *Preliminary

1.5.2 Regional Economy

Ulaanbaatar City has continued to play a leading role in the political and economic life of Mongolia. Since 1978 when the expanded thermal power station No. 3 and power station No.4 were put into operation, which improved electricity and heat supply for the city, investment increased approximately six times against the previous decade and the housing

¹² Overall budget deficit is current and capital revenue and grants, less total expenditure and lending minus repayment. Current balance is calculated as the difference between current revenue and current expenditure.

stock rose 2.3 times, thus enabling a half of 520 thousand population to live in housing with complete engineering facilities. By 1986, the Ulaanbaatar City had 9 Duuregs, 115 horoos, 148 thousand households, 735 thousand of population and nearly 21 thousand business entities.

The transition of the economy and society of Mongolia to a market-oriented system has expanded potentials of generating income and profit in the production and service sectors in Ulaanbaatar City, with relatively reliable and low cost infrastructure and engineering facilities compared to other regions. As a result, the population migration to Ulaanbaatar City has intensified, thus coming close to the planned level of 2010 of 1 million. For instance, in 2002 alone, the city population rose by 33 thousand, of which 78% were migrants from rural areas and 22% constituted net growth.

Manufacturing (34%), trade (25%) and transport, storage and communication sectors (15%) are major industries of the city. Among others, manufacturing, i.e. textile, food, livestock-related industries, has been the driving force of city's fast growth in the last decade. From 2000 to 2003, the GRDP of Ulaanbaatar City grew at an annual rate of 14%. The growth has slowed down to 2% in 2003, while the manufacturing sector was still growing at 25% per annum. The following table shows the evolution of the Gross Regional Domestic Product in Ulaanbaatar by industry.

Table 1-19: GRDP in Ulaanbaatar by Industry, 2000-2003 (million US\$)

	2000	2001	2002	2003	Share in 2003	Annual Growth Rate 2000-2003	Growth Rate 2002 -2003
Manufacturing	92.8	102.9	130.4	163.1	34.0%	21%	25%
Agriculture, Hunting & Forestry	4.1	9.9	9.2	9.0	1.9%	30%	-2%
Construction	8.4	9.2	12.3	13.6	2.8%	18%	10%
Trade	100.3	106.8	118.1	117.5	24.5%	5%	-1%
Hotels & Restaurants	7.3	11.1	13.3	12.4	2.6%	19%	-7%
Transport, Storage & Communication	64.8	67.3	79.7	73.8	15.4%	4%	-7%
Public Administration	4.2	5.0	5.8	6.5	1.4%	15%	12%
Education	12.7	14.4	19.4	28.0	5.8%	30%	45%
Health & Social Work	6.6	8.2	8.8	9.3	1.9%	12%	7%
Other Community, Social & Personnel Service	4.7	6.7	14.5	8.7	1.8%	23%	-40%
Financial Intermediation	18.0	27.7	52.8	28.3	5.9%	16%	-47%
Real Estate, Renting & Other Business Activities	4.9	8.6	6.2	10.0	2.1%	27%	62%
TOTAL	329.0	378.0	470.6	480.3	100.0%	14%	2%

(Source): Statistical Handbook of Ulaanbaatar, Department of Statistics, Information and Research of Ulaanbaatar

The fast growing number of establishments in Ulaanbaatar also justifies the rapid economic growth of the City: 25% per annum from 2000 to 2003. The following table shows the evolution of the number of establishments in Ulaanbaatar.

Table 1-20: Number of Establishments in Ulaanbaatar, 2000-2003

	2000	2001	2002	2003	Annual Growth Rate
Private enterprises	3,633	12,144	12,754	16,276	24%
State-owned enterprises	301	316	338	302	0%
Government enterprises	656	656	893	849	7%
NGOs	245	245	1,890	1,879	97%
total	9,565	13,391	15,875	19,306	25%

(Source): Statistical Handbook of Ulaanbaatar, Department of Statistics, Information and Research of Ulaanbaatar

1.5.3 Budget Flow for Solid Waste Management in Ulaanbaatar City

While solid waste in Ulaanbaatar City is currently collected on a self-sufficient basis by each TUK as is described in Chapter 3, the City is financing compaction of waste at dumping sites

from its own budget. Duuregs contract out street cleaning and gardening activities to TUKs from their own budget. Since these contracts are rather open-ended, Duuregs often force TUKs to collect illegally dumped waste without payment. The National Government is not financing any solid waste management operations in Ulaanbaatar.

The sources of Duureg budget are mostly taxes levied to small businesses (transport, restaurants, kiosks, etc.), litigation fees paid to the Duureg court, and penalties and their accompanying interests against the violation of municipal regulations. The major sources of municipal budget are the property tax levied on business properties, vehicle taxes and the gun tax. Duureg taxes are partly used by the Duuregs themselves, partly redistributed to poorer Duuregs, and the remainders, which account for 60% of the Duureg taxes, are transferred to the State. At the Municipal level, Ulaanbaatar City uses a half of the Municipal taxes, while another half are transferred to the State.

The figure on the next page shows the flow of taxes and waste fees between payers, TUKs, Duuregs, the Ulaanbaatar City and the State.

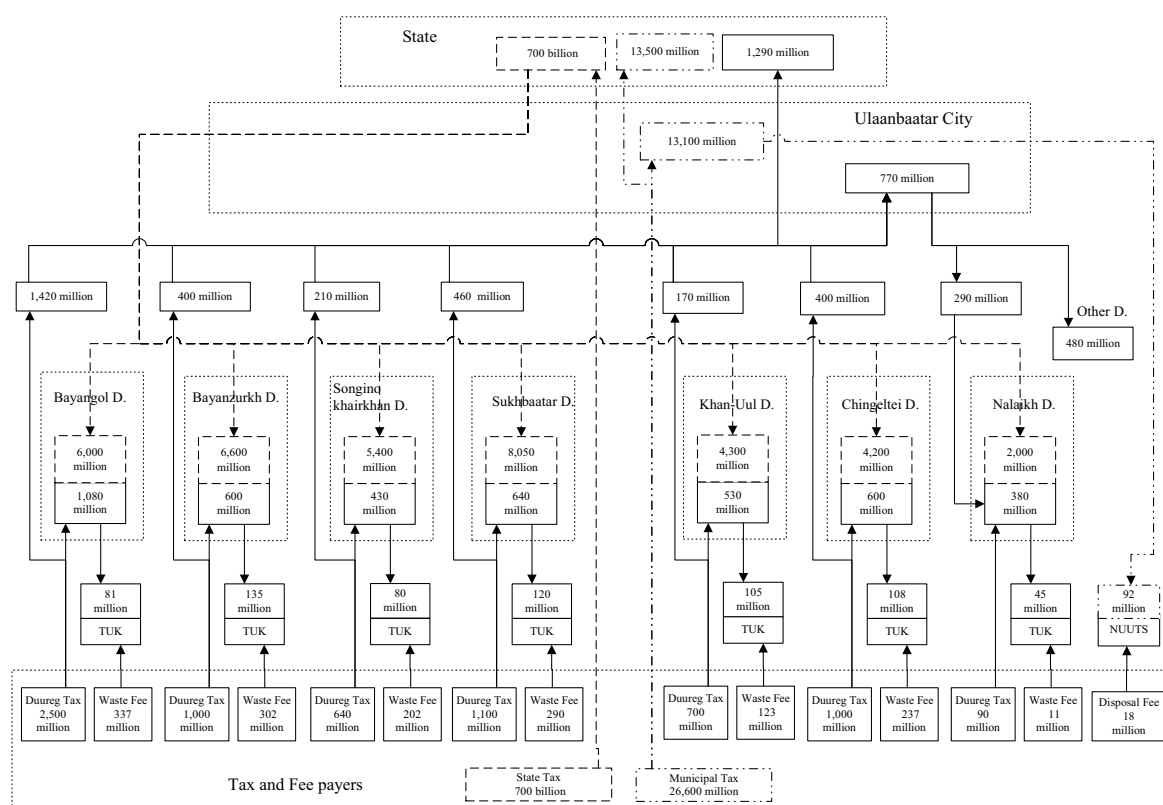


Figure 1-7: Flow of Taxes and Fees between Payers, TUKs, Duuregs, the Ulaanbaatar City and the State, 2004

1.5.4 Charging Systems of Taxes and Utilities

a. Charging System of Taxes

Officers at Duureg tax offices collect not only Duureg taxes but also Municipal and State taxes on behalf of the Ulaanbaatar City and the State. Wages to employees in the informal sector are usually not detected by tax offices thus are practically not subject to income tax. The following are the charging and enforcement systems of major taxes.

Corporate income tax (State Tax) Incorporated entities are required to pay a corporate tax to the Duureg office through bank transfer every month when sales revenues are recorded. In addition, these entities are required to quarterly submit tax documents to the Duureg office. Individual small businesses including kiosks and restaurants are usually not incorporated and

thus are not subject to corporate income tax. Duureg tax officers visit the companies every two years and inspect all the receipts. If incomes are not properly declared or the tax is not paid, the companies and/or their owners are fined. If they fail to pay the fines, their operating licenses/registration will be revoked, and when necessary, legal measures will be taken.

Individual income tax (State Tax) All employers are required to deduct individual income taxes from employees' salaries, submit tax documents to the Duureg office and make payment to the Duureg office through bank transfer. Although the taxes are principally due every month, several months' delay in payment is often accepted without a penalty. If the companies fail to transfer the tax to the Duureg Office, their operating licenses/registration will be revoked, and when necessary, legal measures will be taken.

Vehicle tax (Municipal Tax) Every owner of vehicles, either individuals or companies, must pay a vehicle tax every year. Technical condition of vehicles must be inspected every year and when the vehicle passes the test, a certificate is given to the owner in exchange of tax payment. Those vehicles that are not carrying a certificate are seized by the traffic police.

Business Property tax (Municipal Tax) Buildings and rooms being used for business purposes are subject to business property tax. Payment is required once a year for private owners and four times a year for corporate owners.

Income tax for small businesses (Duureg Tax) Since most of individual small businesses including kiosks and restaurants are not capable of preparing proper tax documents, Duureg tax offices collect an income tax from these small businesses once a year. If these businesses fail to pay the tax, they will be fined, and when necessary, legal procedures will be initiated.

b. Charging System of Utilities

The following table shows the charging system of utilities for apartment and ger residents:

Table 1-21: Charging System of Utilities for Apartment and Ger

Utility	New Apartments	Old Apartments	Ger
Water	Meter	Fixed rate per person	Public Tap
Electricity	Meter	Meter	Meter
Heating	Floor size	Floor size	None (own stove)
Waste Collection	Fixed rate per person	Fixed rate per person	Fixed rate per household

OSNAAG, a public utility agency wholly owned by MUB, is responsible for most heat and water distribution to apartment residents and its fee collection. In addition, the electricity company, TUKs and apartment's owners unions are contracting out their fee collection to OSNAAG on a commission basis. All of these fees are charged to apartment residents at one time every month. If an apartment resident fails to pay the fees for several months, the electricity will be disconnected. On the other hand, electricity and waste fees are collected separately in ger areas. This explains the high waste fee collection rates in apartment areas (90% to 95%) compared to those in ger areas (10% to 25%).

1.6 Environmental Policy

1.6.1 National Development Planning

The Program of Government Activities of November 1996 was the first to link sector reforms to macroeconomic reforms and indicated the Government's priorities in the urban sector as upgrading the quality, efficiency, effectiveness and sustainability of services. The Government's policy agenda included (i) reducing inequality in access and availability of services between apartments and the ger areas; (ii) improving financial resource mobilization,

in particular through private sector development, privatization and the introduction of cost-recovery and cost-sharing mechanisms, including tariff adjustments; and (iii) improving the operation and maintenance of infrastructure. These policy thrusts have endured to the present.

The new *Action Plan of the Government of Mongolia for 2004-2008* makes specific references to SWM, as well as more general and peripheral statements for action. Regarding urban development the Government will "promote initiatives involving private entities in delivering services such as the removal of trash in outskirt areas of the city"; and will improve public utilities in the ger areas. It will also "Substantially reduce the harmful wastes that slowly degrade in nature, and support activities which sort and recycle waste and refuse". Ecological education will also be intensified and penalties imposed on environmental polluters. Privatization will be encouraged and the registration of property will be improved, thus assisting in more effective collection of SWM charges. Regarding health: a health care voucher system may be introduced, which could assist in targeting underprivileged residents for possible subsidized SWM services, should this be considered appropriate. The dissemination of health information is also encouraged.

1.6.2 Environmental Policy and Legislation

Article 16, paragraph 2 of the Mongolian Constitution states that citizens of Mongolia have a right to live in an ecologically clean environment and to be protected from environmental pollution and ecological imbalances.

The main purpose of the Mongolian Law on Environment Protection, March 30, 1995 is the regulation of inter relations between the State, citizens, economic entities and organizations in order to guarantee the human right to live in a healthy and safe environment, ecologically balanced social and economic development, the protection of the environment for present and future generations, the proper use of natural resources and the restoration of available resources.

The Environmental Impact Assessment Law (EIA) of 1998, and its Amendments of November 22nd 2001, is the key law concerning environmental assessment in Mongolia, and is implemented by the MOE in collaboration with the Municipality. It requires EIAs and the obtaining of approval of environmental screening and environmental clearance before the implementation of major infrastructure projects. It stipulates that any projects or development initiatives are subject to Environmental Screening or General Environmental Impact Assessment (GEIA). The project proponent is required to submit summary and technical documentation to MOE in line with prescribed screening criteria; on the basis of which one of the following decisions will be made:

- To approve for implementation without further assessment, if the project impacts and consequences meet the requirements of existing environmental standards and requirements;
- In cases where negative impacts are deemed to be unlikely and / or insignificant project implementation may be approved subject to specific conditions regarding management and organizational measures to be taken;
- In cases where negative impacts are regarded as likely and or significant, the project may be required to undergo more detailed assessment or Detailed Environmental Impact Assessment (DEIA).

If a DEIA is required, the project proponent is responsible for contracting one of Mongolia's licensed environmental consultancy companies, of which there are more than twenty, to conduct the DEIA in accordance with the requirements. Enforcement and monitoring of the

implementation of Environmental Management Plans set out in DEIAs are the responsibility of local government agencies.

The Mongolian Environmental Assessment Program (MEPA) is a comprehensive environmental and natural resource review process, with reviews at every stage of policy, program, plan and project development. Presently the Department of Information Monitoring and Assessment in the MOE is responsible for reviewing the Detailed Project Reports of all proposed investment projects and for establishing environmental category designation according to the law.

According to the National Environmental Action Plan (NEPA) 2000, the most urgent environmental and natural issues facing Mongolia as well as UB are environmental challenges due to urbanization, specifically including the unsatisfactory disposal of solid waste.

1.6.3 SWM Policy and Legislation

Opinions about traditional SW practice in Mongolia vary. That most often heard, which is useful as a reference in attempting to improve current practices, is that the natural environment must not be blemished and, for example, someone was responsible for ensuring a clean site whenever nomads moved their camp. Some people regard this as being a rather romantic view, and that in fact nomads have always been casual about their litter, although very little of it was not readily biodegradable; and that when such habits are transferred to modern urban living they have very serious consequences.

There is a long history of formal SWM in Ulaanbaatar, for example one of the 49 "Rules of Ulaanbaatar City Administration Office" approved by the 2nd Ikh Khural on 11 December 1925 was "to clean up garbage". More recently Mongolia has taken an interest in, and adopted, international laws and conventions e.g. the Basle Convention provisions on the transport of hazardous waste; and now observes 6 International Conventions, 33 Laws and some 300 Regulations relating to natural resources, soil and vegetation, air quality, forestry, land, hunting, geodesy etc.

According to the World Bank's *Mongolia Environment Monitor 2004*, using MOE data, no budget allocations were made for SWM for the period 1996-2000, at either national or local level; but in 2000 the seriousness of the problem prompted the international donor community to make MNT 1,194 million available in loans and grants to address the most pressing challenges in the sector.

More recently the UB Master Plan, approved by the Government in 2001, and more particularly the City Development Strategy (CDS) of March 2001, do identify, albeit in rather general ways, the importance of SWM. Vision 3 of the CDS outlines the goals for "Living Environment and Social Life" and includes the desire to "create an integrated solid waste management system".

Over the last four years in particular the legal environment for SWM in Mongolia has been carefully developed, with the remaining task being to fully develop the regulations and capacity to fully implement this.

The *Measures for Strengthening Waste Management - Mongolian Government Resolution N256*, 3 November 2001, is more detailed than the *Action Plan of the Government of Mongolia for 2004-2008*; and is essentially a SWM Action Plan. It provides a set of 6 Purposes, each with a number of Processes, and identifies responsible institutions, financial sources, timings and expected results. The main provisions are:

1. To develop and improve implementation methods for waste disposal, including improving legislation and the structure of responsibilities for SWM.

2. Improve waste collection and transport.
3. To clean waste and reduce soil pollution in urban areas
4. To establish final waste disposal sites with hygienic conditions in Ulaanbaatar, and specifically to close Dari Ehiin ovoo and Ulaan Chuluut, and rehabilitate them. To establish a medical waste incineration facility in Ulaanbaatar.
5. To establish / support waste recycling facilities.
6. To improve the human resources in SWM through foreign training and to educate the general public.

Many of the detailed actions have been accomplished and a number are still relevant today and are being actively pursued.

The Joint Order by the Minister of Health and the Minister of Environment and Nature on the Improvement of Waste Management of Health Organizations. 17 Sep, 2002. Ref. No 249/201 was issued in order to implement Government Resolutions No. 256 and No. 135 *Requirements for the Removal and Disposal of Hazardous Waste -Mongolian Government Resolution N135*, 3 July 2002, by approving instructions for dealing with health care waste, obliging relevant Governors and Officers to provide appropriate budget allocations and providing for suitable training.

The Joint Order by the Minister Of Health and the Minister Of Environment and Nature On Chemical Waste Management, 2002/3 provides a classification of chemical waste, primarily as toxic or hazardous. It adds detail to the Mongolian Law on Protection from Toxic Chemicals, April 14, 1995; the main objective of which is to regulate the production, export, import, storage, trade, transport, use and disposal of toxic chemicals.

The 2003 *Law on Domestic and Industrial Waste*, effective from July 2004, is currently being converted into practical regulations by the MOE and MUB's City Maintenance and Public Utilities Division, and these are expected shortly to be considered by the City assembly. Following approval there they will then require the sanction of the Government Cabinet before they can be implemented. Under this law only authorized contractors are able to collect and transport SW. The new Regulations will also make new provisions for the collection of charges and it is possible that all charges i.e. from both formal and ger areas, will be consolidated in either a single City or multiple District SWM Funds.

The MOCUD views SWM as a high priority and is particularly interested in improving the financial health of the sector, so that it can operate more effectively, and in encouraging separation and recycling. One idea being discussed within the Ministry is the imposition of an import tax, or a transfer from an existing tax, on the "waste content" i.e. packaging etc. of imported goods. The revenue from this may be placed in a Fund dedicated to the improved operation of the sector, and perhaps to assist in establishing a system of waste separation / recycling / re-use. This might take the form of a series of collection / processing points for particular waste categories; which it is thought would best operate if payments for receipt of waste were made. Such legislation would be in line with "producer responsibility" legislation introduced by some Western European and other countries. The first products covered there were packaging waste, but it is now being extended to, for example, electronic equipment, vehicles and tires.

MOCUD are also actively considering the establishment of a regulatory authority for public utilities, particularly the water sector, including user charges. This would have the advantage of weakening the effect of any political reluctance to increase prices, even by justifiable amounts, by de-politicizing the charge-setting function and making it a principally technical activity. A regulator for the energy sector has been active for some years; and it may be that SWM could be included under the authority of a broad public utilities regulator.