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DISCUSSION PAPERS

MONGOLIA

Wood Supply in Mongolia: The Legal and Illegal Economies

August 2006

THE WORLD BANK

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This study was prepared by the Environment and Social Development Unit (EASES) of the East Asia and Pacific Region, and was funded by The World Bank's Netherlands-Mongolia Trust Fund for Environmental Reform.

Environment and social development issues are an integral part of the development challenge in the East Asia and Pacific (EAP) Region. The World Bank's Environment and Social Development Strategy for the region provides the conceptual framework for setting priorities, strengthening the policy and institutional frameworks for sustainable development, and addressing key environmental and social development challenges through projects, programs, policy dialogue, non-lending services, and partnerships. The EASES Discussion Paper series provides a forum for discussion on good practices and policy issues within the development community and with client countries.

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Contents

Figures

Tables

Boxes

Foreword

The forests of Mongolia protect watersheds and water supply, and as a source of timber, fuelwood, pine nuts, berries and game they are saviours and sustainers of livelihoods. As shown in this report, and in the World Bank's *Mongolia Forestry Sector Review* (2004), the forest sector is in crisis. Lack of planning and active management, lack of inventory, loss of capacity, and corruption have together led to significant degradation of forest quality, and have created virtual anarchy in the forestry industry. It is crucial that the Government of Mongolia acts now to bring control to the sector, and ensure that this important resource can be used sustainably for generations to come.

Wood Supply in Mongolia: The Legal and Illegal Economies is the latest in a series of studies on environmental issues in Mongolia produced by the Environment and Social Development Department of the East Asia and Pacific Region of the World Bank. Other topics include the environmental and social impacts of mining, and the illegal wildlife trade. The current report is closely linked with the World Bank's concern about the adverse impacts of weak governance on the management of natural resources, identified as a key issue in the Environment Strategy for the East Asia and Pacific Region. The World Bank is supporting the Government of Mongolia in its efforts to address these problems—most recently through the Netherlands-Mongolia Trust Fund for Environmental Reform (NEMO), a wide-reaching initiative that has touched almost all aspects of environmental management in Mongolia in 2005–6. This publication was supported by this trust fund, as well as the Bank-Netherlands Partnership Program.

This report represents a novel and unconventional approach to the very serious subject of illegal wood supply in Mongolia. Rather than just relying on official statistics, which have many drawbacks, the team sought information from a range of sources, such as direct interviews with government officials and others working in the sector; field observation of illegal activities, often in the dead of night; and indirect approaches using various data sources to test assumptions.

We are very grateful to the whole team (and especially to Ms. Erdenechuluun) for their perseverance in the preparation of this report. We hope both governmental and nongovernmental bodies find it useful, and that it helps the donor community in their attempts to bring order to, and prosperity from, the important forest resources of Mongolia.

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Acronyms

AAC	Annual Allowable Cut
FLEG	Forest Law Enforcement and Governance
FPCD	Forest Policy Coordination Division (Ministry of Nature and Environment)
FWRC	Forest and Water Research Centre (Ministry of Nature and Environment)
GDP	Gross Domestic Product
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit (German Agency for Technical Cooperation)
IDA	International Development Association
ISP	Improved Stoves Project
MIT	Ministry of Industry and Trade
MSWL	Ministry of Social Welfare and Labour
MNE	Ministry of Nature and Environment
MoF	Ministry of Finance
MOSTEC	Ministry of Science, Technology, Education and Culture
NGO	Nongovernmental organization
NFP	National Programme on Forestry
NRM	Natural Resource Management
NSO	National Statistical Office of Mongolia
NTA	National Taxation Authority
NTFP	Non-timber forest product
SSIA	State Specialized Inspection Agency
UNDP	United Nations Development Program
USSR	Union of Soviet Socialist Republics
USIP	Urban Services Improvement Project
VAT	Value-added Tax

Notes:
All dollars are U.S. dollars; all tons are metric tons.

The Mongolian unit of currency is the Tugrik (Tg). In 2006, $1 = Tg 1,175.

Aimag (= province) is the largest sub-national administrative unit; below the aimag is the *soum* (= district), which is divided into *bags* (= sub-districts). In the capital city districts are called *duureg* and sub-districts *khoroo*.

Ger simply means home in Mongolian. Gers are traditional dwellings, well adapted to the nomadic life of Mongolia's herders, and consist of a wooden framework and a felt cover. The wooden framework includes the walls, long poles, a round smoke escape and its supports. Inside the ger, felt is laid either on a wooden floor or straight on the ground. The number of walls and poles determines the size of the ger. Most herders' gers have five walls, which make a living area of 16-18 m^2. Each ger has a hearth, which is of great symbolic and functional importance. In the winter the hearth heats the ger and also serves as a stove for cooking. Gers weigh approximately 224 kg. It takes about half an hour to collapse an average ger and slightly longer to rebuild it (World Bank, 2004).

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Executive Summary

Forestry has been an important industry for Mongolia, and has great potential today as a source of sustainable livelihoods for those in forested aimags. Forested watersheds safeguard the quality and quantity of water, and timber and fuelwood also are essential products for Mongolians, who rely on forest resources for cooking and construction, particularly in rural areas. However, as illustrated in this report and also in the World Bank's *Mongolia Forestry Sector Review* (researched 2002, published 2004), the forest sector is in crisis. Lack of planning and active management, lack of inventory, loss of capacity, and corruption have together led to a significant degradation of forest quality, and have created virtual anarchy in the industry. Moreover, the forest sector suffers from poorly conceived and uncoordinated government policy. This policy vacuum, combined with poor law enforcement and the significant financial gains to be made from illegal forest harvesting, is preventing the establishment of an efficient and sustainable forest industry.

Mongolia's forest estate comprises predominantly northern coniferous forests and shrub saxaul forests in the southern desert and desert steppe. It is the northern forests that are increasingly under threat from commercial forestry, although the lack of a management strategy for collection of fuelwood and timber for domestic construction means that wood resources are under pressure in areas throughout the country. Statistics on deforestation and forest depletion in Mongolia are confusing and often conflicting. Mongolia lost an estimated 4 million hectares of forest in the last century, averaging 40,000 ha/year, although the deforestation rate increased during the last decade of the century to approximately 60,000 ha/year (World Bank, 2003). Today, Mongolia's "forest territory" is estimated as 17.9 million hectares, of which around 1.8 million hectares are non-forested areas, 4.5 million are the southern saxaul scrub forests, and the remainder are the 11.5 million hectares of northern coniferous forests (Crisp et al., 2004). The lack of regular forest inventories makes it impossible to know the true extent or quality of forest resources.

The sustainable annual harvest volume for Mongolia's forests has not yet been unequivocally determined, although the most recent calculations put the amount at between 0.9 and 1.4 million m^3. The current rates of consumption are difficult to calculate, due to the lack of reliable data and the differences of opinion concerning the annual household consumption of fuelwood in areas outside the capital. The lower end of the estimated consumption, 1.74 million m^3 annually, is far above the sustainable harvest level, and the upper end, 5.5 million m^3, exceeds the sustainable harvest by a factor of five. Wood consumption also appears to be growing, due to factors such as the increasing population, booming construction industry, high rates of migration to urban areas, rising incomes for some, and the privatization of land.

The Mongolian government has followed a policy of trying to reduce consumption by restricting supply, and sets a low harvest limit each year—617,200 m^3 in 2006. Not only is this far below any estimates

of actual annual consumption, creating a situation where illegal logging and trade is bound to occur and corruption is becoming endemic, but it is even lower than the estimated sustainable harvest level, which has the dual effect of denying the state its proper revenue from forest-use fees, and denying companies the opportunity to operate legally in the industry. The policy has had no real benefit as far as the conservation of the resource is concerned; illegal operators have stepped in to supply the high demand for timber and have met no real resistance from the authorities charged with controlling the industry. Illegal timber, which is readily available in Ulaanbaatar (85 to 90 percent of all wood consumed), artificially lowers prices, making it difficult for legal operators to compete and ensuring that demand remains high, as the materials are essentially subsidized.

The forestry sector is thus dominated by the illegal trade, and in particular by networks of organized crime controlled by powerful individuals with contacts deep in the government, police, and judicial institutions charged with preventing the illegal trade. In recent years, an increased emphasis by the government on high profile inspections has resulted in forcing small-scale traders out of business, while leaving the large-volume, well-connected traders to continue their business freely. At the same time, poverty and unemployment forces people to work in the sector for very little reward, or to gather fuelwood for subsistence needs illegally. A lack of training and alternative livelihood opportunities for those previously legally employed in the industry, such as in former Soviet socialist forestry towns, means that a large number of people have little choice but to continue with their activities.

The role of the government is crucial in bringing order to the forestry sector. There are many obstacles to effective management, including lack of financial resources and human capacity; lack of clarity over roles and responsibilities of management and enforcement agencies; lack of a long-term strategy; inability to retain high-level staff in the forestry sector, and poor policies and unclear legal and regulatory frameworks. The problems are exacerbated by poor attitudes and motivation, work procedures, and accountability mechanisms at every level of the government. Corruption is rife within all institutions associated with the trade chain, and much of the money that should go into the state budget ends up in private pockets. This is well known both in the industry, by government officials, and by consumers; for example, information concerning the usual price of bribes was obtained without difficulty. Due to the domination of the forestry sector by the illegal economy, the available data on harvest, trade and consumption are generally unreliable and, in some cases, deliberately falsified to generate confusion—resulting in incorrect management decisions.

Immediate, effective, and realistic actions need to be taken by the government to prevent long-term damage to Mongolia's forest resources, to enable the sector to contribute to the economy to the full extent possible, and to continue to provide necessary products for Mongolians. Although the Government of Mongolia has recently stepped up its measures to combat illegal logging—for example, through high-profile inspections—such actions have had little noticeable impact, and have failed to address the central and underlying problems of the forestry sector in an adequate manner. Many of the necessary institutions, laws, and regulatory frameworks are already in place; the Government of Mongolia now needs to recognize the importance of this sector and increase the political will to reform it. The new Anti-Corruption Law and the work on governance in the environmental/natural resources sector supported by a major new World Bank IDA grant should contribute to this, and the best way to indicate the political will to address illegal logging would be by appropriate budget increases.

A long-term forestry strategy should be developed that comprehensively addresses all the actors in this complex business, including programs designed to tackle corruption in the civil service as part of a far-reaching reform; to prosecute the criminals who profit from the trade; and to provide workers with opportunities to work legally in the sector, or to provide training for alternative livelihoods. Instead of focusing exclusively on restricting the supply of timber, government policy must balance these actions with a strategy to reduce the demand for certain types of timber, for example by using tax disincentives to downsize the industry and promote efficiency and use of alternatives. In parallel with measures to tackle the commercial illegal timber trade, a national strategy should also be developed to cover fuelwood collection and supply to urban areas, an urgent issue that is currently being overlooked

and has led to high pressure on easily accessible forest stands and in areas with limited resources. With the imminent revision of the Forestry Law, more opportunities are expected to be created for the involvement of local communities in forestry. This is a promising approach that can provide both civil oversight by those with a long-term interest in the sustainable use of resources, as well as opportunities for the rural poor to benefit from Mongolia's forest resources. The Government of Mongolia should continue to explore these options.

1. Forests and Forestry in Mongolia

Mongolia is a landlocked Central Asian country with a harsh continental climate and similarly severe landscape, ranging from high mountains to desert at the lower elevations. From the cool, forested regions in the north, to the arid Gobi desert in the south, the country is host to a range of different ecosystems. Historically, Mongolia has supported an extremely low population density, and although population size has doubled during the last 50 years, still there are only 2.3 million inhabitants. Following the collapse of the USSR in 1990, Mongolia is still in the process of undergoing a period of social and economic change, with the government choosing to pursue a swift transition from a centrally planned economy to a market-based one. Unemployment and poverty rose dramatically after 1990, and many urban residents returned to the traditional livelihood of livestock herding. Opportunities are now on the increase, and a wave of migration to urban areas is taking place. The proportion of Mongolia's population officially registered as living in the capital, Ulaanbaatar, is 38 percent (Dore and Nagpal 2006), but the actual figure may be even higher. Although it is now more than 15 years since the Soviet period ended, the country still remains relatively unknown to the western world.

Forest Resources

Mongolia's territory spans the major transition zone between the deserts of Central Asia and the boreal taiga of Siberia. The forest estate is therefore varied, but can be broadly divided into two types: the predominantly coniferous forests of the north (boreal, montane, and mixed forest-steppe), and the saxaul shrub forests of the southern desert and desert steppe. Mongolia's extreme climate means that forests are slow growing, and therefore very sensitive to overexploitation.

Figures published in 1997 (Forest Management Project Centre, in Crisp et al., 2004) estimated that there are more than 16 million ha of actual wooded areas in Mongolia. Mongolia's northern forests— excluding saxaul and other shrubs and brush in the south—extend over 11.5 million ha, of which 10.4 million ha are considered to be fairly intact (> 30 percent crown closure), and 1.1 million ha are considered depleted. Until recently, most forestry data were compiled using representative sampling techniques, with detailed surveys of some areas produced as needed for specific enterprises. A comprehensive survey by political division (aimag, soum) has been ongoing since 1996, but the results of this study have yet to be released. Although the Mongolian Law on Forests requires a complete survey of the nation's forest resources to be conducted every 10 years, current capacities and spending levels would allow for such surveys to be completed on average only once every 23 years (MNE, 2002).

The Mongolian Law on Forests divides Mongolian forest resources into three zones as the primary basis for management:

- The Strict Zone includes forest areas classified as "sub-alpine," and those that lie within special protected areas, national parks, nature reserves, and cultural monuments. Very limited exploitation in some areas is allowed for local fuelwood needs, and for designated non-timber forest products (NTFPs) such as pine nuts and shed deer antlers.
- The Protected Zone establishes broad-scale restrictive "green areas" within 5 km around the periphery of the headwaters of major lakes and rivers, 3 km on each side of major rivers, 1 km on each side of a railway or major road, and a radius of 80 km around big cities and 30 km around smaller towns. In addition, commercial forest harvesting is prohibited on slopes over 30°, on forests less than 100 ha in size, within 50 m of the edge of a harvesting block, and in all saxaul forests. The regulated collection of domestic fuelwood and harvesting of NTFPs are the only forms of exploitation permitted.
- The Utilization Zone is a default category covering the remainder of the forest. These forests are designated for commercial timber harvest under permit and with fees paid to government.

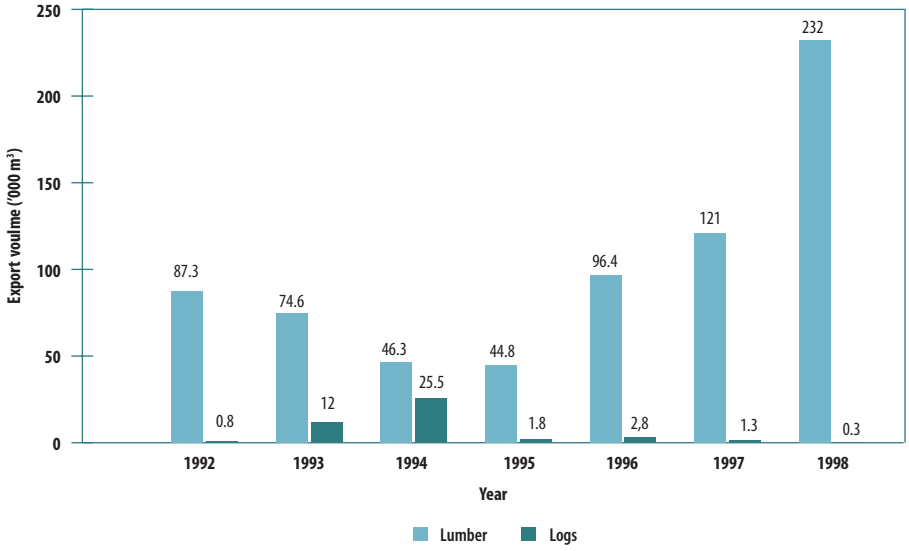
Different sources quote different percentages of Mongolian forests within each category. The *Mongolia Forestry Sector Review* (Crisp et al., 2004) refers to estimates that 47 percent of the total area is within the Strict Zone, 46 percent in the Protected Zone, and 7 percent in the Utilization Zone, reflecting the government's current emphasis on natural resource protection and conservation. Given the current lack of proper management, this approach is probably prudent.

Statistics on deforestation and forest depletion are confusing and often conflicting. Nevertheless, it has been estimated that Mongolia lost approximately 4 million ha of forest in the last century, averaging 40,000 ha/year, although the deforestation rate increased during the last decade of the century to approximately 60,000 ha/year (World Bank, 2003). The major causes of forest loss have been unsustainable timber harvesting (both permitted and illegal) for timber and fuelwood, extensive crown fires,[1] mining, insects and disease, uncontrolled grazing, and long-term climate change.

The application of clear-cutting forestry techniques from the former Soviet Union was clearly unsuitable

[1] It should be noted that occasional ground fires in forests, despite widespread conventional wisdom, can be beneficial to the forest stands, as burning of the undergrowth can reduce fuel loading and hence the risk of intense crown fires, and can also help in controlling insect pests and increasing NTFPs.

Figure 1. Exports of Timber and Uncut Logs, 1992-1998 ('000 m³)



in Mongolia and caused great damage to the country's limited forests. This practice has now effectively halted in legal fellings. Since the 1990s, however, a variety of other unsustainable practices have taken hold. Particularly in the past few years, with the dramatic increase in illegal logging, non-professionals have begun harvesting small trees without proper planning or equipment and without making provision for regeneration or effective replanting of cut areas. Although there is a lack of empirical data on illegal logging, it is evident that this situation has had a significant negative impact on the structure and composition of Mongolia's forest resources, especially in the forested areas surrounding Ulaanbaatar. The timber industry is increasingly dominated by non-professionals who typically cut the best timber from the most convenient locations, trimming away all but the pieces they need and discarding the wood they regard as scrap. Prior to 1990, logs were sent to timber mills for processing and scraps were used for fuel. With the lack of organization and widespread illegal activity in the forestry sector today, incomplete use is being made of the forest resources—much of the wood is left where it was felled, with additional trees being cut for fuelwood.

In the 1990s, large volumes of timber were exported from Mongolia, predominantly to the growing market in China. The statistics on formal timber exports for this decade are unreliable, and in reality it is possible that far greater quantities of wood were exported than official figures suggest (Figure 1). Many people did not obtain export licenses, and even those traders that were in possession of a license would smuggle wood out of the country or under-declare their loads in order to evade license fees, customs duties, and income tax. Concern over the state of Mongolia's forest resources led to a ban on the export of timber in 1999, which appears to have been successful in preventing timber from leaving the country. According to a source from the Ministry of Industry and Trade (MIT), this initially led to a decrease in harvests, but in response to the rapidly growing domestic demand, logging—and the sale of timber—has increased dramatically in recent years, and may well be close to that of the period before the ban.

There has not yet been a precise determination of how much timber can be harvested from Mongolia's forests on a sustainable basis. Existing data on this topic are inconsistent. This is in part due to the confusion over the changes in forest zonation and a lack of clarity over what may be permitted in the general "protection zone," leading to different assumptions on how much of the forest estate could contribute to the annual allowable cut (AAC). The most recent published estimate for the sustainable AAC has been calculated as 0.9 to 1.4 million m^3 (Crisp et al., 2004).[2] Recent estimates[3] by senior specialists in the Mongolian forestry sector produced a figure of no more than 1 million m^3. These estimates are thought to be more realistic than previous figures; research by the Russians in Soviet times found that Mongolia should have the capacity to harvest 4 to 5 million m^3 of timber annually,[4] and Finnish researchers obtained an estimate in the mid-1990s of 3 million m^3. However, the large-scale, often illegal, and generally uncoordinated logging practices encountered in Mongolia today have led to a depletion of available forest resources in certain areas, particularly those within easy reach of urban centers. In the short- to medium-term, it is likely that the disarray that has existed within the forestry sector means there are large amounts of timber that can be extracted through thinning activities, which are necessary to maintain fire-resistant forest structure, and this will provide employment and biomass for construction and energy needs. In the long term, Mongolia's slow-growing forests are unlikely to be able to sustain the current demand for timber, and efforts will be needed to find alternatives.

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2 Restrictive zoning of Mongolia's forests has resulted in a fairly low proportion of the estate legally available for exploitation. A rigorous analysis based on environmental and economic operability might be expected to release a further 25 percent of the current protected zone for harvesting; therefore, the AAC is calculated based on all utilization forests plus 25 percent of the protection forest estate. The calculation does not take into account accessibility of forest stands, and the fact that birch and aspen are not currently commercially harvested; these two factors may reduce the calculated AAC by a further 25 to 30 percent.

3 This estimate assumes the exploitation of timber from the Khuvsgul taiga region. It remains to be seen whether these forests can in fact be utilized in the near future, given the outdated technologies and lack of finance and infrastructure that confront the forestry industry today.

4 There was no zonation in place at this time, and this estimate is probably based on the total "operational" forest estate, equivalent to the current production zone plus about 55 percent of the general "protection" zone.

The Socioeconomic Context of Illegal Logging

Illegal logging in Mongolia can be broadly divided into three broad types, according to the socioeconomic context in which it occurs; (1) securing basic subsistence needs, (2) enhancing livelihoods, and (3) commercializing illegal logging.

Securing Basic Subsistence Needs

In rural areas, much of the fuelwood and timber used by families for construction is collected without permits, and is therefore technically against the law. Although there is a permit system in place, it is not really designed to control collection to meet the subsistence needs of those who live in remote parts of the country, and therefore this cannot be truly classified as illegal. Worryingly, there is no effective management over where or how wood can be taken, and no strategies in place for reducing demand in those parts of the country where timber resources are under pressure.

In urban areas, many people, particularly the unemployed poor—underprivileged families in ger districts, women, the elderly, and even children with spare time—cut timber illegally to meet their subsistence needs, both for heating and construction. As urban residents, these people are not eligible for fuelwood and timber permits, but they cannot afford to buy wood from the markets and therefore do not consider that they are acting illegally. Many of the people who cut wood for their own needs also cut wood for sale at certain times of year.

Although the actual quantity of timber cut per person is not great, these activities can cause major damage

In rural areas, many people harvest wood for their subsistence needs without an official permit. They do not consider their actions to be illegal. Image: Tsetsegdelger, May 2006.

to easily accessible areas; small trees that can be easily felled with handsaws are particularly vulnerable. Forest rangers are unable to control the harvest—they are outnumbered, and their issuing of warnings or confiscating sacks of wood has little effect.

Enhancing Livelihoods

This category involves the greatest number of people and is carried out both by individuals, particularly the unemployed poor, and more commonly by small groups of families, neighbors, and friends who sell timber on a more organized basis. While illegal logging is the primary form of income for some people in this category, others cut timber only when they are in need of money.

Individual loggers mostly cut dry, dead timber for sale as fuelwood, but may also cut living trees. Logs are sold by the side of the road for 4,000 to 5,000 Tg per bundle. These people prepare and sell timber principally during the wintertime, typically cutting small trees and carrying them down into the city on their own, or in some cases transporting logs on carts or sleighs. Larger trees are taken in winter, as they are easier to drag over the snow. Somewhat wealthier loggers, who can deal in larger quantities, transport logs on horse carts. Many of the groups of people who regularly harvest timber for sale are residents of former forestry towns (Box 1), where the legal industry collapsed following the 1990 transition. These people may sell the timber locally, or they may sell it on to organized, commercial networks for sale in Ulaanbaatar.

Commercializing Illegal Logging

Most illegally harvested timber is channeled through this group, made up of businesses with forestry licenses or by large, organized groups that conduct illegal trade without the screen provided by a legal counterpart.

The majority are companies licensed to operate in the forestry sector, having obtained permission to cut a certain amount of timber. Such companies can possess either an industrial or a fuelwood logging permit or both. The quantity of timber indicated in the license is unimportant as long as the company has an allocation of some kind. These companies also frequently misuse both certificates of origin and forest-use permits; the former are required to establish the legal origin of timber in trade, and the latter define the area of forest from which a company can harvest timber. Some of these businesses are the remnants of old timber mill operations from the socialist era; others are newly established groups that have managed to obtain permits through various contacts.

In addition to illegal activities by legally registered companies, there are some very large groups engaged in illegal logging on a permanent basis that do not have licenses or permits of any kind. These groups do not have the connections required to obtain a timber harvest allocation from the Ministry of Nature and Environment (MNE) or to obtain the proper permits, but instead use their close ties with employees working in the environment sector. These groups are highly organized, and run "professional" operations without fear of being caught. Each group is usually controlled by one powerful individual, and has its own network of contacts at every stage of the operation, which provides a means of escaping any obstacles. This may well be the most difficult category of illegal loggers for government bodies to tackle.

Institutional Roles and Responsibilities for the Management of Forest Resources

MNE is responsible for the development of policy and regulations concerning forest management. Development of forest policy is handled by the Forestry Policy Coordination Division (FPCD) of MNE, and implementation is by the Forest and Water Research Center (FWRC), one of MNE's two technical agencies. The FWRC was previously under the Water, Forest and Natural Resources Agency, which was split to form this agency, and the separate "Water Authority," which handles all issues relating to water (the title of the FWRC is in fact misleading, as it is responsible only for forestry issues). FWRC is responsible for providing technical advice on forest resources, conducting inventories, developing aimag- and soum-level forest management plans, studying and combating insect pests and diseases, and managing seed collection and the operation of tree nurseries. A National Forest Policy was prepared in 1998, and later revised in 2001 as the National Programme on Forestry (NFP). Coordination and implementation of this program is guided by the National Forestry Committee, an inter-ministerial group headed by the

Box 1. Former forestry Towns: Few Alternatives

Most of the groups of people who actually harvest timber on a regular basis are from socialist-era forestry towns, such as Tunkhel, Bugant, and Tosontsengel. With the collapse of the centrally planned economic structure and the failure of privatizations in the early 1990s, many factories shut down and left their employees out of work. Some of these unemployed forestry-sector workers come from a long tradition of timbermen and know no other profession. Others were sent in their youth from various corners of the country to establish the new forestry towns, where they were trained in the timber industry. Such people have spent most of their adult lives in the forestry towns, but have no close relatives there; some may wish to return to their native areas and their relatives, but have been away for too long. The lack of alternative employment and revenue-generating opportunities in these towns has left people with few livelihood options. A quote from the manager of one of the few old timber mills remaining in operation is illustrative:

"I know all about these people's lives and their backgrounds. Now I am responsible for them and I cannot do anything to stop them. In some cases, I coordinate the illegal logging activities myself, in order to put bread on their tables."

As these people do not have the money for transportation, fuel, or the skills or contacts required to pass through check points and inspections, they mostly sell the timber on-site in bulk. The profit is minimal, only enough to meet their basic needs; a much greater profit is made by the people who buy from them. The government has not taken action to retrain the populations of these "artificial" towns, or provide other income-generating opportunities; nor has it made any plans for definite action in the future. Thus this professional, trained workforce will probably continue to depend on the timber industry in the future. People in this group do not have logging permits, but are not ashamed of cutting timber without authorization. If challenged, they blame the policy and actions of the government, and demand that the government legalize their activities and provide support. They ask outsiders to voice their concerns to the relevant government institutions.

Minister of Nature and Environment. The Ministry of Industry and Trade (MIT) is responsible for regulating import and export of timber, and also consolidates and tracks applications for the harvest of industrial timber from processing and logging companies.

Responsibility for enforcement of forestry regulations currently lies with the Government of Mongolia's regulatory agency, the State Specialized Inspection Agency (SSIA), which until recently reported to the prime minister's office, but now is headed by a separate minister. The agency has an Environment, Geodesy and Cartography Inspection Department, which has a range of responsibilities, including monitoring and enforcing the implementation of environmental management plans produced as part of the environmental impact assessment (EIA) process. MNE has had a somewhat uneasy relationship with the SSIA, and in 2005 an Office for the Coordination of Wood and Wood Materials Inspection was established under MNE in an attempt to bring some of the inspection responsibilities back under MNE's jurisdiction. This was in fact found to be in violation of Mongolian law, which states that inspections units should be kept separate from the ministry that established the regulations. In February 2006, the office was abolished following a decision by the Ministry of Justice and Internal Affairs. Building a criminal case for the

prosecution of illegal loggers and traders is the responsibility of the police force, which does not yet have any staff specialized in environmental investigation.

Increasingly, the central government is delegating responsibility for natural resources and environmental administration to the aimag and soum level. Implementation of forest policy and regulations at the aimag level is through their environmental protection agencies. At the soum level, forest and water issues are the responsibility of the forest rangers. Rangers are responsible for patrolling forests designated for utilization and also protected areas, and for issuing permits for fuelwood and private-use timber harvesting. Responsibility for inspection is also largely handled at the local level; in 2005, there were three or four environmental inspectors for each of the 21 aimags, and Ulaanbaatar had 18 aimag-level inspectors and 16 inspectors reporting directly to the Ulaanbaatar city government. There were about 340 inspectors at the soum level.

Procedures

Setting Maximum Harvesting Volumes and Issuing Logging Licenses

The national maximum timber harvest levels are determined by MNE at the beginning of each year. Previously, the AAC had been assigned to four categories—industrial timber, private-use[5] timber, fuelwood, and wood collected from forest thinning and cleaning activities (Table 1). In 2006, the timber from forest thinning was included within the limit for private use timber—considered to be an improvement, as the previous distinction was in fact not particularly meaningful. These maximum quantities are further subdivided among aimags, and the industrial quotas are allocated to organizations. In recent years, the ministry has followed a policy of keeping these limits at a fixed level; approximately 40,000 m^3 for timber production and 600,000 m^3 for fuelwood.

The procedures for setting and allocating the AAC are as follows:

- Each soum with timber resources submits to the appropriate aimag administration a proposal indicating the volume of timber it wishes to be harvested from its territory the following year. The aimags consolidate these requests and forward them to MNE. Applications for industrial timber production are also submitted to MIT.
- Meanwhile, each timber processing or logging company also submits to the relevant aimag administration an application for permission to harvest a specific volume of timber in the following year.[6] MIT consolidates the industrial timber production applications received from all aimags and submits an aggregate proposal to MNE.
- MNE reviews all proposals and applications, then sets a maximum limit for timber harvesting in the upcoming year. This AAC is divided among those forested aimags that have applied to harvest timber, and again subdivided by the aimag governors among the soums. The administration of each soum allocates its annual timber harvest according to the territory monitored by each

5 Private-use timber is understood here as timber not processed by a commercial industry at any point, although it may be traded.

Table 1. Harvest Volumes ('000 m^3) Approved by MNE (2001–2006)

Year	Industrial use	Private-use timber	Fuelwood	Wood from thinning/ clearing	Total volume
2001	72.6	n/a	603.5	n/a	676.1
2002	39.0	n/a	580.0	n/a	619.0
2003	39.5	10.0	571.0	2.0	620.5
2004	44.3	18.5	585.0	5.0	647.8
2005	39.9	—	570.0	—	609.9
2006	32.5	14.0	570.7	n/a	617.2

forest ranger. Areas suitable for industrial timber production are identified by the FWRC.

- Following decentralization of decision making in 2005, responsibility for the allocation of the industrial timber harvest is being transferred from MNE to aimag governors, who allocate their quotas among the applicant companies. In 2006, aimag governors had control over 50 percent of the total quota, with the remainder under the control of the MNE.
- Once industrial timber quotas are allocated, the deputy-governor of the soum administration transmits the "Certificate of Origin for Timber and Raw Wood Materials" (hereafter referred to as the certificate of origin) prepared by MNE to the appropriate licensees within his or her jurisdiction. In addition to this certificate, the logging company must also possess a forest-use permit. Fees are collected by a soum-authorized official (typically the environmental inspector).
- The Citizens' Representative Council of each aimag allocates private-use timber and fuelwood production limits among its respective soums. The soum forest ranger is responsible for setting the locations from which these types of timber can be cut, and issues logging permits in exchange for the payment of a forest-use fee. This permit serves both as a receipt for payment and as a license for the preparation of fuelwood.

A conflict of interest exists at the level of the aimag administrations, which are urged by MNE to minimize timber harvests but at the same time depend on the forestry-generated revenues planned by the Ministry of Finance (MoF). Local authorities have a stronger interest in pushing for the maximum possible quantities of timber to be harvested in order to generate increased budget revenues than in encouraging the sustainable harvest of their forest resources. The majority of the revenues generated from forestry fees (85 percent) are supposed to be reinvested in conservation of the resource in accordance with the Mongolian Law on Reinvestment of Resource Use Fees for Conservation (2000). In practice, this rarely occurs.

Certificate of Origin

In order to transport and sell timber intended for commercial use, businesses and other organizations must possess a certificate of origin, intended to verify the location of origin of the wood in question. Such permits are issued by MNE to the companies that have been allocated a harvest quota under the industrial timber allocation that year. Although the certificate of origin no longer serves its original function, having now become essentially a permit to transport timber, for forestry companies it is the most difficult document to obtain—yet most essential to avoid expensive bribes. Despite the importance of the certificate of origin, there is evidence that these documents, and also forest-use permits, are regularly being misused (Chapter 3).

Certificates of origin are not issued for off-cuts or wood chips, but in recent years some transporters of scrap wood have had their loads seized on the grounds that no certificate of origin could be produced. As businesses can only use the certificate of origin to sell finished timber, large quantities of off-cuts are discarded as unusable waste, despite the utility of this biomass for fuel supplies.

Permits for Private Use Timber and Fuelwood

In rural forested areas, permits can be issued allowing the holder to cut about 30 m^3 of timber for the construction of a private house, or a varying amount of fuelwood—issued in quantities of 2, 4, 6, or up to 12 m^3, depending on the soum. The numbers for fuelwood have recently been revised downward from figures of 8–30 m^3, recognizing that these were too high for the purposes required, in an attempt to regulate unsustainable use. If more fuelwood is required, more than one permit can be issued. Permits are usually only available to rural residents, following payment to the forest ranger responsible for the area from which the timber is to be cut. The permits for cutting timber for house construction are not issued in large numbers, and once a family has received a permit, they will not be eligible for another for a number of years. The fuelwood permit must be shown to bring the fuelwood into a city. It is often used repeatedly—although it shows the allowed quantity of timber on it, it is not marked when inspected. The governors of some soums refuse to authorize urban

[6] A company wishing to harvest timber in more than one aimag need only submit one application. MNE would specify on the permit the amount of timber that could be harvested in each aimag.

residents from the aimag centers to cut fuelwood, but insist on supplying only local residents.

The issue of fuelwood supply to urban areas is currently being overlooked; there is an absence of any policy, production and distribution system, or organization responsible for the supply of fuelwood to the capital city or other parts of the country. While there was also no official plan concerning fuelwood production prior to the 1990s, fuelwood supply and distribution were well-organized according to a functioning system. Policy was focused on using off-cuts from timber production as firewood, making the most efficient use of resources and channeling fuel to where it was required. A Fuelwood Agency employing 60 to 70 people used to be responsible for meeting the fuelwood demands of Ulaanbaatar, supplying 150,000 to 200,000 m^3 of wood annually. Timber was obtained from various regions in Tuv aimag, as well as from the green areas under the jurisdiction of the municipality—Ulaistai, Terelj, and Tuul. To supply the aimags of the Gobi region, which have no timber resources of their own beyond the extremely limited saxaul shrub forests, a central fuelwood shipping and distribution point was established at Choir. The organized supply of fuelwood to the capital city stopped in 1990. Up until three or four years ago, large enterprises such as Mongolian Railways, military units, and Monrostsvetmet[7] would order and prepare fuelwood in bulk for distribution to their employees. The only body that still prepares fuelwood today is the Municipal Care Organization, which prepares 10,000 m^3 of fuelwood annually and distributes 2 m^3 loads to the elderly and to impoverished families.

Permits to cut timber for the production of private-use timber are not granted to inner-city residents of Ulaanbaatar because there is no local area from which wood can be cut; instead, residents must buy their timber and fuelwood from individual traders or from the wood markets. MNE sets relatively higher limits for

[7] A joint Mongolian-Russian mining company.

Fuelwood on sale in a residential area on the outskirts of Ulaanbaatar. Image: Bryony Morgan, May 2006.

fuelwood preparation in the soums of Tuv and Selenge aimag near Ulaanbaatar, in an attempt to meet the city's fuelwood demands by allocating approximately 80,000 m^3 of timber annually for this purpose. The Office of the Environment of Ulaanbaatar City grants a limited number of permits to households in the green areas of the municipality to cut 2 m^3 of timber for fuelwood each year, but residents of the city itself are not eligible. Therefore they are forced either to purchase wood from markets at a high price or to cut wood illegally. As a result, many people do not view cutting timber from the mountainside for their own private use as theft.

2. Wood Consumption

Since the collapse of the centralized economy, no institution has assessed and categorized overall timber demand or consumption in Mongolia. Statistics are of poor quality, and are often found to change. To produce an estimate of consumption for this report, we compared available "current" data with previous statistics, and held additional consultations with relevant officials.

Table 2. Estimated Annual Wood Consumption by Category (million m^3)[8]

Fuelwood	0.6– 4.38
Private-use timber	0.59
Industrial timber	0.54
Total:	**1.74–5.51**

National Timber Consumption

Total annual timber consumption in Mongolia seems to be within the range of 1.74 to 5.5 million m^3; actual consumption is probably toward the upper end of this scale. This large variation is due in particular to disagreement over national fuelwood consumption, with estimates differing widely (Table 2).

It should be noted that the upper end of this estimate—5.5 million m^3—is significantly higher than estimates that have been produced in previous years; for example, 1 to 3 million m^3 in the *Mongolia Forestry Sector Review* (Crisp et al., 2004). This is in large part due to the figures for annual fuelwood consumption produced by the National Statistical Office (NSO) in 2004, which based calculations on a higher annual household consumption than previously used in estimates (see section below on fuelwood for discussion). Demand for timber for use in construction is also thought to be growing, in large part due to the number of people migrating to Ulaanbaatar and widespread construction of wooden houses.

"Industrial" and "private-use" timber are differentiated not by the end-user of the wood, but by the manner in which the wood is processed. For example, the wood used to produce ger[9] frames and furniture is considered industrial timber, as the timber is processed in commercial workshops. The timber cut and prepared by families for use in constructing private fences and homes, on the other hand, is classified as private-use timber, since it is not industrially processed.

No accurate figures exist on the proportion of the total wood consumed that enters market circulation. During the course of this research, we formed opinions on the volume of wood entering trade, based on the likelihood of the end-users in different regions buying timber versus directly obtaining their

8 Private-use and industrial timber consumption are not expressed in roundwood equivalents, and actual consumption in these categories will therefore be higher than stated.

9 Traditional Mongolian tents.

own supplies. The authors assumed that all industrial timber in Mongolia reaches its end-user after having been sold at least once. In addition, the results of the survey of khoroo governors (Figure 4) revealed that the vast majority of fuelwood in Ulaanbaatar is traded, although a small proportion of residents will endeavor to cut their own supplies directly, and the poorest households that cannot afford to buy supplies will obtain fuelwood from a number of sources. The same is likely to be true for private-use timber. In other parts of Mongolia, nomadic families and households in soum centers prepare much of the fuelwood and timber for construction on their own—perhaps 10–15 percent of private-use timber might be traded, and 35 percent of fuelwood.

Timber harvesting occurs year round, but reaches its peak in August and again just before and after the traditional Lunar New Year, as people cut timber from the mountains in order to generate extra income to pay for their children's school tuition, their family's winter food reserves, or New Year celebrations. The timber price goes down during these periods, reaching its lowest point at the Ulaanbaatar timber markets just before the traditional Lunar New Year celebration.

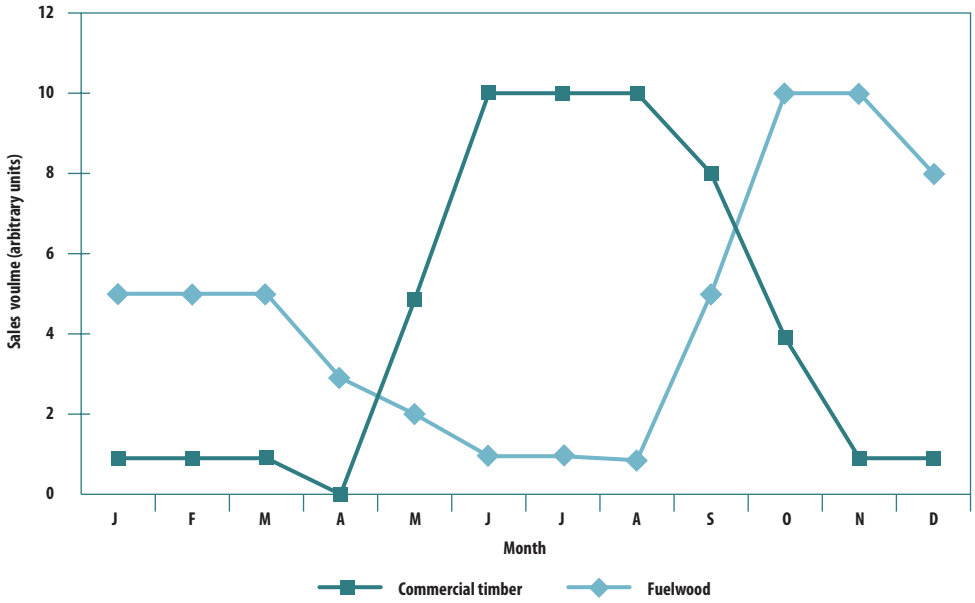
Poor families cut and sell wood as a means of earning money to cover for occasional or unexpected needs, such as medical expenses, a funeral, or the construction of a home.

In Ulaanbaatar, the peak consumption period for private-use timber is during the four summer months, when the majority of construction occurs, while the peak season for fuelwood consumption corresponds to the four winter months. Peak sales occur just ahead of these periods, as illustrated in Figure 2.

Industrial Timber

In order to assess the actual consumption of industrial timber, data were sought from a variety of sources, including statistics on the production of timber and wood products compiled by the NSO; information concerning the proportion of wood entering Ulaanbaatar and sold on the market as industrial timber; and details of the AAC allocated by MNE for the preparation of industrial timber. Faced with considerable irregularities in the official records, we obtained an informal assessment from a senior specialist from MIT (600,000 m^3 per annum, Box 2) and from the (former) Water, Forest and Natural

Figure 2. Illustration of Estimated Relative Sales Volume of Wood by Month



'Commercial timber' refers to both industrial and private-use wood.

Box 2. An Estimate of Industrial Timber Consumption (Sawn-wood)

"First, our country used to prepare two million cubic meters of industrial timber annually during the socialist era. Then as now, the main consumer of industrial timber was the construction sector, and in recent years this sector has been booming, reaching the former peak levels it attained during the socialist era. These two million cubic meters of timber were mostly ordered by our ministry and used for industrial purposes. Although there is documentation concerning apparent timber exports to Russia, in reality that timber was used for the construction of buildings built in Mongolia with the assistance of the Russians. The timber was recorded as "exports" because it was paid for by the Russians, but the timber was never sent to Russia; it was used in the construction sites of Ulaanbaatar's micro-districts.

"Secondly, the Ministry of Industry and Trade receives applications from companies asking for permits to harvest timber, totalling about 150,000 m^3 a year. However, these applications come only from those companies that have registered with our ministry. There are also many companies that are not registered with us, companies that are not aware of the registration process, and companies that are aware of the process but do not apply to the ministry because they know that in any case they are unlikely to obtain a license for the amount for which they apply.

"The number of applications has been decreasing in recent years. Applications are submitted only for the sake of getting one's name in the list of allocations, with the expectation that most of the actual harvest volume will be logged illegally. With this current situation, the amount applied for, 150,000 m^3, is several times less than the actual demand.

"In addition, the lifestyles and living standards of the Mongolians are changing. People are building more private homes, doing repairs, and purchasing more home furniture. As their living conditions improve, they prefer to buy wooden products.

"Based on these various factors, I conclude that the minimum national demand for industrial timber is 600,000 m^3."

Source: Senior forestry specialist, MIT

Resources Agency[10] (500,000–600,000 m^3 per annum). These estimates were verified by surveying companies in the timber processing industry. There is good evidence that the national yearly consumption of industrial timber is at least 540,000 m^3. This figure is for sawn-wood. The harvest of roundwood would be much higher—the *Mongolia Forestry Sector Review* (Crisp et al., 2004) estimated a recovery rate of 40 per cent. Consumption of industrial sawn-wood in the Mongolia Forestry Sector Review is given as 135,000 to 400,000 m^3 annually.[11] These new estimates suggest that these figures may have been on the low side.

Efforts were made in this study to establish the timber consumption by companies in the wood processing industry. There was a discrepancy among figures concerning the actual number of companies operating in the forestry sector nationwide (Table 3). The figures from the National Taxation Authority were considered to be the most reliable of the three, as the tax records showed that these companies were all active, paying taxes varying from 1,000 Tg to 211 million Tg in cumulative tax as of the first half of 2004. The figures categorized a total of 678 companies as follows:

[10] Now named the Forest and Water Research Center.

[11] At a recovery rate of 40 percent this translates into a roundwood harvest of between 340,000 and 1 million m^3. The *Mongolia Forestry Sector Review* (Crisp et al., 2004) did not distinguish between private use and industrial timber.

- Producers of construction materials and components (175)
- Producers of other wooden and woven products (207)
- Producers of wooden panels (48)
- Producers of wooden crates and containers (36)
- Producers of timber (123)
- Logging companies (89)

After excluding the logging companies from this list, the remaining 589 manufacturers of finished products were divided into three groups, according to the quantity of their registered capital (see Appendix B and Table 4). Representatives of ten or more companies from each group were interviewed to obtain figures for their annual timber consumption. The companies selected for interview were spread among the different categories[12] within each group; the timber consumption quoted by the different company types were comparable. Therefore, it was decided to calculate the mean timber consumption for each group and use this to estimate total consumption by the wood processing industry.

These calculations produced an estimate of 582,900 m^3 timber consumed annually by the 589 forestry product manufacturers in Mongolia. However, as there is some overlap between the consumption figures for companies producing timber and manufacturers of finished products, a more conservative estimate was derived by deducting 50 percent of the total consumption of the companies producing sawn timber, equivalent to about 46,500 m^3. This resulted in a revised estimate of 536,400 m^3 of industrial timber consumed annually. As the raw materials for all companies except those producing timber would be sawn-wood, not roundwood, the total volume of roundwood consumed annually by these companies would be expected to be considerably higher.

The survey revealed that the processors are consuming volumes of timber orders of magnitude higher than the AAC set by MNE, which in 2006 was 32,500 m^3. This was revealed openly by the companies. It should also be noted that many of these manufacturing businesses are currently operating below capacity, predominantly due to the lack of raw material, or by naively overestimating the sustainable supply, as has happened in many other parts of the world. If licensing were unrestricted and timber more readily available, these companies would have the capacity to process nearly 1.2 million m^3 of timber annually.

Private-Use Timber

The nationwide private consumption of timber was calculated separately for Ulaanbaatar and for the rest of Mongolia. Rural timber consumption is estimated to be 75,000 m^3 per annum (Table 5). Adding the Ulaanbaatar private timber consumption of 450,000 m^3 (Table 8 and following text) brings the estimate for the annual nationwide demand for private-use timber to about 525,000 m^3. In Ulaanbaatar and in some of the larger aimag capitals, a certain percentage of newly built houses are constructed using industrially processed timber. Therefore, there may be some overlap between this category and the industrial timber category—perhaps 30

[12] Although the companies were officially registered in one of the six categories, most produced goods in more than one category and there was therefore less difference between the companies' annual timber consumption than may otherwise be expected.

Table 3. Number of Companies Operating in the Forestry Sector (June 2004)

	Source		
	Ministry of Industry and Trade	National Statistics Office	National Taxation Authority
Rural	90	131	406
Ulaanbaatar	66	61	272
Total	156	192	678

Table 4: Timber Demands of Forestry Product Manufacturers (June 2004)

Companies by registered capital	Number of companies	Present annual timber consumption (m^3)		Maximum processing capacity (m^3)	
		Per company	Total	Per company	Total
Up to 10 million Tg	279	300	83,700	500	139,500
10 to 50 million Tg	241	1,200	289,200	2,500	602,500
Over 50 million Tg	70	3,000	210,000	6,000	420,000
Total	589		582,900		1,162,000

Large amounts of high-quality timber are available to supply the wood processing industry. Image: Bryony Morgan, May 2006.

Table 5. Annual Nationwide Demand For Private-Use Timber (excluding Ulaanbaatar)

Form of private timber use		Number of units	Timber volume required per unit (m^3)	Total timber volume (m^3)
Private house construction[a] (6x8 m)		591	19.2	11,347
Fence construction		1,970	8	15,760
Sheds, storehouses, etc. (3x4 m)		1,970	3.0	5,910
Outhouses (2x2 m)		1,970	0.9	1,773
Enclosed livestock pens[b]	New	766	9.8	7,507
	Repairs	3,675	6.6	24,255
Unenclosed livestock pens	New	733	3.4	2,492
	Repairs	3,310	1.7	5,627
	Total			74,671[c]

a. To estimate the number of new private houses built each year, we assumed that 30 percent of the households receiving land permits in a particular year would build new houses. We obtained the number of issued land permits from the State Cadastral Department. We also assumed that all households that received a land use permit would construct a wooden fence surrounding the property, a shed, and an outhouse. The average size of the lots was estimated as 20×20 meters.

b. To estimate the number of new livestock pens, we used the average annual nationwide increase in the number of livestock pens based on data from the last three years (Statistical Bulletin, 2003, National Statistical Office). To estimate the number of livestock pens that would be repaired, we assumed an annual repair rate of 10 percent for all unenclosed pens and 5 percent for all enclosed pens. The quantity of timber required for the construction of pens was calculated with the help of a livestock-owning forest ranger (see Appendix C).

c. Insofar as this estimate is based on official data alone, it is considered to be lower than the actual figure due to the relatively common practice of constructing houses and fences without official land permits in rural areas. Lately, many households have been migrating from the countryside toward aimag centers, creating small neighborhoods grouped by their native soums. Most of these migrants do not obtain proper land permits and settle in locations without electricity or water.

percent of the volume calculated for private-use timber in Ulaanbaatar. This was not included in the calculations due to the lack of reliable information—the calculations in this category are considered conservative in any case due to the large numbers of families constructing houses and fences without permits. Industrially processed timber is also used for windows, doorframes, staircases, and other parts of the house requiring a higher quality finish; this is not included in the calculations below.

Another use of timber—not included in this assessment—is the use of smaller-sized trees as mining props and lately as scaffolding in the construction of molded concrete buildings. As these trees are not processed by sawmills but are brought directly by traders to the mining and construction sites, the quantity of such wood is not included in any compiled data or reports. It is difficult to assess how many smaller-sized trees are being used, but approximately 500 logs, each 2.60–2.80 m long, are used to construct a five-story building—equivalent to about 30 m^3 of timber. Builders prefer to use freshly cut poles as scaffolding, but once they can no longer be used for this purpose they will be used in domestic construction or as fuelwood.

Fuelwood

Domestic fuelwood consumption has been estimated in a number of other studies. The Household Living Standards division of the NSO estimated demand in 2004 at 4.6–4.7 million m^3; the World Bank's *Mongolic Forestry Sector Review* in 2004 quoted various estimates of between 0.6–2.3 million m^3; and the UNDP in 2002 estimated demand at 1.3–1.5 million m^3 (*Report on the Project to Develop Forestry Policy and Programmes*). Fuelwood may have been

Poles being used in construction on a building next to the State Department Store, Ulaanbaatar. Image: Bryony Morgan, May 2006

substantially underestimated in studies prior to the NSO, due to the lack of data on consumption in areas outside Ulaanbaatar. It was not possible to critique the calculations performed by the NSO, nor to verify the figures through assessments in the field; the range of estimates is included in the report. Table 6 shows the calculation of the higher end of the range, with figures for Ulaanbaatar taken from a World Bank report, and figures for other parts of Mongolia taken from those produced by the NSO. These were the figures that most closely matched those produced by households in surveys based on recall; however, this method is intrinsically unreliable.

Households in urban areas increase their consumption of fuelwood in winter, while households in rural areas increase their fuel consumption in the summer months due to their seasonal processing of traditional dairy products. A more detailed analysis would show that consumption by households is higher in forested steppe areas than in the arid Gobi; these differences were taken into account in the calculations by the NSO.

Ulaanbaatar Timber Consumption

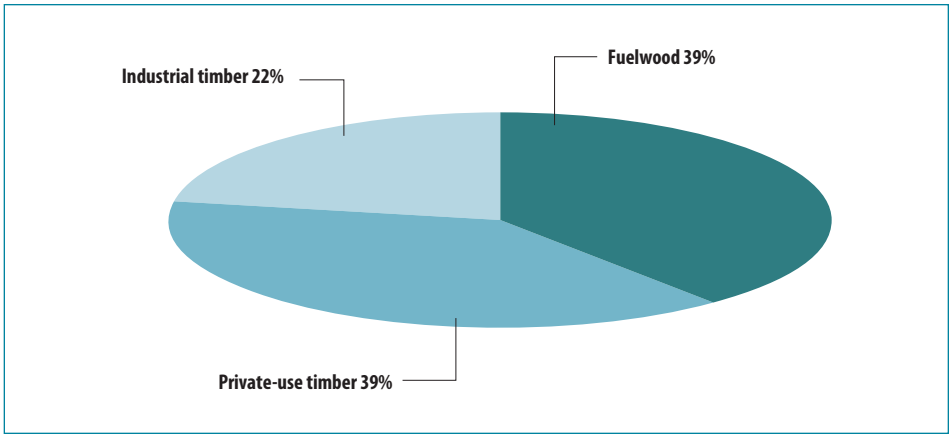
As there was no means of accurately determining the types and quantities of wood sold in Ulaanbaatar, sales volumes were calculated indirectly through an analysis of timber consumption. According to this estimate, total wood consumption in Ulaanbaatar amounts to approximately 1.16 million m^3 annually. The estimated consumption of fuelwood and private-use timber is calculated as equal, with each category making up 39 percent of the total, while industrial timber consumption is roughly half that of the other two categories, at 22 percent (Figure 3).

Table 6. National Fuelwood Demand (m^3)

	Number of households[a] using fuelwood (as of 2002)	Annual consumption per household[b] (m^3)	Total consumption (million m^3)
Ulaanbaatar	99,000	4.7[c]	0.46
Aimag centers	135,400	10.4	1.40
Soum centers	85,288	12.9	1.10
Countryside	159,877	8.8[d]	1.40
Total	479,565	9.2 (average)	4.38

a. The number of households using fuelwood was obtained from the National Statistical Office (NSO).
b. Annual consumption per household was taken as the lower of the two sets of figures produced by the NSO, reflecting the number of households that use fuelwood and the distribution of firewood use among all households. The estimates of annual household consumption were verified by surveying residents from the different categories at terminal bus stations in Ulaanbaatar; however, surveys based on recall are inherently unreliable.
c. Annual consumption in Ulaanbaatar is lower than other categories, since many households use a mixture of wood, coal, and electricity for their energy supplies. This figure is taken from the World Bank Monitor (2004), which was closer to the survey results.
d. Annual consumption in the countryside is lower than in the aimag and soum centers, as herders also use dried animal dung.

Figure 3. Annual Consumption of Wood in Ulaanbaatar



While it is considerably easier to calculate consumption for Ulaanbaatar than for the rest of the country, the large proportion of informal and unregistered activities in the city presents a challenge. Based on a survey of khoroo governors[13], it was estimated that there are 336 families in Ulaanbaatar that privately saw timber they cut themselves from the surrounding mountains. In addition, there are 1069 families that cut, chop and sell timber as fuelwood. There are also 2690 household businesses that purchase wood in bulk and resell it in smaller quantities. In addition, it should be noted that a significant number of individuals manufacture wooden products at home, without a registered business, and sell their goods at the Zuun Ail and Narantuul markets. Such products are not included in any wood consumption category.

[13] A survey was conducted by questionnaire among 77 governors of the 121 khoroo (urban sub-districts) in nine duureg (districts) of Ulaanbaatar, to assess the usage of fuelwood and commercial and household timber.

Table 7: Annual Consumption by the Timber Processing Industries in Ulaanbaatar (data collected June 2004)

	Number of timber and wood product manufacturers in Ulaanbaatar	Present timber usage volume per year (m^3)		Maximum processing capacity (m^3)	
		Per company	Total	Per company	Total
Up to 10 million Tg in registered capital	116	300	34,800	500	58,000
10 to 50 million Tg in registered capital	98	1,200	117,600	2,500	245,000
Over 50 million Tg in registered capital	37	3,000	111,000	6,000	222,000
Total	251		263,400		525,000

Industrial Timber

Calculations of the timber consumption of Ulaanbaatar's wood processing industry were made by surveying companies; a subset of the data collected for the calculations of national industrial demand. There are currently 251 companies and two NGOs registered in Ulaanbaatar as timber and wood product manufacturers (Table 7), representing 37 percent of Mongolia's forestry companies and processing approximately 48 percent of the nation's industrial timber. The mills in Ulaanbaatar are usually large and have comparatively large capacities, with an annual consumption estimated[14] as 256,000 m^3. Many companies locate their mills in rural areas because of the advantages conferred by proximity to raw materials, ease of tax evasion, and lower chance of inspections. Therefore, it can be assumed that Ulaanbaatar is actually the main consumer of industrial timber from these rural mills although it was not possible to demonstrate this empirically.

Private-Use Timber

Most of the private-use timber in Ulaanbaatar is used in the construction of private houses, various types of fences—for homes, office buildings, and livestock—as well as sheds and outhouses. There are no reliable data on the number of private homes and summerhouses being built in Ulaanbaatar. The District Land Units were consulted to determine the number of land permits issued by the district administrations to citizens wishing to construct private houses and summer residences. As of 2003, land permits had been issued to a total of 6,381 households from nine districts.

Most of the private homes built in ger districts in Ulaanbaatar are one-story buildings with an average floor area of 6×8 m. Residents who build summerhouses are generally wealthier, and therefore typically construct two-story houses that are typically 10×12 m in area, situated on relatively larger lots. All lots are usually surrounded by fences, which tend to be very roughly sawn, making use of off-cuts and bark. Not all households in possession of land permits are actually able to construct private homes, but single lots are often used for the construction of several residences—particularly in the case of summerhouses—and therefore it was assumed that on average it was possible to take the number of land permits issued as roughly equal to the number of new houses. Based on calculations of the volume of timber, we estimated that an average of 287,800 m^3 of wood is used annually by Ulaanbaatar residents for private purposes (Table 8).

[14] In the same way as was calculated for the national timber consumption, 50 percent of the consumption of the companies producing sawn timber in Ulaanbaatar (7,500 m^3) was subtracted from the total consumption calculated for Ulaanbaatar.

Table 8. Annual Private-Use Timber Consumption in Ulaanbaatar (2003)

Form of use	Quantity	Timber requirement for each unit constructed (m^3)[a]	Total volume of timber (m^3)
New house in ger district	5,305	19.2	101,856
New summerhouse	2,153	55.15	118,738
New fence[b]	7,458	8	59,664
New outhouse[c]	8,380	0.9	7,542
Total			287,800

a The volume of timber required for the building of a private house was based on calculations by the Industry and Service Department of the Municipality of Ulaanbaatar and engineers from the Ulaanbaatar Urban Services Improvement Project (USIP) (see Appendix C).
b We estimated that 90 percent of those who received land permits would build fences surrounding their lots, measuring on average 20×20 m.
c We estimated that all households that received land permits for the construction of private houses in ger areas—and 70 percent of households that received land permits for summer occupancy—would build wooden outhouses in any given year.

In addition, large numbers of families migrating to Ulaanbaatar from rural areas have constructed fences and houses without official land permits. The land use inspection conducted by the Ulaanbaatar City Land Unit in October 2004 revealed that 6,000 households had already built fences without permits in the previous 15 months. Authorities are now discussing the possibility of issuing *post hoc* land permits for 4,000 of

Houses and gers on the outskirts of Ulaanbaatar; plots are separated by roughly sawn fences. Image: Bryony Morgan, 2006.

Woman cutting fuelwood for sale at an Ulaanbaatar timber market. Image: Bryony Morgan, May 2006.

these 6,000 households. It was estimated that at least 162,000 m^3 of wood must have been used to build fences and houses in these unauthorized settlements. From this it was concluded that the annual consumption of private-use timber in Ulaanbaatar must be at least 450,000 m^3. As this figure refers to sawn timber, a considerably greater volume of raw timber must be cut from the forest to obtain this amount.

The consumption of private-use timber in Ulaanbaatar was higher than expected. Government officers were unaware of the high demand; some even believed that the total consumption amounted only to 39,000 m^3, the limit for production of sawn-wood established by MNE in 2005.[15] However, timber traders and forestry industry businessmen believed that the figure of 450,000 m^3 could easily be true, since timber flows into the city almost around the clock every day of the year.

Fuelwood

Due to the high rates of migration to Ulaanbaatar, and the fact that many of these families were not yet officially registered, it proved difficult to obtain an accurate figure of the number of households using fuelwood in the capital. However, the different institutions consulted did provide broadly concurrent figures concerning the official number of households heating their homes with stoves burning solid fuels. The Ulaanbaatar Statistical Office reported 99,747 households, and MNE reported 99,000 households using such stoves at the end of 2003. The survey of khoroo governors calculated 98,995 officially registered households using fuelwood in Ulaanbaatar, in addition to an undetermined number of unregistered

15 This limit was entirely allocated to industrial sawn timber in 2005; no allocation was made for private-use timber.

households, likely numbering into the thousands in each district. For this report, we assumed that 99,000 households were using fuelwood.

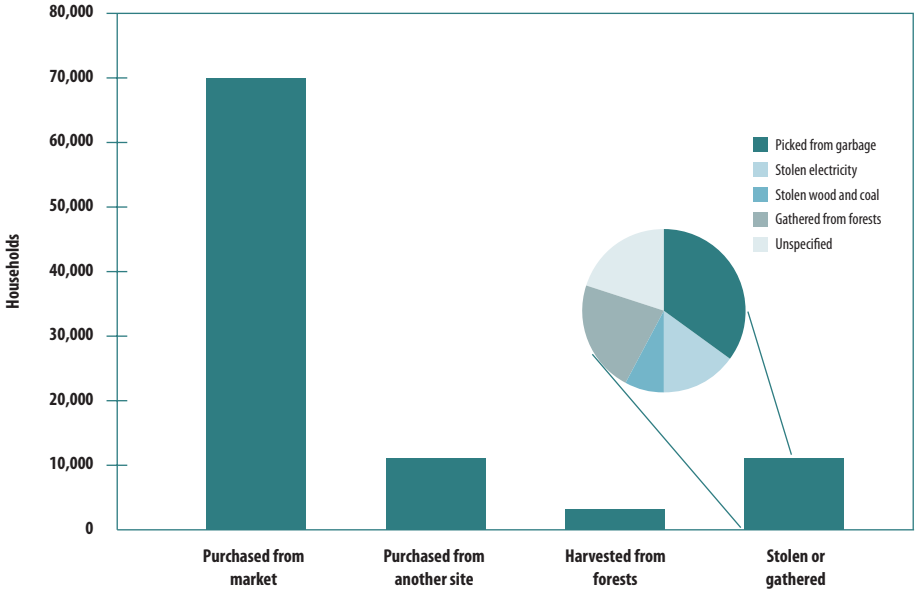
The annual average fuelwood consumption per household has been variously reported as 8.2 m^3 (NSO), 3 m^3 (Improved Stoves Project), 4 m^3 (MNE), and 4.7 m^3 (World Bank, 2004). The last of these estimates was considered to be the most reliable and was used in these calculations. The figure was verified by surveying residents at four bus stations in ger districts of Ulaanbaatar, which produced a similar estimate. Multiplying the total number of households using fuelwood by the annual average household fuelwood consumption, we calculated an estimated annual fuelwood consumption of 465,300 m^3 for Ulaanbaatar. Although some company guard posts, kiosks in ger districts, and offices in the outskirts of the city also use fuelwood, these are relatively minor and were excluded from the present calculations.

The survey of khoroo governors was also used to estimate the sources of fuelwood used in Ulaanbaatar (Figure 4). The respondents listed the primary source for households; in reality, households will often obtain fuelwood from more than one source. The survey divided households into four main categories, including those who:

- bought their fuelwood from the market;
- bought their fuelwood from other sites;
- were able to purchase fuelwood, but instead chose to harvest timber;
- were too poor to purchase fuelwood, and instead relied on stealing or gathering scraps of fuelwood.

This last category—the poorest households—was broken down further into subcategories by the respondents (Figure 4). In addition to these primary sources of fuelwood, an important secondary source

Figure 4. Sources of Fuelwood in Ulaanbaatar



Figures refer to the number of households, as estimated by khoroo govenors. Total number of households listed here is 98,884; total number of registered households using fuelwood in Ulaanbaatar according to the survey is 98,995. It should be noted that although households were assigned to one category primarily, in reality they will use a mixture of sources. A secondary source of fuelwood for many poor families that cannot afford to buy supplies (stolen or gathered category) is from charity. The survey estimated that 7,648 of these households received donations, which are usually only 2m^3 and therefore must be supplemented from another source. The category "stolen electricity" refers to the number of households currently thought to rely on stolen electricity. As the electricity companies are currently tightening controls over theft, these households will be forced to use fuelwood in the near future and are therefore included in the graph.

of fuel for the poorest households is from charities such as the Municipal Care Organisation—donations of 2 m^3 of fuelwood were given to an estimated 7,648 households in 2004. This amount is not sufficient to meet a household's annual consumption, and therefore these households will also rely on other sources.

This survey showed that the vast majority of fuelwood was thought to be traded in some way before reaching residents (approximately 84 percent of households primarily purchased their supplies). However, a significant number of households were thought to harvest their own supplies directly; these families would be relatively well off and would own basic equipment and vehicles to allow them to exploit the lack of control over the forests surrounding Ulaanbaatar by harvesting timber. This category differs from those in the subcategory of the poorest households, who also gather fuelwood from the surrounding forests, as these households lack equipment and transport and typically gather smaller branches and scraps to carry down on foot.

Influences on Timber Consumption

In recent years the demand for timber, particularly for industrial and private timber, has been increasing rapidly, and it seems likely this will continue. Possible reasons for this are given below.

Land Privatization

Currently the fastest growing area of consumption in the capital city is for private-use timber, largely as a result of land privatization. Since the Land Privatization Law entitled households to own the land they occupied, it has become common for people to develop their residential lots by building new fences and houses, or settle in new lots. This trend is likely to increase significantly if entitlement to land ownership is eventually extended not only to households but also to individuals—as promised during the parliamentary election campaign of the party currently in power. Although the Land Privatization Law also applies to rural areas, there has been little increase in fence

Land privatization and urban migration are resulting in fences appearing all over Mongolia, such as in this residential area on the outskirts of Ulaanbaatar. Image: Bryony Morgan, May 2006.

building in these areas to date, as land is readily available, people generally are poorer and lack the resources to pay for new houses or fences, and there is no real need to keep others out of their land.

Migration to Ulaanbaatar

Many thousands of households have been moving from rural areas to Ulaanbaatar, increasing the demand for all categories of wood. The study *Urban Poverty of Ulaanbaatar and Migration* (UNDP, 2004) concluded that this migration trend may continue on a major scale into the future. The majority of migrants construct wooden houses heated with stoves burning solid fuel as soon as they have the resources to do so, as construction materials are abundant and inexpensive in Ulaanbaatar.

Growth in the Forestry Industry

Production and sale of timber and wood products are increasing steadily, with increases of 62 percent in production between 2000 and 2003 (MIT, 2003). There has also been a rapid increase in the number of small and medium-sized enterprises working in the timber and wood products sector; in Ulaanbaatar alone, numbers rose from 92 at the beginning of 2000 to 196 in 2002, and then to 270 by June 2004 (Table 9).

A June 2004 survey conducted by MIT, involving 40 large timber mills and wood product manufacturers, found that such companies were operating at only 35–40 percent of their total capacities, and hoped to increase their production to 75 percent of total capacity by the year 2015. The mills are currently limited by availability of timber, and the predicted increase in demand could only be met by a further increase in illegal and unsustainable logging, or, if illegal and unsustainable logging is curtailed and a reasonable (non-distorted) price structure emerges, by increasing use of imported roundwood from Russia. This would, of course, be more expensive and should force some efficiencies in wood use.

Growth of the Construction Sector

The construction sector, Mongolia's main consumer of industrial timber, is one of the most rapidly developing sectors of the domestic economy (Table 10). This

Table 9. Trends in the Number of Timber Mills and Wood Product Manufacturers, 2000–04

Number of timber mills and wood product manufacturers	2000	2001	2002	2003	2004
Nationally	355	420	518	646	678
Ulaanbaatar	92	117	196	258	270

Source: National Taxation Office

Table 10. Contribution to GDP by the Construction Sector (million Tg)

	1995	2000	2001	2002	2003	Increase from 2000 to 2003 (percent)
Unadjusted value	9,237.0	24,631.7	32,955.3	4,6812.1	48,637.7	198
Value at 1995 prices	9,237.0	7,915.9	8,772.8	10,399.2	11,713.1	148

Source: Statistical Yearbook, NSO 2004

sector was forecast to grow at a continuing annual rate of 7–8 percent (*Economic Growth Support and Poverty Reduction Strategy*, Government of Mongolia, 2003). With the introduction of new building technologies such as poured-concrete buildings in recent years, large numbers of pole-sized trees are being used in construction.

Changes in the Standard of Living

The transition to a free-market economy has resulted in rising incomes for some and changes in patterns of consumption. Mongolians want to improve and enlarge their homes, or to construct secondary residences; they also want to use natural wooden products to the greatest extent possible, as these are considered healthier. High levels of air pollution in Ulaanbaatar are encouraging more people to build homes in suburban areas.

A variety of different types of building are appearing in Ulaanbaatar; the construction sector is booming. Image: Bryony Morgan, May 2006.

3. Illegal Timber Harvest and Trade

The commercial illegal wood business has a well-organized structure, specialized workforce, contacts in government and legal institutions, and networks at all levels that extend from harvest to transport to Ulaanbaatar and sale to end-users. There seems little dispute that most of the approximately 1.2 million m^3 of wood consumed annually in Ulaanbaatar is supplied through illegal logging. This is known to public servants at all levels, including high-ranking officials of MNE, and is also readily accepted by those who work in the timber business. In other words, this is a complete and independent sub-industry within the forestry sector.

Organization of the Illegal Timber Trade

The illegal harvesting sites, logging methods, and composition of the workforce are evolving from year to year. Recently, the illegal timber industry has changed dramatically and illegal loggers have become more professional and more powerful, with an expanding reach. Timber traders and inspectors agree that since 2002 the number of people involved in the illegal timber trade and the quantities of bribes have risen sharply. The recent intensification of inspections and controls by MNE has resulted in small-scale traders without contacts being essentially forced out, and large-scale traders and groups with many powerful contacts or significant financial resources now making up the majority of the business. The broadening availability of mobile phone service in Mongolia has also contributed to the development and sophistication of illegal logging activities.

Illegal logging is conducted either by organized networks of people, or by independent groups. An organized network usually involves a manager who takes all the (minimal) risks and almost all of the profits, paying set wages to contract workers. Where the different stages in the illegal forestry operation are conducted by unrelated groups, the risk is shared and so are the profits.

Logging Sites

Industrial timber. In addition to improving their techniques, illegal loggers are also changing their locations. Whereas illegal logging formerly occurred mostly in the northern soums of Selenge aimag, currently it is taking place nearer to Ulaanbaatar—in the southern soums of Selenge aimag (Zuun Kharaa, Tunkhel, Altanbulag and Zuunburen and the villages of Bulgant and Tunkhel), Tuv aimag (Jargalant, Bor Nuur, Erdene, Batsumber, and Mungunmorit) and elsewhere (Figure 5).

One of the reasons why illegal logging for timber may have shifted closer to Ulaanbaatar is that inspections throughout the country have been tightened recently. Transporting timber over long distances increases the chance of an inspection, and the associated costs and risks of fines or bribes. As a result, areas close to the city—such as Udleg, Bayangol, Gunt, Terelj, and Gatsuurt—are becoming popular sites for illegal

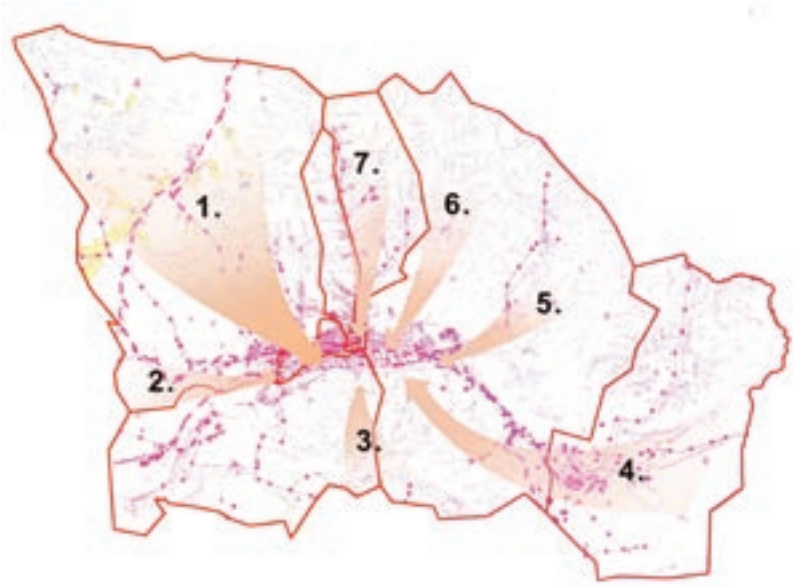
logging. Researchers for this report participated in a night patrol conducted by the officers of SSIA to Ar Gunt, located 28 km from the capital, where eight people were found cutting trees; they had already loaded five trucks with timber. This was one of three large groups of illegal loggers known to be operating to the west of the capital. The largest illegal logging groups have gone so far as to declare some mountain valleys as their own territory, blocking the entry of other illegal operations.

This shift to sites near Ulaanbaatar is likely to be temporary as the forests in Selenge and around Ulaanbaatar become depleted and controls are tightened. Some illegal loggers are now in fact moving farther afield to aimags such as Khuvsgul, Khentii, and Arkhangai.

Fuelwood and private-use timber: The forested areas under the jurisdiction of Ulaanbaatar City (namely Ar Gunt, Gatsuurt, Uliastai and Terelj) contain 266,900 ha of forest, or 1.3 percent of Mongolia's total forest area. Most of the fuelwood consumed in Ulaanbaatar is obtained from this small area, as the economics of fuelwood supply do not allow for high transport costs. Fuelwood is usually cut only 20–70 km from the point of sale, but is occasionally transported from more distant locations—such as Arkhangai and Khuvsgul aimags—by trucks that would otherwise be empty on the return journey to Ulaanbaatar. They carry fuelwood to subsidize their petrol costs, or as shipments to students and children living in the city. As fuelwood is indispensable for cooking and household heating, its consumption cannot be limited by laws or regulations; the quantity of fuelwood entering Ulaanbaatar can be determined only by demand.

Although the demand for fuelwood is relatively high in Ulaanbaatar, its extraction from the surrounding forests is generally not too damaging because most of the trees taken are already dead and dried. Households do not buy green wood for fuel, as it burns poorly. A larger amount of damage is done by illegal loggers who cut timber to be sawn into planks, felling only the highest quality trees that can be easily cut with hand saws, and bringing them into Ulaanbaatar disguised as fuelwood. The activities of such loggers have denuded several valleys surrounding Ulaanbaatar city, including Baishint, Yargait, and Chingeltei. In the western part of Tolgoit alone there are between 150 and 200 people cutting wood at any given time. This situation is not sustainable in the long term, as the areas surrounding the city risk being devastated within a few years. To quote the director of one logging company, "*it's like a robbed home after the burglar has left*."

Figure 5. Sources of Timber Entering Ulaanbaatar



1—Jargalant, Bor Nuur, Batsumber, Partizan, Udleg. 2—Arkhangai, Khuvsgul, Jargalant. 3—Bogd Khan Mountain. 4—Tuv, Erdene, Khentii, Batshireet. 5—Gachuurt. 6—Uliastai. 7—Udleg, Bayan Gol, Gunt.

Transport of logs, Tunkhel. Image: Tony Whitten

Harvesting

The most demanding work is often conducted by the poorest people, including women and children, for the smallest gains. Local people work in teams of six to fell the trees—two people cutting the timber and two others stripping the branches from the logs, while the remaining two perform other jobs such as loading and unloading. A variety of techniques may be used to avoid detection (Box 3). The timber is purchased on-site by a separate group, moved to the foot of the hill, and sold to a sawmill. Only powerful trucks like the Russian "Ural 66," which consumes almost 100 liters of gasoline per 100 km, and some military vehicles are able to traverse the rough mountain roads. In Tunkhel village alone, there are 83 such trucks transporting timber. The local governor was able to show researchers the registration file of these trucks, complete with license plate numbers and drivers' names.

Milling

Before Transition, sawmills were located close to timber harvesting sites. As the former harvesting sites become depleted of trees, and inspections increase, sawmill operators are moving toward more remote, hidden locations. Sawmills have been found within private residential lots, in abandoned town sites, and in settlements far from forested areas. A considerable proportion of the timber sold in Ulaanbaatar arrives in the form of logs ostensibly intended as fuelwood, which are then cut and processed at secret locations or at the timber markets. Lately, people have obtained permits to establish sawmill facilities and fuelwood sales points in suburban districts, which they use to cut and sell illegally logged timber.

Three to five people operate a sawmill: two cut the timber, one removes the trimmings from either side of the board, and another cleans the sawdust. These are often former employees of state-owned sawmills, who obtained some capital following their privatization. At this stage, the timber is cut into different widths and sold to transporters. Many forest rangers and government officials believe that prohibiting the operation of sawmills would greatly contribute to stopping the illegal timber trade.

Box 3. Methods of Illegal Timber Harvest

Illegal loggers are becoming increasingly refined in their techniques; some of these are outlined below:

- People obtain permission to cut a fire break, to thin trees, or to clear undergrowth. This provides an easy, virtually risk-free, opportunity to illegally cut additional timber.
- Loggers enter the forest in a small vehicle, cut timber as quickly as possible, and then call for a truck to collect the logs. If questioned, they will claim to be vacationers. There have been reports of rangers being threatened with violence and therefore they may not be too keen to investigate further.
- Illegal loggers track the whereabouts of the local forest ranger who is typically responsible for a much larger area of forest than can be monitored effectively. An accomplice informs the loggers as soon as the ranger leaves his post, or may mislead the ranger with false information about illegal harvesting or a forest fire in another area to ensure that the loggers can fell trees undisturbed.
- During the day, trees are sawn part-way through until they can be felled with a single push. Even if a ranger should hear the noise of the chainsaws and come to investigate, the part-felled trees are difficult to find. The loggers return at night with their vehicle headlights off, knock down the trees, and load their truck.

- Logging camps are established deep in the forest, with a team of workers who live there permanently and are supplied by the trucks that collect the timber.
- Loggers cut large quantities of trees in the autumn, just before the snow falls. In spring, when the snow melts, the trees look as though they have been felled long ago. The loggers then inform the authorities that they have discovered an illegal logging operation and ask to collect the timber before the thieves return or the wood rots. To prevent wastage, the officials issue a permit to the loggers allowing them to recover the wood.
- Loggers superficially burn a stand of trees, then obtain a forest cleaning permit allowing them to recover the burnt timber for use as fuelwood. Although the scorched trees appear to be useless except for fuelwood, once the bark is stripped they can produce excellent timber. One advantage of this method is that inspection patrols are likely to ignore a truck full of burnt-looking logs, despite the absence of any documentation. Environmental sector staff have no firm evidence of this practice but are convinced that it has occurred, reporting that local residents know who has started fires and where, but do not report these incidents because they believe the government is unwilling to take action. This theory is supported by the large number of fires that occur in the forests near Ulaanbaatar: in 2003 more than half (20 out of 38) of all reported forest fires took place in territories of Selenge and Tuv aimags, situated closest to Ulaanbaatar (*Statistical Yearbook*, 2003, NSO).

Cartoons by Alan Hesse

Trees are often cut in the autumn before the snow falls, and then are claimed in spring. Image: Ya. Ariunzul, 2005.

Transporting of Timber

Timber can be transported to the city by rail or by road. Trucks enter Ulaanbaatar at night and make direct deliveries, if arrangements have already been made, or otherwise park out of sight near the timber market in order to sell the wood wholesale when the market opens in the morning. Until recently, the widely available old Russian trucks were most frequently used to transport timber, but the vehicles of choice for illegal wood traders have now become light, Korean-manufactured pickup trucks, enclosed delivery trucks, or even mini-vans, as these are less likely to attract attention. As the drivers of trucks carrying illegal cargo run a high risk of being caught by inspectors, and eventually being fined or even having their trucks and loads confiscated, they take a slightly higher percentage of the profits from the illegal operation. If the drivers have police contacts they can travel by paved roads, otherwise they must take longer routes over rough tracks.

There are four official and twelve unofficial roads entering Ulaanbaatar. In addition, a further two to three secret roads have been created recently along routes that were previously unused. These are used primarily by those wishing to transport illegal goods, and in particular, timber. Surprisingly, the officers of MNE, inspectors, and patrols mostly check the official roads, ignoring the clandestine routes. Trucks commonly use paved roads and divert onto dirt roads just before reaching checkpoints. According to a checkpoint officer, permanent post officers are aware of this situation but feel unable to leave their stations unmanned in order to chase after these trucks—and therefore remain largely ineffective. A fair assumption would be that all trucks traveling at night on unauthorized roads are carrying illegal timber. Drivers with papers enter the city during daylight hours, although 80 percent of them have some irregularity with their documents. Many drivers transporting illegal timber travel at night, although this may be

due to the Mongolian climate as much as to the presence of inspectors; in the summer, engines become overheated during the hot days if the load is heavy, and in the winter drivers travel at night to keep the engine warm and prevent damage from freezing in the colder night-time temperatures. A driver who transports illegal timber said: "*Otherwise there is nothing to be afraid of. Inspectors are easy to please*."

Those who transport illegal timber using the railway do not have to worry about sudden inspections, but incur the regular cost of bribery. Recently the frequency of inspections has increased, thus reducing the opportunities for illegal rail transport; as a result, most illegal timber is now transported by road. When freight trains enter the city, retail traders from the timber market come to the railway terminal and buy the timber wholesale.

The majority of wood entering Ulaanbaatar is declared as fuelwood. However, in reality there is a substantial quantity of timber that enters the city hidden under layers of fuelwood. The main reasons for thus disguising timber are: a certificate of origin is not required for fuelwood; permits to cut timber for fuelwood are readily available and relatively inexpensive; wood that is labeled as fuel is less frequently inspected, and

One of many wood processing sites at Tunkhel. Image: Ts. Erdenechuluun, 2005.

Workers load a truck at one of Ulaanbaatar's timber markets. Image: Bryony Morgan, 2006.

Fuelwood and planks on sale at a bus stop near a timber market in Ulaanbaatar. Image: Bryony Morgan, May 2006.

therefore easier to bring into the city; and royalties paid on fuelwood are considerably lower than on industrial timber.

Sales

Four centralized timber markets were established in 2001 to help regulate sales and take initial action against illegal logging. However, the timber business boomed; according to the SSIA's assessment, at the beginning of 2004 there were 37 timber markets and a far greater number of fuelwood markets in operation. The SSIA is working to clamp down on this situation. As one official said, "*it's very difficult because people call the very next morning after an illegal market has been closed, asking us to reopen it. Among those who operate fuelwood markets there is even a state-honored actor*." Although there is a widely held perception that the SSIA officers conspire and cooperate with illegal loggers, it was suggested that they may also be pressured by people in higher positions of authority. In addition, the timber traders are becoming more organized and powerful.

The big timber markets of Ulaanbaatar are divided into two groups, representing the aimags that currently supply the most timber—Selenge and Arkhangai.[16] These, rather than the SSIA, dictate the working procedures of the wood markets. Traders who sell wood at licensed markets generally hold a permit, although it may be forged, but a considerable proportion of the wood on sale at these markets will in fact have been obtained illegally. All of the timber at the illegal markets has been illegally cut, and is sold by unlicensed traders. A significant quantity of wood is also sold privately by families from their homes or at street corners and bus stops in ger districts; these sales points in the residential areas are convenient for

1 The aimag of Tuv, traditionally an important source of timber, is depleted to the extent that it is no longer represented by a distinct market.

customers, and indeed many of the private merchants make deliveries.

There are two types of retail sellers at the timber markets—those who sell timber and those who sell fuelwood. Timber traders usually have significant financial resources and may have acquaintances in the railway authority; often they are natives of forested regions who currently live in the city. Selling timber is fairly easy and profitable. Fuelwood traders, on the other hand, are relatively poor—often migrants from the countryside without official registration papers, who are unemployed and sell fuelwood in order to survive. Selling fuelwood cheaply generates very little income despite the hard work of sawing, chopping, and packing the wood in sacks.

Investigating the Illegal Supply Of Timber to Ulaanbaatar

We investigated the illegal supply of timber to Ulaanbaatar, including volumes, techniques, and mechanisms. The research included initial consultations with the Specialized Inspection Department of Ulaanbaatar City, MNE, the Registration Unit of the Central Police Department, and local government officials. However, the data made available were unsatisfactory, as none of the organizations the interviewees represented had investigated the illegal logging issue in depth. Therefore, we sought additional quantitative information in a number of ways.

Survey Methods

- Trucks were monitored entering the city from all directions over a 24-hour period, through stationary and mobile patrols at five points, to obtain accurate and comprehensive figures on the number of timber-carrying trucks entering Ulaanbaatar in a given day. A partial repeat of this count was conducted almost one year later following the establishment by MNE of an Office for the Management of Wood and Wood Products. The establishment of this office was thought to contribute to a decrease in the quantity of illegal wood entering Ulaanbaatar; the reduced supply was apparent through the relative increase in wood prices in Ulaanbaatar over this period. We sought to verify the actual impact of these activities on the illegal logging supply.
- Trucks were counted arriving at the two largest official timber markets—Khangai and Tsaiz—during the course of one day, to estimate the percentage of the wood entering Ulaanbaatar that is sold at official wood markets.
- To establish the routes taken by timber trucks, vehicles were counted at the 22 km check-point—the official entry point to Ulaanbaatar from the northwest—and again further down the main road at the Route 61 level crossing, the route taken by most of the illegal timber trucks.

In addition, on-site investigations were conducted at 39 markets selling both industrial timber and fuelwood, and several tens of markets selling only fuelwood, to make relevant observations. Nine of these markets were officially licensed; the others were illegal. Surveys were conducted at 22 of these markets, and 54 salespersons and members of the market administration staff were interviewed.

Findings

This study took place during a period when MNE had launched a two-month campaign to intensify the fight against the illegal timber harvesting business. After they increased the number of inspections in areas around Ulaanbaatar, the number of trucks observed carrying illegal timber appeared to be lower than average. Nevertheless, 93 trucks were observed entering the city at night and 56 entered during the day—a total of 149 trucks entering the city with loads of wood in one 24-hour period. The unofficial SSIA estimation of an average of 300 trucks entering the city every 24 hours during the normal period seems a reasonable figure. Based on this estimate, around 1 million m^3 of timber must enter the city by truck during the course of the year. During a partial repeat of this count at one site, 78 trucks were recorded entering Ulaanbaatar with loads of wood within a period of 10 hours, indicating that there had been no significant decrease in the amount of timber arriving in Ulaanbaatar. The study also revealed that of the 89 trucks and trailers recorded at Route 61 level-crossing, only 26 had entered the city through the 22-km checkpoint. Therefore, the remaining 63 vehicles had entered the city via illegal routes.

During the first study period, wood traders claimed that very few trucks had lately been entering Ulaanbaatar due to the intensified inspection and checking operation. However, on the day of the survey, 46 trucks arrived at the Ulaanbaatar markets (19 at Khangai and 27 at Tsaiz) and unloaded mostly fuelwood. Based on this observation, it is estimated that only 15 to 25 percent of the timber sold in Ulaanbaatar goes through the large official timber markets.

As a result of these investigations, we estimate that 85–90 percent of the current total wood consumption of Ulaanbaatar—1.0 to 1.1 million m^3 of the 1.2 million m^3 consumed annually—is derived from illegal sources. This estimate is supported by an inspection conducted at Ulaanbaatar's timber markets in June 2004 by the SSIA and the Inspections Department of Ministry of Nature and the Environment, which found that about 90 percent of wood being sold had no certificate of origin.

If the upper end of the estimates of total annual consumption of wood in Mongolia is correct—approximately 5.5 million m^3—with limits of about 650,000 m^3 set annually by MNE, this means that around 88 percent of all wood consumed in Mongolia is supplied illegally. However, a large amount of the timber consumed in rural areas is fuelwood, which is often done without permits. This should probably not be categorized as illegal, since it is meeting the subsistence needs of the users and they currently have no real alternative.

Profits in the Illegal Timber Trade

Illegal logging is considered to be one of the three most profitable natural resource-based businesses in Mongolia today—the others being illegal gold mining and the wildlife trade. As a result, those involved in illegal logging are highly persistent, even in the face of intensified government inspections and controls.

Industrial Use Timber

Data collected indicated the following:

- *Loggers*. Each logger earns 5,000–6,000 Tg for cutting a truckload of 60 to 70 logs, which takes between a few hours and a day. Some loggers work year-round, others only when they need money or can find work. Most logging is done in teams of three or four people. The group manager can sell a truckload of logs for processing for 40,000 Tg, making a profit of 20,000 Tg.
- *Transport to sawmill*. Drivers of special heavy-duty trucks move timber from the harvesting site to the landing and sell the timber to sawmill operators. The distance covered is only one to five kilometers, but road conditions are extremely difficult and as a result drivers can only make one or two trips a day. Drivers earn 10,000 Tg per trip in addition to fuel costs.
- *Sawmill operators*. Sawmill operators share 25,000 Tg per truckload of wood, while the owner makes a net profit of 45,000 Tg from the timber and additional sums from the sale of offcuts and sawdust.
- *Transport to sales point (truck)*. This is the easiest but riskiest stage of the operation. The minimum profit after expenses for transporting timber to the city, which takes one night, is 60,000 Tg. The driver's take-home pay can be considerably increased if he does not encounter inspectors along the way, or has contacts to avoid paying bribes or fines. In addition, drivers can increase their profits by purchasing 8 m^3 truckloads of timber and selling them on the market as 10 m^3. Whereas bribes paid to police and traffic inspectors used to range from 10,000–30,000 Tg, in the past year the rates of both fines and bribes have increased dramatically, reportedly now ranging between 100,000 and 350,000 Tg.
- *Transport to sales point (rail)*. This method of transportation is only used by a small number of people with large amounts of money. There are 15 such traders in Ulaanbaatar; two of them are considered big players, with turnovers of more than 50 million Tg, and the remainder are small players with turnovers of around 10 million Tg. After the costs of transport, loading, unloading, and bribes, the manager of the process stands to make around 300,000 to 500,000 Tg. In recent months, with increases in the costs of both gasoline and wood and the intensification of inspection activity, the cost of bribes has also risen, which has impacted the profitability to traders. Timber traders have therefore transferred the increased costs to the sales price of the wood, leaving their profit margin intact, with the result that the price rise is felt only

Often poor people, including women and children, have the hardest jobs in the timber trade chain for the lowest salaries. These women are working at a sawmill in Tunkhel. Image: Ts. Erdenechuluun, 2005.

by purchasers. However, timber remains cheap in comparison to alternatives and therefore demand is still high—sales have not decreased as a result of the price increases.

- *Merchants*. Wood merchants specialize in the sale of either timber or fuelwood. In addition, some merchants saw lengths of fuelwood and sell them as timber. Commercial wood sellers make a profit of approximately 65,000 Tg from one truckload of wood. They increase their profit by cheating on measures, for example selling 0.46–0.9 m^3 as one cubic meter. This is easily done because most buyers do not know how to measure the wood.
- *Assistants*. Those at all stages of the timber business work for 3,000–5,000 Tg per day, earning 90,000–150,000 Tg a month. With bonuses, and sometimes by cheating on measures, some workers may earn 200,000 to 300,000 Tg a month.

Fuelwood

- Fuelwood traders at the market earn 45,000 to 50,000 Tg from each truckload. If they sell wood not by the sack but by the cubic meter, they can increase their earnings by cheating on measures. Customers prefer to buy fuelwood in the form of individual logs because they can see what they are getting; however, even in this case it is possible to cheat for additional profit, as was demonstrated to researchers by a fuelwood trader.
- Cutting logs intended as fuelwood into timber increases the value of the wood; one truckload can bring a profit of 57,000 Tg, with additional revenues possible from cheating on measures. Offcuts and sawdust can also be sold for extra income. This form of trade has decreased somewhat since MNE regulated that wood designated as fuel must be cut into 50-cm lengths upon entry into Ulaanbaatar. However, this rule is not always

followed, and wood destined for timber can be hidden by a layer of cut fuelwood.

- Many people buy fuelwood packed in sacks wholesale from the timber market and resell it at bus stops or in streets on the outskirts of the city. These people add 150 Tg onto the price of each sack to resell it and make a profit of 57,000 Tg from one truckload of wood. Nevertheless, as it takes between two and four weeks to sell one truckload of wood, depending on the season, such merchants only make enough money to cover their daily needs—although they do also obtain "free" fuelwood.

Abuse of Procedures and Permits in the Illegal Industry

According to official procedures, once companies have been granted an operating license, they should be able to obtain a timber harvesting allocation from MNE simply by submitting an application through their local aimag administration and MIT. Yet in practice it is extremely rare for companies to obtain a timber harvesting allocation according to the official procedures. There are two main reasons for this problem:

1. Obtaining an operating license can be a difficult and drawn-out process. The procedure for issuing such licenses was set out in 2002 by MNE Order No. 100, which identifies seven basic criteria that must be met by all applicants. Many of the application requirements are relatively unimportant but highly inconvenient—such as a reference letter from the local governor, a bank guarantee, and a business plan. Most companies are denied licenses on the grounds that they do not possess the technical and financial capacities to meet the licensing criteria. Such obstacles are usually faced, however, by applicants without relevant connections. For those with useful contacts, the operating license is simple to obtain. In fact, there are cases in which timber harvesting allocations have even been granted to companies with no license at all.

2. The official AAC set by the MNE is far lower than the demand for timber in Mongolia, as was demonstrated in previous chapters of this report. Most forestry companies accept that they cannot obtain a timber harvesting allocation from MNE without connections among high-ranking officials, and/or the ability to pay important bribes. As a result, many companies have resorted to a variety of illicit methods in order to do business in the forestry sector. The accountant for one such forestry company encapsulated the situation with the following story from 2005: "*We are one of the few remaining old timber mills, having been in operation for the past four decades. We were not able to get a certificate of origin even after running around and begging for almost two months, so finally we asked a favor from a public figure. He called the minister and, just half an hour later, I was exiting the ministry with the permit in hand. If it was this difficult for us, it must be nearly impossible for everyone else*."

The ways in which companies commonly obtain permits include:

- Direct bribery of officials; larger bribes have resulted in larger volumes of timber indicated on certificates of origin.
- Using contacts to obtain licenses or greater harvesting volumes. This can take several forms:
  - Connecting with those in a position of authority at a permission-granting office at any level.
  - Offering favors, either personally or through a close friend or relative, in return for special consideration.
  - Eliciting a telephone call on one's behalf from an influential individual, such as a member of Parliament, a minister, a managing official of the governing political party, or a famous artist or sportsman.
  - Collusion and sharing of profits with officials.
- Offering bribes through the intermediary of well-connected contacts, in cases where money or connections alone are not enough.
- Buying licenses on the black market.

Evidence exists that the certificate of origin and forest-use permits, once obtained, are being misused in a variety of ways (Table 11).

Table 11. Types of Misuse of the Certificate of Origin and Forest-Use Permit by Illegal Timber Suppliers

Certificate of Origin	Forest-Use Permit
Multiple use of the permit, made possible by gifts to appropriate individuals.	
Cutting of a greater quantity of timber than allowed by the permit.	
Leaving the date on the permit blank, and only entering the date when an inspection patrol is encountered.	
	Obtaining a forest-use permit with an extended period of validity, with the assistance of the forest ranger, and using this permit for repeated trips.
Falsification of the certificate of origin. This is very simple as the document is printed on hard, glossy paper. An inexperienced inspector cannot distinguish a forged document from the original.	Falsification of the forest-use permit. Inspectors are generally satisfied with any permit carried by transporters of fuelwood, even if the document has been slightly modified.
Presentation, in the case of large companies with timber harvesting allocations from the ministry, of a simple expenditure sheet in place of a certificate of origin when bringing timber into the city. Typically no one checks whether the company's permit has expired or not.	Use, in the case of companies with timber harvesting allocations from the ministry, of a company expenditure sheet in the place of a permit to prepare fuelwood.
Shipping wood in a spaced convoy of trucks covered by a collective certificate of origin. This strategy is designed to confuse inspectors, who may not keep track of how many trucks have already passed by under the same document.	
Sale of certificates of origin by employees at all levels of issuing organizations. A certificate of origin for a truckload of industrial timber costs 50,000 to 100,000 Tg and for a railway wagonload costs 150,000 to 200,000 Tg.	
Use of certificates of origin issued to companies in rural areas—who have little need to present the certificate—by companies bringing forest products into Ulaanbaatar, possibly in conspiracy with local and national environmental officials.	

Forms and Rates of Bribes

People involved in the illegal timber trade carry out their business by working in collusion with or by bribing relevant officers at all stages—from the purchasing of logging permits to the sale of wood in Ulaanbaatar. Almost all civil servants and members of the business community are aware that such bribes have established rates, and are open transactions carried out at set locations with specific individuals. Bribes are mostly paid in cash, but in some cases they are offered in the form of vodka or wood. Details are listed in Table 12.

Negative Impacts of Illegal Timber Harvests

Ecological Impacts

The damage to forests by pests and forest fires is widely reported, albeit frequently without a complete understanding of the important ecological role these elements play in maintaining forest structure, but the negative impacts of illegal timber harvesting on the ecology of the forests are rarely discussed.

Table 12. Details of Bribes

Reason and situation for the bribe		Recipient	Amount
Ensure selection of one's company in the application process for logging licenses.		Ministry of Nature and the Environment staff, tender process working group.	1–5 million Tg or 10 percent of profit.
Purchase of a certificate of origin.		Seller of the certificate of origin.	150,000 Tg for a 10 m^3 license 200,000 Tg for a 20 m^3 license 500,000 Tg for a 50 m^3 license 1 million Tg for one rail wagon load (the permit can be used repeatedly)
Arrangement with the forest ranger prior to logging .		Forest ranger	10,000 Tg
Secure release if caught by forest ranger.		Forest ranger	30,000 Tg
Transport timber to UB	Traffic police posts on the road	Policeman	20,000–30,000 Tg
	Permanent main checkpoints to enter Ulaanbaatar (avoid and go around the checkpoint if there is no contact)	Policeman/ Inspector	
Avoid detention if an inspection team is encountered on the road while transporting the timber to Ulaanbaatar.		Inspectors	Confiscation of timber or half its monetary value (100,000–350,000 Tg). Two to three trucks can attempt to enter with a single payment.
Avoid detention if an inspection team is encountered while transporting the timber via railway. One payment will usually cover three or four trips.		Inspectors	200,000–300,000 Tg
Ensure that cars are available for rail transport.		Head of railway depot	50,000 Tg per wagon
Multiple re-use of the certificate of origin at point of departure.		Railway officer of departure terminal	50,000 Tg per wagon
Multiple re-use of the certificate of origin at point of arrival.		Railway officer at Ulaanbaatar railway terminal	10,000–20,000 Tg
Paper with instructions for the load to be allowed to pass freely through checkpoints.		High-ranking official	Not known
Avoid capture by inspectors while selling timber at a market without any documents. One payment will protect the seller for about a year.		Inspector	About 100,000 Tg, depending on timber volume.

Illegal timber harvesting clearly has reduced the size of forest inventories in those stands that are readily accessible or near urban areas, with valleys stripped bare of timber. In areas that are being utilized for private-use timber or fuelwood, non-professionals selectively cut trees of around 20-cm diameter to produce rough-sawn timber, as well as smaller trees to be used as scaffolding in construction work. In fact, removal of smaller trees could play an important role in thinning forest stands and making them more fire resistant if this was done according to a management plan. Currently, there is no effective management of this process and the benefits are not being realized. In areas where high-value timber is being felled, only the largest, most fire- and wind-resistant individuals are taken, damaging the structure of the forest and making it more vulnerable to fire. In addition, the wood that loggers consider to be scrap is trimmed from the trees and left in the forest. This dead wood results in a high fuel load, increasing the chances that a forest fire will burn fiercely and spread to the crowns of trees, rather than merely burning the undergrowth and keeping the fuel load low.

Other potential problems resulting from the depletion of forest cover include impacts on the quantity and quality of water resources in the area, although the relationship is complex. Soil from clear-cut areas may also be more prone to erosion.

As timber is not extracted according to a long-term forest management plan, there is no attention given to the impact on NTFPs. Timber harvests are not optimized to provide the maximum possible benefits for biodiversity and the production of NTFPs. Illegal loggers may hunt wildlife unsustainably—hunting being identified as a crucial natural resource management (NRM) issue in Mongolia (Wingard and Zahler, 2006). The creation of logging roads can provide access for others to do the same. While felling timber, workers may also gather products such as berries, mushrooms, moss, nuts, medicinal plants and juniper, possibly depleting these resources in many areas.

Economic Impacts

By preventing people from harvesting timber legally and according to transparent procedures, the government denies itself important revenues. The Law on Fees for the Harvest of Timber and Fuelwood, enacted since 1995, incorporates fee schedules to raise revenues from resource use. Forestry companies are supposed to pay both license fees and stumpage fees in order to undertake forestry activities. Although difficult to estimate, collecting fees for all of the wood sold at timber markets could raise an additional 6.5 billion Tg ($5.4 million) annually. That is ten times the state revenue currently raised from forest-use fees, which was only 630 million Tg in 2003 (MNE, MOSTEC, Open Government Website in Wingard and Zahler, 2006). In addition, a large proportion of all timber used is not actively traded, being mostly used as fuelwood and private-use timber in rural areas. This wood should also be subject to fees, as should construction poles and pit props. In 2003, the 678 business entities operating in timber production and timber products paid 1.1 billion Tg in taxes (Report of the National Taxation Authority, 2004). This amount is insufficient, as the majority of timber cut by companies is done so secretly and illegally, and consequently all associated activities are inevitably hidden. If full taxes were collected on all forestry operations and cut wood, this sum would reach several billion Tg.

Although it is not by any means recommended that the government attempt to legalize the current levels of harvest, which are unsustainable, it is clear that more realistic harvest volumes could provide vital state revenue, which would allow for sustainable management of the resource. According to the Law on Reinvestment of Resource Use Fees for Conservation (2000), 85 percent of timber and fuelwood fees should be channeled into environmental management, although this rule is not always followed. Inspection and monitoring expenses are increasing with rising costs of operation, while revenue collection is remaining roughly constant. It is a commonly held view that the government is unable to control illegal logging because of constraints on finances, and the manpower and equipment to do the job. If resource-use fees were collected in their true amounts, these constraints could be lessened.

Illegal logging is also harming the national economy by preventing the development of the forestry industry and constituting a barrier to the establishment of a positive business environment. Illegal loggers have minimal costs—only fuel and labor—and do not pay taxes. They are thus able to sell their timber and wood products at a relatively low cost, hindering the

competitiveness of those working within the law. This undercutting of the market value for timber lessens the economic contribution of the legal Mongolian forest sector; in fact, the *Mongolia Forestry Sector Review* (Crisp et al., 2004) found it to be marginal. During one of the interviews for this report, a manager of one sawmill said: "*If we paid taxes according to the official procedures and regulations and sold our products at the current market price, we would not make any profit at all. Therefore, in order to compete with people who use cheap, stolen timber, we have no choice but to act illegally. With the current situation, companies operating within the law have no opportunity to grow; and if this continues, eventually they will have to declare bankruptcy.*"

In addition to the lessened contribution to the formal economy, unsustainable and illegal logging can also harm the livelihoods of those citizens dependent on natural resources. If timber supplies become depleted in an area, rural residents may have to travel further to get fuelwood, or buy supplies.

Social Impacts

During the course of these investigations of illegal timber harvesting, we discovered great changes taking place in Mongolian society. People are no longer restrained by the taboos that used to protect the forests. These taboos have not been replaced by an understanding of modern ecological principles, which would encourage people to value the forests. In former times, Mongolians worshipped nature and showed respect for trees in particular, as reflected in traditional proverbs such as:

If the root of the tree is cut, the root of the seed is cut.

The curse of a tree damns the seeds of the seeds.

Selling water will make you rich; selling wood will make you poor.

People are no longer afraid of breaking the law. In the past, the government successfully suppressed many illegal activities, such as the theft of copper and aluminium and illegal distillation of spirits. At that time, government and law-enforcement institutions were not caught up in crime to the extent that they are now, and people used to fear the state. Civil servants have lost the respect of the population through their involvement in the illegal timber trade and people no longer respect or trust the government, the justice system, or the police. Although the forestry sector is not a large part of Mongolia's economy, it is important to tackle corruption in this industry because illegal logging requires the compliance of actors at so many stages of the chain. Corruption in the natural resource industries is particularly pervasive, and tends to spread to other areas.

Likely Future Trends in Illegal Harvesting

Illegal timber harvesting offers a low-cost, high-profit business opportunity that is attracting more and more people. The illegal industry, with its lower costs, easily out-competes those who are trying to operate legally. The widespread nature of illegal logging inspires more people to enter this occupation. This spiraling situation is constantly worsening, and now even women and foreign citizens—such as Chinese and Koreans—are becoming involved. Many people believe that illegal logging will not stop until the last tree in Mongolia has been felled. Only the Government of Mongolia can bring the forests under wise and profitable management.

4. Causes and Control of Illegal Logging

There are many reasons for the expansion of illegal logging activity. They include increasing demand for timber; outdated government policies; problems with the forest ranger system; corruption, with some inspection and legal personnel deeply involved in the illegal trade; high profits generated by the business; unemployment caused by the collapse of the Soviet-era forestry sector; and poverty. Multiple areas of conflict exist in the processes controlling the forestry industry, and the private sector and illegal loggers have acted quickly to take advantage of the confusion to expand their businesses. Furthermore, the work of the authorities is often slowed by bureaucracy, while the thieves act with speed and innovation.

Causes for the Expansion of Illegal Logging

High Profitability

Those involved in the illegal timber business stand to make large profits, given the lack of control over the industry, limited legal supply, and the low chance of encountering any major penalties through law enforcement.

Demand Exceeds Legal Supply

While the question of whether Mongolia's forest resources are sufficient to sustainably meet the annual demand is a contentious one, it is clear that the legally authorized supply of timber is far below current levels of consumption. The sharp reduction in the levels of authorized timber harvests, coupled with increasing demand for timber and fuelwood, constitutes the ultimate cause of the increase in illegal logging. Timber demand and consumption are likely to remain artificially high as long as prices are subsidized with cheap illegal wood. If consumers had to pay the true cost, including taxes and royalties, they might well make different decisions in their usage of fuelwood and timber.

In fact, the survey of timber product manufacturers (Chapter 2) shows that not only does the demand for timber exceed legal supply, as shown by their current annual consumption, but in fact there has also been an overinvestment in this industry, as most companies are not able to obtain the raw materials needed to allow them to operate close to full capacity. To meet the processing capacity that currently exists in Mongolia would require a further increase in illegal logging, which would not be sustainable over even the medium term. If the illegal trade can be brought under control, and a realistic, non-distorted price structure emerges, the price of timber will rise, which should result in a more efficient use of wood. Under these conditions, imports of timber from Russia may also be more economically viable, which could be another source of raw materials for Mongolia's wood processing industry.

Uncertain Land Tenure and Natural Resource Use Rights

Forests in Mongolia are essentially an open-access resource, and there is no recognition of rights over the timber by the local community. The contrast between attitudes toward private property and common

resources is telling. If a family should lose ten planks of wood from its compound, it is likely to result in confrontations and the police being called in. When trees far greater in value are stolen by the truckload from the forest, there is little reaction.

Poverty and Unemployment

With many people in poverty, there are many who have no choice but to make use of the free, unguarded timber resources on the mountainsides. Although this may add up to significant amounts, the volume of timber taken per person is low and is meeting subsistence needs. The most damaging exploitation—the large-scale illegal timber harvesting and trading—is done by people who possess at least vehicles and the finances to bribe their way through inspections. Those who regularly steal small volumes of wood, without any form of mechanized transport, are usually extremely poor. Local authorities are responsible for helping to improve the livelihoods of such people, and clamping down on their role in illegal logging would simply increase their hardship. Local administrations often turn a blind eye to small-scale illegal logging—for example, drivers transporting stolen timber may have their documents and vehicle plate numbers confiscated, but within a few days they generally manage to obtain replacements.

Although the illegal timber trade is largely driven by the large profits that can be captured by those at a high level within the supply chain, the people who actually harvest the timber often have little alternative for making a living. The collapse of the legal timber industry has produced unemployment, exacerbated by a lack of planning and retraining, and the privatization process led to the dissolution of most professional organizations responsible for forest protection and timber harvesting. Thousands of former forestry employees are now working illegally within the sector. In addition, many engineers and technicians have become managers of illegal operations. In recent years, some employees dismissed from posts in the environment sector have gone on to become illegal loggers.

Poor Governance

A number of issues concerning the structure, operation, and policy of the institutions charged with controlling the illegal timber harvest and trade are contributing to the rise of illegal logging. The Government of Mongolia is taking action to deal with some of these problems. These efforts are examined in the next section.

Overlapping Roles and Responsibilities

Nationally, there are several institutions that are responsible for developing and monitoring the forest industry, but there is some overlap between their responsibilities. For example, there have been a number of attempts to increase the inspection role of MNE, which can conflict with the role of the SSIA. This is detrimental when the organizations involved do not cooperate. In addition, some issues—such as fuelwood supply to Ulaanbaatar—are not addressed by any institution. Many problems related to timber production and supply result from the lack of information, capacities, or resources within MNE, but many issues that could have been resolved without significant resources have remained unaddressed due to insufficient organization and interest.

Unclear Legal and Regulatory Framework

The current legal framework for the timber business is not satisfactory. Overlaps in regulations create confusion over implementation. For example, three different procedures were approved in 1997, 2000, and 2002 for forest cleaning activities, and it is unclear to operators which of these should be followed. There are already a sufficient number of laws in place that prohibit illegal logging, but there is a lack of implementation procedures, personnel, guidelines, and mechanisms. There are also many laws and regulations that simply take the form of general declarations (Appendix D). Furthermore, rather than collaborating to ensure the implementation of existing laws and regulations, the various agencies and organizations each offer their own interpretations of the rules, thus creating technical obstacles to the effective fight against illegal logging.

Lack of Long-term Strategy

The old forestry policy disappeared with the collapse of the socialist system; since then, activities in this sector have not been guided by a consistent strategic policy. The government is reluctant to make major changes since it is under constant pressure from opposing

political parties and local residents. A major problem is that government policy decisions have tended to be made by temporary, non-professional political appointees with little input from experienced professionals, and with little sense of long-term strategy. This situation has not been helped by the politicization of the Mongolian civil service: nearly the entire civil service tends to be shaken up following each election. As a result of this lack of long-term focus, MNE can get caught up in minor details and distractions, while major policy issues are not addressed.

Poor Policy

Increasingly, the guiding principle of Mongolia's national forestry policy is that timber production should not be directed by market demand. The government has adopted a strategy of forcing a reduction of supply rather than controlling demand, a policy it attempts to implement through increasingly tough inspections and controls. This policy has significantly reduced state revenue, while failing to address current market demand. The overwhelming majority of all wood consumed in Mongolia is prepared illegally. This cheap timber undercuts the market, lowering prices so that the ability of legal operators to work in the forestry sector is further decreased. In addition, by setting legal harvest limits an unrealistic 20–30 times lower than actual levels, a situation is created where abuse and corruption inevitably flourish. MNE has thus trapped companies by issuing licenses with unrealistic harvest limits, and in return the companies trick the ministry by pretending to do business according to these licenses.

Moreover, MNE's detailed guidelines and regulations for the limitation and elimination of illegal timber production set excessively stringent requirements, creating a situation where the regulations cannot be implemented in practice. This system gives civil servants significant powers, tempting many of them to act outside the law, while at the same time limiting the opportunities for businesses to harvest timber legally, and thus pushing them toward illegal logging.

Considerable sums from the state budget have been expended to date on high-profile inspection activities, but the results have been poor. Although the fight against illegal logging and the campaign for environmental protection are widely reported in the mass media, in reality attention is focused on a few small traders without real connections, while the true managers of large, illegal logging operations remain untouched. In addition, the effectiveness of organizations responsible for controlling illegal logging is limited by their inability to operate in a coordinated manner.

Perverse Incentives

Local authorities are charged with generating revenues from their forest reserves, which conflicts directly with their role and responsibility in forest conservation. In addition, local governors have full authority over the use of income generated by forest-use permit fees, so their priority tends to be income generation rather than conservation, and the harvest levels set by MNE are not observed. There is no institution or structure serving to control volumes of timber harvesting in comparison to revenues from forest-use permits, or to monitor the use of such revenues. According to the Law on Reinvestment, 85 percent of these revenues should be used for the conservation of the resource.

Weak Capacity and Lack of Resources

The ability to combat illegal logging is constrained by a lack of capacity and financial resources. As in many other sectors, a lack of research and reliable statistical data in the forestry sector make it impossible to conduct realistic and accurate analyses of the situation. This results in policy development and actions being based essentially on guesswork. A lack of adequate financing makes the situation even worse. For example, financial constraints have prevented the construction and maintenance of logging roads to regions with large timber reserves, placing still more pressures on the forests close to urban areas. Human resources within government forestry sector institutions are also inadequate at every level.

Much of the responsibility for fighting illegal logging is now being given to local administrations; however, they are not given a corresponding budget, and hence are often powerless to take action. For example, in recent years the number of forest rangers has been reduced by a factor of four, and provisions such as rifles and horses have been eliminated. Whereas during the socialist period there were more than 30 rangers and five inspectors employed in Mandal soum

of Selenge aimag, according to current standards there should be only 17 rangers and four inspectors—yet in reality there are just five rangers and two inspectors. In addition, the area assigned to one ranger is too large, as all inspectors and many forest rangers live in settlements that are often far from the forests where the illegal logging activity takes place.

Many of those charged with enforcing the restrictions on timber trade lack the training to do so. For example, the knowledge of police officers of the issues is often very scant. They find it difficult, even embarrassing, to work with thieves who are far more knowledgeable than themselves. Policemen cannot identify and differentiate between different types of wood by sight, and in some cases they cannot even distinguish a fuelwood permit from a certificate of origin. The police department, like other governmental institutions, suffers from financial constraints. For example, the meager daily gasoline allowance of the police force is just barely enough to patrol the city center, leaving nothing for trips into the countryside to investigate illegal logging. In addition, the police department lacks proper equipment, and cooperation with inspection authorities is poor. Other departments that could play an important role in controlling illegal logging, such as the traffic police, are not involved since it is not their primary duty. A traffic policeman might stop a truck loaded with stolen timber for having a broken light, but never look at the load it is carrying.

Corruption

Corruption is an important factor supporting the widespread existence of the illegal timber trade. Forestry sector authorities, the police, and inspectors have all been implicated. The illegal timber trade requires collusion at all levels within the supply chain. The Mongolian civil service is shaken up following each election, and professionals are sometimes dismissed from their posts. In the forestry sector, many of these people may end up involved in the illegal timber trade. Their replacements, who often have little knowledge of their new position, have ended up fighting against their own predecessors, who have become thieves with specialized inside knowledge.

Some high-ranking officials reportedly use the sector for political gain. For example, illegal logging activity increases during election campaigns, as some candidates from forested areas allegedly order the release of offenders in order to obtain their votes. Illegal loggers know this and behave accordingly. This situation apparently occurred during the 2005 presidential elections when illegal activity rose to near peak levels. Once started, the problem is extremely difficult to fix.

Law enforcement and inspection agencies, and in particular police officers, are deeply involved in the illegal timber business. It is common to see a uniformed police officer sitting in the front seat of a truck loaded with stolen timber, escorting the load. Cases referred to the police are often unresolved, or verdicts are given in favor of the thieves. There are also reports of cases brought by the police that were stopped by the prosecutor's office.

The average monthly salary of field-based forestry sector government workers—48,000 Tg—is lower than that of almost any other sector. This is 42 percent lower than the national average of 81,500 Tg (Statistical Bulletin, October 2004). This might be one reason why such government employees are easily subject to bribes. **It should be stressed, however, that many hard-working civil servants were met during the work on this report, people with great loyalty and integrity in their mission to protect the forests, despite their low wages**.

Lack of Transparency, Independence and Accountability

As much of the responsibility for management and control is being transferred to local governments, local governors are responsible for appointing the majority of staff, e.g. forest rangers, who depend financially on their local administrations and therefore cannot act with complete independence. Environmental inspectors report directly to the SSIA at all levels. However, they too can be influenced by local government, and during work for this report a number of cases were described to the researchers in which environmental inspectors were directed toward other duties to remove them from the scenes of illegal activity.

Corruption within the forestry sector is made possible by the lack of transparency that exists in decision making. As the sector is now so dominated by the illegal economy, everything has become secretive,

impenetrable, and uncoordinated. As a result, official statistics, reports, and other data concerning the forestry sector are unreliable, and a stage has been reached where poor decisions are made on the basis of data that is known to be false. The weakness of the accountability mechanism at all levels has made this issue even more serious. There is considerable abuse of the rights to harvest, use, and inspect timber in rural areas. Even the governors of some soums and aimags, granted four-year mandates but no money, are said to organize logging teams themselves and harvest timber.

Government Responses to Illegal Logging

Responses to illegal logging can be broadly divided into three categories: (1) actions concerned with preventing illegal logging; (2) efforts to increase detection of illegal harvest and trade; and (3) attempts to suppress the activity (Box 4). The "Prevention, Detection and Suppression" framework has been developed as part of the World Bank's Forest Law Enforcement and Governance (FLEG) program, which has also supported regional FLEG processes. Mongolia participates in the Europe and Central Asia process; the MNE state secretary is the focal point for the government.

Tackling illegal logging in Mongolia requires a coordinated response by the Government of Mongolia that draws in elements from all three of these categories, and links the response to the socioeconomic context in which the illegal logging is occurring. For example, logging for subsistence purposes may require responses predominantly from the prevention category, such as increasing legal supplies of timber, promoting alternative energy sources, and strengthening resource user rights. Tackling illegal logging by large companies will require more emphasis on combating corruption, increasing transparency, improving monitoring and auditing of operations, and strengthening the ability of the police and judicial systems to prosecute criminals. The government has taken action at many levels, but unfortunately the desired outcomes have not always been achieved, due to lack of effective implementation or abuse of procedures. In some cases, the policy or action has actually made the situation worse (Appendix D). When actions to date are examined in the context of the prevention, detection, and suppression framework, it is apparent that activities have mostly focused on fairly narrowly focused prevention and detection responses. There is a notable lack of attention paid to suppression. This is reflected in the poor results regarding the reduction of illegal logging. There have been very few convictions of illegal loggers, and large-scale operators and corrupt officials are largely unaffected by actions taken to date.

Prevention

The government has taken various actions to prevent illegal logging, including putting in place a permit system to manage timber harvest and trade, with requirements for a logging company to have a certificate of origin for timber and a forest-use permit. Some of the contradictions in government policy that are the root cause of unsustainable harvests have been identified. For example, at the beginning of 2006, the SSIA issued an official request to MNE and MoF to resolve the contradictions between the requirements on state income from logging set by MoF, and the timber cut limit given by the MNE.

Measures to combat corruption. Beginning in 2006, aimag governors have control over the allocation of 50 percent of the industrial timber quota within their jurisdiction. This is considered by MNE to be more transparent and less prone to corruption, although without the necessary measures in place to prevent corruption from occurring or to detect it when it does, it is likely that the source of corruption will merely shift.

Measures to increase transparency in the allocation of concessions. Draft procedures have been submitted to the Ministry of Justice and Internal Affairs that would cover the procedure for selecting the companies to be granted timber quotas and increase the rights of local communities in this process.

Reducing demand. Attempts have also been made to reduce demand for timber by banning exports of uncut timber. The government is becoming involved with several projects that reduce the amount of domestic fuelwood needed, such as the improved stoves project (which decreases the use of both coal and wood), and also the production of briquettes as an alternative fuel.

Elimination of excess processing capacity. Steps are being taken to reduce the number of operating forestry busi-

Box 4. Potential Governance Responses to Illegal Logging

Prevention

- Measures to combat corruption through administrative procedures or fiscal control
- Measures to increase transparency in the allocation of concessions and timber sales
- Simplification of administrative procedures and elimination of discretionary powers
- Institutional reforms (separation of control and management functions)
- Increasing the supply of legal timber / providing alternative sources of energy
- Increasing information and awareness
- Increasing civil society participation at different levels
- Providing secure land tenure or forest use rights for communities
- Alternative income generation in rural areas
- Promoting demand-side measures (corporate codes of conduct, use performance bonds, certification, legality verification, elimination of excess capacity)

Detection

- Improved information management systems to detect violations (e.g. statistical systems that detect inconsistencies)
- Use of satellite-based monitoring to detect illegal logging
- Independent monitoring of forest operations and transport
- Financial auditing of forest administrations and state forest enterprises
- Making information related to forest operations (concessions, logging permits etc.) publicly available

Suppression

- Strengthening police capabilities in remote forest areas
- Increasing capacity of forest crime investigators to put together comprehensive cases
- Improving awareness of prosecutors and judges on the importance and consequences of forest-related crimes
- Building the capacity of prosecutors and judges to prosecute/convict forest offenders (e.g. by using environmental and/or money laundering-related legislation
- Adjusting penalty codes for forest-related crimes
- Increase transparency and establish public monitoring of enforcement operations and judicial processes.

nesses. Of the over 100 companies that applied for new or extended licenses to operate in 2005, only 48 were successful. In 2005, the capacity of MG Wood was reduced. This factory in Darkhan is one of Mongolia's largest, and was built with advanced technology. Even following this forced capacity reduction, the company operates at well below its full capacity. Many factories producing chopsticks have also been closed due to lack of raw materials. In 2006, SSIA, MNE, MIT, and forestry NGOs made a joint inspection of all forestry organizations in 33 soums in 14 provinces, determining which should be allowed to continue. Logging

companies were also issued guidelines to supply logged trees only to registered processing factories, and not to traders; this has become one of the requirements to receive an operating license.

Increasing legal supply. The government has also attempted to increase legal supply through waiving of customs duties and VAT on logs and timber being imported into Mongolia. There appears to be no evidence of an increase in imports over the last three years, although the quality of the statistics is poor and contradictory numbers were given when inquiries were made on different occasions. The imports should be monitored closely over the coming years. The supplies of cheap illegal timber from within Mongolia will depress market prices and make it hard for the imports to compete, even when tariffs are not imposed. Any real impact will probably depend on a decrease in the supply of illegal timber.

The government has tried to support the legal industry through providing soft loans to seven villages to revitalize the forestry sector there, but little impact has been reported. To be successful, greater opportunity for the legal industry to operate has to be promoted, since with the current boom in illegal supply, it is hard for legal enterprises to operate. The AAC is in theory currently identified by Mongolia's scientific institutions (although in practice it is kept the same each year). It is set by MNE, which then allocates quotas to the aimags. This decision is now discussed at a meeting of the minister's board to provide more oversight, but there are still major problems at all stages. Recent interviews with MNE officials revealed that there is a recognition that the AAC has been set at an unrealistically low level, and some attention is currently being given to the scientific basis on which this was made. In addition, mention has been made of the possibility of increasing domestic wood supply at the aimag and soum level through forest cleaning and thinning activities.

Providing secure land tenure rights or forest use rights for communities. Although communities are legally allowed to collect fuelwood and timber for private use, they must do so by obtaining a new permit each year, and have no long-term control over their local forest resources. Resolution No. 125 provides an opportunity for leasing forest reserves to business entities and local residents; however, it focuses on the responsibilities of the forest users, and does not fully address the rights of and benefits to those leasing the forest. In 2005, an amendment to the Law on Environmental Protection clarified the rights of a community group (nokhorlol) to own and sustainably use the natural resources they are conserving through a time-limited and condition-framed contract. In 2006, a new model of the contract for community-based NRM (Order No. 114, MNE), which MNE hopes will better address these issues. This form of agreement is still in its infancy.

Institutional reforms (separation of management and control functions). In 2002, the Government of Mongolia united all ministry-level inspection units into the SSIA, which at that time was under the prime minister's office, although it has now become an independent ministry. Separating the control function from MNE, the management institution, was an important step toward establishing an independent inspections system. However, in February 2005, the Office for the Coordination of Wood and Wood Materials Inspections was established in MNE. This was an attempt to bring back some of the control function. The Ministry of Justice and Internal Affairs later found the Office to be in violation of Mongolian law, which puts the responsibility for inspections firmly with the SSIA, and in February 2006 the Office was abolished. Interviews with MNE staff revealed that there are still differing views on whether this inspection function should be within MNE or not.

Increasing information and public awareness. MNE has participated in pilot programs with a variety of different international partners using a wide range of media at local and national levels. The challenge remains to scale this up, and to make information available on a sustained basis.

Increasing civil society participation. Around 40 NGOs now operate in the forestry sector. According to the new amendments to the Law on Environmental Protection, there should be increased opportunities for both these and also community groups to participate more fully. SSIA is increasing its cooperation with civil society groups, and intends to work more closely with NGOs in the future. The Mongolian Forest Society and Forest Association recognized these efforts by awarding a "Certificate of Gratitude" at the beginning of 2006 to SSIA for cooperating with NGOs.

Alternative income in the rural areas. The government has invested in pilot projects for alternative income generation, focusing on promoting crafts, increasing value-added products for livestock through processing raw materials, and production of vegetables. However, these pilots have not been systematically targeted to areas where illegal logging has been identified as a particular problem (such as former forestry towns). They remain on a small scale with limited impact to date.

Detection

Recently, the government has increased the emphasis on high-profile inspections, and MNE has been cooperating with the SSIA. However, the impact of this strategy to date appears to have been negligible, and in reality illegal logging activity has failed to decline. For example:

- Following the tightening of controls, the quantity of illegal timber entering Ulaanbaatar decreased for a time but eventually climbed back up to its former level—although the amounts paid in fines and bribes had increased.
- The cost of wood in 2005 increased by a factor of two to three over its cost in the previous year. Although it is understood that this increase is due to the reduction in the timber supply, in reality it reflects the increased risks and costs assumed by illegal timber traders.
- If the supply of wood, and in particular timber, to Ulaanbaatar City had actually decreased, wood product manufacturing would have slowed. Yet manufacturers apparently continue to work at normal levels.

Improved management systems to detect violations. In 2005 the now-defunct Office for the Coordination of Wood and Wood Materials Inspections in MNE, with assistance from the International Development Research Center, started compiling a database on legal violations, but the current situation is not clear.

Use of satellite monitoring to detect illegal logging. Mongolia does not yet make use of the technology available to monitor its forest resources. Satellite imagery is not used in forest inventories, let alone to detect illegal logging. However, a remote sensing laboratory was established in 2005 in the Department of Ecology of the National University of Mongolia, and the head of the Supervision Department for Environment, Geodesy and Cartography of SSIA is basing her PhD research on the possibilities of using satellite imagery in the forestry sector for Mongolia.

Independent monitoring of forest operations and transport. The SSIA has started to cooperate with some NGOs to create "Volunteer Inspector" positions, although this has not yet begun in earnest. Independent monitoring is intended to be conducted through "Irves" (see below). The government has also expressed interest in establishing an "ecological police force" as independent monitors of the inspection service.

Increasing capacity and resources for inspections. SSIA recently increased the number of state inspectors in charge of forests from one to four. In cooperation with a GTZ project, it plans to establish a specialized forest protection scheme named "Irvis" which draws on the experience of an NGO in the forestry sector. Recently, fuel and a vehicle have been specifically allocated to the forest unit of Ulaanbaatar's Specialized Inspections Office for forest inspections.

Inspections of transport by rail have been facilitated by a requirement to unload timber transported by railway only at crossing No. 44. To prevent timber from being falsely declared as fuelwood, a new regulation requires that fuelwood now must be cut into 50-cm lengths before it can be brought into Ulaanbaatar and the aimag centers. However, this regulation is not being rigorously enforced; wood continues to be transported into Ulaanbaatar in two-meter lengths and declared as "fuelwood," and in some cases loads of timber are hidden below layers of correctly cut fuelwood. In fact, this restriction is likely to be lifted, as it is difficult to enforce. There have also been complaints that the wood cannot be used for any other purpose, such as domestic construction. The restriction will likely be returned to 2.2 m.

Financial auditing of forest administrations and state forest enterprises. State forestry enterprises have now been privatized. Although inspections are required, these are not often carried out.

Making information related to forest operations publicly available. Details regarding forest operations are considered, at least in theory, to be public information.

Some information, such as the AAC for each aimag, and reports of illegal logging, are published in the press and occasionally through websites, but this is not yet done in a systematic fashion or made available from a single, consolidated source. In practice, information on more sensitive issues, such as the tender process and granting of timber harvesting allocations to logging companies, is not accessible by the public. Changes in this area may occur within the government's new World Bank-financed Governance Assistance Project.

Suppression

To date, the government has made some legal changes to enable easier prosecution of criminals and the suppression of illegal logging, but there remains little capacity to make use of these laws, nor is there much political will to tackle the problem.

Adjusting penalty codes for forest related crimes. Several amendments have been made to laws to increase the penalties for forest crime. For example, an amendment to the Law of Natural Environment Conservation allows the confiscation of trucks and cancellation of permits of illegal loggers. An amendment to the Forestry Law (2002) allows fines for damage to be based on an environmental impact assessment, and further decrees have set minimum values for damaged forest wood. MNE Order no. 61—"Adoption of ecological/economic assessment of the loss of forest resources"—allows fines to be based in accordance with market values, which are determined following comparison with prices in neighboring countries. Implementation of this order has been slow to date, and in practice the previous order on this topic (2002) remains in force.

Increasing capacity for prosecution. Although there is legislation in place, in reality there is very little prosecution. Police in remote areas are few and far between, and have no training on how to deal with these crimes. There are no forest crime investigators who are specifically trained to put together cases against those in the illegal logging networks. Although some training courses and workshops for members of the judicial and legal system have been conducted, there is still little awareness on the part of prosecutors and judges regarding the importance of forest crime and the legal mechanisms for dealing with it.

5. Recommendations

The Government of Mongolia has taken some positive steps toward curbing illegal logging. However, it is clear that much work still remains to be done.

Increasing Political Will

Mongolia is a member of the Europe and North Asia Forest Law Enforcement and Governance (FLEG) process, and participates in this regional drive to tackle forest crime. In recent years, illegal timber trade has also been given more attention within the country, with strengthened inspections and rearrangements of the government departments to place the forestry coordination unit at a higher level within the hierarchy. However, the political will to tackle this situation in a sustained and coordinated fashion is still not especially apparent, and the government forestry sector remains underfunded and limited by low capacity and inadequate resources. Greater recognition needs to be made of the economic and environmental benefits of a well-managed forestry industry, with investment in the sector made accordingly. Much of the necessary legislation and management agencies are already in place, and improvements could be rapidly made if the political will were present. This would be indicated most clearly by appropriate budget increases.

Tackling Lack of Accountability and Corruption in the Forestry Sector

The lack of success in controlling this industry is due in part to the bribery and corruption endemic within it. As neither local governments nor MNE are held accountable for the state of the forests, there is currently little incentive to improve the situation. One way forward would be to establish a compulsory case-tracking system, where every incident of potential illegal logging or illegal trade would be recorded. In this manner, it would be evident when cases are dropped part way through the investigation—often for dubious reasons. The number of cases that are successfully resolved could be tracked and this information made public.

It should be noted that many of the employees within the forestry sector are honest and hardworking people, who are frustrated at the constraints they face. Greater support needs to be given to these staff. This could include establishing a safe mechanism for reporting corruption or illegal activities with protection and anonymity for "whistle-blowers," and would require appropriate legislation. The government could also consider a system of incentives for information that leads to successful prosecutions. First steps have been taken towards these developments with the

amendments to the Law on Environmental Protection (November 2005)—implementation should be monitored closely, and changes made as needed to ensure an effective system. In addition, government officials need to be paid at rates high enough to encourage honest, ethical behavior. Those at any level who engage in corrupt practices must be punished to the full extent of the law.

Strengthening Prosecution

The case-tracking system described above would have additional benefits in terms of strengthening prosecutions because there is a gap between the legislation and what happens in reality. Implementation of a case-tracking system, especially if made publicly available, would allow critical points within the justice system to be targeted, as it would reveal at which stage of the process cases are dropped, and highlight where the bottlenecks are to successfully convicting criminals.

For those involved in the legal system, it is important to improve awareness of the charges and penalties available under environmental law and the importance of pursuing these cases. Mongolia currently has no environmental investigators who are charged with building complex cases and pursuing them. The technical capacity and knowledge of those in the justice system needs to be strengthened, to allow them to utilize the existing environmental legislation and prosecute to the full extent of the law.

Improving Policies and Coordination of Management Strategies

The management of forestry in Mongolia has undergone frequent reorganization as government departments and ministries shift and recombine. Emphasis needs to be placed on improving coordination and cooperation within the structure that currently exists and eliminating overlap of responsibilities among public organizations, rather than undergoing further reorganizations, which tend to demoralize staff without making any clear improvements.

Regarding the policies put in place for the management of forest resources, a clear distinction needs to be made between the approach necessary to manage production of fuelwood and domestic use timber, and that required for the management of industrial timber production. These two activities operate in very different contexts in terms of the actors involved and their motivations for participating. In both cases, it is important to ensure that the focus of sector management is balanced and addresses both limiting supply and regulating demand. Policy decisions should be guided by sound research results and economic assessments, using the advice of professionals that prioritizes the interests of the sector (both communities and industry).

Given the large proportion of timber consumption that is due to fuelwood use, a greater amount of attention needs to be paid to this area. The Government of Mongolia should develop a national fuelwood supply and demand management strategy, which covers supply to urban areas, and also addresses the need for fuel efficiency. Initiatives and activities aiming to reduce or replace the volume of timber harvested for fuelwood or domestic use should be supported.

In the case of industrial timber, a more attractive legal and regulatory environment should be created for investors to allow them to operate legally within the sector, with realistic harvest permits issued and the elimination of regulations that are unnecessarily stringent or confusing and hinder efficient operations in the industry.

Improving Utilization of Timber and Management of Forest Resources

Although there is an urgent need for companies to be able to work legally in the sector, and opportunities to do so must be provided, it should be recognized that in recent years there has been a proliferation of businesses in the forestry sector, most of which currently work illegally. Many of these companies are working inefficiently, as cheap supplies of illegal timber provide no incentive to reduce wood consumption. In addition, the cumulative processing capacity of these companies is beyond what can sustainably be harvested from Mongolia's forests in the long term. It is therefore desirable both to reduce the number of operators, and ensure that those that remain and receive permits are demonstrably professional and efficient. The government could achieve the former by increasing royalties

Sawing timber at one of Ulaanbaatar's many markets. Image: Bryony Morgan, May 2006.

on legally felled timber, and reducing the supply of illegal timber. Only the most efficient operators will be able to stay in business. This will encourage the adoption of less wasteful timber-cutting technologies. Secondary permits should be provided for the use of sawmill offcuts, so that these are utilized and not treated as waste.

It is generally thought more effective to downsize an industry and increase its efficiency through tax disincentives rather than by introduction of incentives; the latter almost always creates unintended market distortions. The government should also encourage increased production of value-added timber goods; creating tax disincentives for the use of large amounts of timber should also have this effect. All commercially valuable wood products should be subject to appropriate taxes, including fuelwood and poles used in construction. The latter are typically the densest, strongest wood available, and are often cut from the many thin trees that grow in dense forests where competition for nutrients and water is high, and hence growth is suppressed. These are very useful and valuable to the construction industry, and should be recognized as such.

Increasing wood prices by restricting the supply of cheap illegal timber and implementing royalties will also have the effect of altering people's choices when it comes to consumption. A reduction should accordingly be seen in consumption, with a corresponding increase in use of wood alternatives. For example, increased royalties could cut down on the affordability of plank fences in urban areas, causing a shift to small round wood, or live hedging (e.g. *Caragana*) which might stimulate an urban re-greening industry.

During these changes, the government should be aware of, and support, those people whose livelihoods would be negatively affected. In particular, a program with international support should be developed to address livelihood and social issues in former forestry

towns, many of which have a large proportion of residents illegally involved in the forestry industry. In addition, if further royalties are introduced on fuelwood, the poorest people who rely on supplies of cheap or free fuelwood need to be be supported. This could be through free or subsidized harvesting permits or supplies of fuelwood, or through schemes that provide alternative fuel.

Management of forest resources *in situ* and production of timber could also be improved. This may require investment in the creation and maintenance of logging roads in areas with timber reserves to reduce pressure on the accessible stands of timber near urban areas. However, if this is not accompanied by increased inspection and enforcement capacity, with proven effectiveness, this would provide more opportunity both for illegal logging and for the extraction of non-timber forest products, and thus must be undertaken very slowly and carefully. Forests should be managed under long-term plans that identify the appropriate harvestable forest areas and optimum harvest rate, not the year-to-year plans that are currently developed and are usually not followed. Industrial use of relatively abundant and fast-growing species such as birch could also be increased, as these trees are currently not often utilized. A large amount of timber is available from regular, managed forest cleaning and thinning activities, which are required to reduce fuel loading of the forests and make them more fire resistant. The biomass produced must be utilized effectively, for production of timber for construction and fuel supplies.

Focus on Training and Human Resources

Although the number of employees in the rural areas is far below the levels required to supervise and manage forest resources efficiently, a greater impact can be obtained through improved training and efficient use of human resources. Training is crucial for new recruits to environmental inspection and law enforcement agencies, and also important for NGO workers. Operational guidelines should be improved for forest rangers and inspectors. It is important to recruit those who have a passion for environmental protection. Professional ethics and attitudes to the environment should be taken into account in hiring decisions. The recent amendments to the Law on Environmental Protection (November 2005) state that only university graduates with appropriate training or work experience may be hired as general state environmental inspectors, and that rangers must have completed a training course from an education institution licensed by the state administration to conduct environmental training. In addition, the amendments fix maximum areas of land for which a ranger can be responsible. Implementing these amendments would be a positive step.

Increase Transparency, Public Participation, and Awareness

Improving transparency by granting increased civil society oversight is not only an opportunity to increase accountability and prevent corruption, but also an opportunity for those charged with managing the forestry sector to show how decisions have been made, and demonstrate where allegations of improper actions are in fact misguided. The Government of Mongolia is embracing this concept, and is embarking on projects to increase public access to information through websites and other media. Much of this information is already available to the public, but not readily accessible. In addition to increasing access to information, the government should further increase opportunities for local communities, NGOs and faith groups to participate directly in the control and monitoring of forestry activities.

More attention needs to be paid to improving the knowledge of the general public about the problems of illegal logging, and the ways in which they can act to stop it. Public awareness of conservation issues can be raised through targeted publicity campaigns. There may be a need to establish a public forestry information and training center, although it is important that this has a degree of independence and does not uncritically promote government policy. One of the universities might fulfil this function.

Many of the factors that have permitted the expansion of illegal logging to occur—such as uncertain forest use rights, poverty, and unemployment—provide a rationale for the devolution of management control to local communities. Greater involvement of those who rely on forest resources for their livelihoods and subsistence should increase their incentives to demand effective management. The Government of Mongolia

has made some progress in providing a legal basis for this involvement, and has recently developed new forestry legislation that provides greater opportunities for community involvement. Further regulatory work will need to be done to complete the process; for example, community groups are currently intended to be "unregistered" bodies which will present numerous obstacles to their operation, as they will have not have the status of a legal entity under Mongolian law (for a full discussion, see Wingard and Zahler, 2006). Although the implementation of community forestry projects in Mongolia, with its nomadic culture, would be challenging, the potential benefits of this approach are great and these options should continue to be explored. Providing transparent, long-term land use and timber harvest contracts to communities and the private sector—addressing both benefits and responsibilities of all parties involved—should increase the likelihood of responsible forest management. By increasing the chances for communities to have ownership and responsibility for, and to benefit from, their forests, there is a better chance that the ancient Mongolian tradition of conserving and respecting the forest can be revived.

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Appendix A

Table A1. Forestry Sector Companies in Mongolia (June 2004)

	MIT	NSO	NTA
Arkhangai	6	9	25
Bayan-Ulgii	—	7	14
Bayankhongor	—	1	7
Bulgan	19	19	27
Govi-Altai	—	2	8
Zavkhan	8	9	31
Khentii	9	3	21
Dornogovi	—	2	7
Dornod	3	3	17
Dundgovi	—	3	11
Tuv	3	4	19
Orkhon	3	7	31
Umnugovi	—	3	14
Sukhbaatar	—	1	3
Selenge	31	35	89
Darkhan-Uul	9	2	9
Khuvsgul	3	10	28
Uvurkhangai	2	7	38
Uvs	—	2	5
Khovd	—	2	2
Subtotal for aimags	90	131	406
Ulaanbaatar	66	61	272
National total	156	192	678

Appendix B

Table B1. Survey of Wood and Forestry Products Companies in Mongolia

		Nationwide					Ulaanbaatar				
	Category of production	NGO	Up to 10 million Tg capital	From 10 to 50 million Tg capital	Over 50 million Tg capital	Total	NGO	Up to 10 million Tg capital	From 10 to 50 million Tg capital	Over 50 million Tg capital	Total
1	Producers of construction materials and components	—	77	68	30	175	—	28	29	20	77
2	Producers of other wooden and woven products	—	112	76	19	207	—	47	36	10	93
3	Producers of wooden panels	—	23	16	9	48	—	16	13	6	35
4	Producers of wooden crates and containers	—	20	15	1	36	—	15	10	1	26
5	Producers of timber	—	46	66	11	123	—	10	10	—	20
6	Logging companies	5	42	39	3	89	2	7	8	2	19
	Total	5	321	280	73	678	2	123	106	39	270
	Subtotal (excluding logging companies)		279	241	70	589	0	116	98	37	251

Appendix C

Table C1. Wood Required for the Construction of a Livestock Pen (m^3)

		Required wood	Of which:	
			Enclosed	Unenclosed
1	Fence with shed	3 cm boards	1.6	2.9
2	Side walls (2)	3 cm boards	1.1	—
3	Rear wall	3 cm boards	1.35	—
4	Roof	3 cm boards	4.8	—
5	Pole or support pillar	15 cm round pole	1	0.5
6	Total		9.83	3.4

Calculated with the help of a livestock-owning forest ranger.

Table C2. Wood Required for the Construction of a Private House (m^3)

		Required wooden materials	One-storey wooden houses in ger areas, 6×8 m	Two-storey summer houses in suburban complexes , 10×12 m
1	Load bearing wall	15 cm rough-sawn boards	11.76	35.0
2	Ceiling	3 cm boards	1.44	4.5
3	Floor	5 cm boards	2.4	6.0
4	Roof	3 cm boards	2.42	4.65
5	Support	15 cm rough-sawn boards	1.4	5.0
6	Total		19.2	55.15

Calculation made by engineers from the Urban Services Improvement Project, Ulaanbaatar.

Appendix D

The Government of Mongolia has taken action at many levels to directly and indirectly bring illegal timber harvesting under control. However, the desired outcomes have not always been achieved, for the reasons described below.

Table D1. Laws and Resolutions of Parliament

Date	Law	Action	Implementation, Positive and Negative Outcomes
May 19, 1995	Law on Royalties for Timber and Fuelwood	Royalties go to the local budget. 85 percent of revenue is used for forest recovery.	Royalty issue was legalized.
May 28, 1996	Law on Preventing Forest and Steppe from Fire	Forest and steppe fire prevention measures are legalized.	Monitoring results unavailable.
Jan 8,1999	Law on Custom Duties Applicable to Exported Wood and Timber	End of exports of uncut timber	Export of uncut timber has ceased. No negative outcomes.
Jan 27, 2000	Amendment to the Law on Royalties for Timber and Fuelwood	Changes to fees in connection with market prices.	Implementation is ongoing.
April 14, 2000	Joint Order No.67/62 of the MIT and MSWL 30 April, 2003 Action program for the revival of the timber industry, to solve employment and social issues affecting inhabitants of logging villages	To revitalize the timber industry, 15 million Tg in soft loans were distributed to the seven villages involved in the program. This comprised 10 million Tg from MSWL to support employment, and an additional 5 million Tg from MIT, for supporting small and medium enterprises in each village.	It was reported that 2,000 permanent and/or temporary jobs were created. In reality, no noticeable changes were felt.

Jan 27, 2000	Amendment to the Law on Forestry	MNE instituted permits for those harvesting timber for industrial and private use	Permits enable MNE to impose some controls on the activities of aimag and soum governors who abuse their authority. It has also become easier to inspect illegal logging activities. Centralization, bureaucracy, and corruption were created.
Jan 28, 2000	Law on Reinvestment of Natural Resource Use Fees	The financial source for budgetary allocations for environmental conservation activities was identified. Percentages for reinvestment into conservation of the resource were set as: • 30 percent for natural plants • 85 percent for timber and fuelwood • 50 percent for hunting • 30 percent for land fees • 35 percent for water	Analysis of budgetary allocations for wildlife management by MNE indicated that this law was not adhered to (Wingard and Zahler, 2006). Analysis of budgetary allocations for forest management has not been undertaken for this report, but it is thought that the law has not been strictly followed in this case either.
April 25, 2002	Amendment to the Law on Forestry	Fines for damage caused to the forest through illegal logging can be based on an environmental impact assessment.	Illegal logging rarely results in a substantial fine.
April 25, 2002	Amendment to the Law on Nature Conservation	Effective provision to enforce the law. Illegal logging could result in confiscation of trucks and cancellation of permits.	Implementation seems mediocre so far. In the two years after the amendment came into force, no accounts were settled with any business entity and apparently only one truck was confiscated.
Jan 27, 2005	Amendment to the Law on Customs Tariffs	Customs duties were waived on logs and on timber being imported into Mongolia	Currently an effective wood import system has yet to become established, and as a result of the relatively low cost of domestic wood and other factors, the quantity of wood imports has not reached the required level. MNE is taking intensive action to organize these actions in a unified manner and to support business owners.
Nov 18, 2005	Amendments to the Law on Environmental Protection	This amendment made provision for the setting up of community organizations for the management and sustainable use of natural resources, and also for the employment of voluntary rangers.	Implementation should be monitored, in particular to identify obstacles to community-based NRM which require further work. As a follow-up to this, an order was issued in Jan 2006 by MNE on the employment of voluntary rangers.

Table D2. Government Resolutions

Date	Resolution	Action	Implementation, Positive and Negative Outcomes
Dec 6, 1995	Regulation on conducting forest inventory	Provided framework for forest inventory.	Hampered by severe human and financial resources constraints
Dec 18, 1996	Percentage of discounting royalties on timber and fuelwood by forest cleaning	Changes of discounts	Discount provided up to 30–40%.
July 22, 1998	Resolution No.125. Regulations for leasing forest reserves to business entities and local residents.	Currently, 29 communities of local residents have signed forest-use contracts	The attitude of business entities and individuals toward the forest in their tenure has improved significantly. They have become proactive regarding forest replanting and conservation. Although the regulation very clearly sets out the responsibilities of forest users, it has been criticized for its failure to address the rights of and benefits to leasers, leading to unsatisfactory implementation.
13 Oct 1999	Resolution No. 163 Amendment to fees for timber and fuelwood	Changes in fees in connection with market prices.	Cancelled by the Gov. Resolution No. 147 dated 29 June 2006.
Nov 22, 2000	Resolution No. 181. Approving Aimag governor's office structure	Approve aimag environmental agency structure.	Aimag environmental agencies established.
Oct 31, 2001	National Forestry Program	National Forestry Committee, headed by the Minister of Nature and Environment, was established to be in charge of implementing this program. A five-year action plan was approved.	So far no visible outcome.
Jan 13, 2001	Resolution No.03. Concerning permission for the processing of timber to be used for export products	Government export of industrial timber	Failed to be implemented, cause unknown.
December 2004	Government Resolution No.236 (2004), Program for structural reorganization of MNE	Establishment of the Forestry Policy Coordination Department within MNE	The basic responsibility of MNE Forestry Policy Coordination Department is the development of forestry-sector policy. This performance of this basic role remains unsatisfactory, and no significant actions have been taken to bring about important changes in this sector. The department mainly undertakes action to fight illegal logging, participating directly in inspections.
29 June 2006	Resolution No. 147 Amendment to fees for harvesting timber and fuelwood	Changes in fees in connection with market prices.	New fees have been applied.

Table D3. Orders of the Minister of Nature and Environment

Date	Regulation	Action	Implementation, Positive and Negative Outcomes
Aug 31, 1995	Guideline on boundaries of timber areas	Technologies for timber harvesting determined by professional organizations. —FWRC and Aimag Env. Agency	Implementation is ongoing.
Dec 26, 1995	Regulation on planning and financing reforestation and forestry activities	Reforestation is planned and financed.	Many problems exist in the execution of the plans.
July 15, 1995	Transferring of reforested area to state forest fund	Official transfer of reforested areas to the state.	Joint commission set up between MNE and aimag representatives. Forest inventories updated.
Dec 30, 1997	Regulation on forest cleaning and thinning	Technology for forest cleaning and thinning approved	The technology is not applied to large areas due to financial constraints.
Feb 16, 1998	Identification of alpine zone	To take these areas under protection.	MNE determines the alpine zone for protection purposes.
Dec 15, 1998	Model norm of cost of 1 ha forestry activity	Apply a standard cost for 1 ha of reforestation.	100,000 Tg for Khangai region 135,000 Tg for Gobi region
Jan 7, 2000	Introduction of Certificates of Origin for raw timber	MNE began issuing permits to businesses for the preparation of timber	Implementation unsatisfactory.
Dec 15, 2000	Regulation of permission to log trees for fuelwood and commercial timber.	MNE began coordinating the issuing of permits for logging in that year	Unfortunately, it has been reported that even staff from MNE itself have violated some provisions of this regulation.
Jan 12, 2001	Regulation of sale of industrial timber, fuelwood, and timber as a raw material in the capital city, aimag centers, and other settlements.	Timber sales and inspections became subject to official regulation	Implementation has been inadequate. The original objective of controlling illegal wood through official markets could, theoretically, make control and inspection easier, but has ultimately facilitated the work of illegal traders, with the establishment of branches of their networks at each site.
Jan 15, 2001	Decree No. 23 Concerning the Modification of the Permit to Prepare Fuelwood	Fuelwood preparation permits were revised and given nationally registered numbers, and employed in the manner of securities	This decree was an important step forward in putting controls on the quantities of permits issued by local authorities and forest rangers, and helping to stop the illegal logging and transport of timber using various types of documents allegedly for fuelwood preparation. The fees for preparing timber and fuelwood were also increased. In some areas an artificial demand for these permits has emerged, and the illegal sale of permits has begun.
Feb 12, 2001	Decree No. 38 Approval of rules and regulations of Environmental Agencies	Functions of Environmental Agency are identified.	Ongoing

Date	Regulation	Action	Implementation, Positive and Negative Outcomes
May 28, 2002	Introduction of Certificates of Origin for raw timber	Replaces order of Jan 2000 to monitor transportation and sale of timber.	Ongoing
March 18, 2003	Approval of Natural Resource Forest and Water Agency rules, business plan, budget and staff	Approval of Natural Resource Forest and Water Agency rules, business plan, budget and staff	Agency has since been split into the FWRC and the Water Authority.
Nov 15, 2004	Regulation on issuing licenses for timber and fuelwood, usage, and monitoring transportation	To regulation licences for timber and fuelwood, usage, and monitoring transportation	The standard cerficiate is modified. Licences for timber and fuelwood is separated. See the report for decriptions of the problems.
February 2005	Decree of the Minister of the Environment, Concerning the Establishment of an Office for the Coordination of Wood and Wood Materials Inspections under MNE	The Office for the Coordination of Wood and Wood Materials Inspections established under MNE to register and inspect wood and wood materials entering Ulaanbaatar, as well as the wood markets operating in the city.	In the initial period inspections improved, and the illegal timber brought into Ulaanbaatar in the spring months actually decreased. But the illegal timber trade intensified in June and July, eventually reaching its former levels. This is connected on the one hand with the weakening of the workforce of this office, and on the other hand with the presidential elections and the Naadam national holiday.
March 9, 2005	Decree No. 61 of the Minister of the Environment, Concerning the Ratification of Assessments of Damage to Forest Resources	With this decree, the minimum assessed ecological and economic value for one cubic meter of damaged forest wood was set at 250.0 thousand Tg, with additional fines charged on the basis of the forest zone, the species of tree, and yield.	The establishment of this new model for assessing the value of damage caused by illegal logging has made a start toward enforcing the repayment of damages, establishing the foundation for prosecution by judicial and administrative authorities, and valuing wood at the same level as neighboring countries. Many people believe that this measure has artificially raised the price of wood and provided an incentive for illegal logging. But this resolution is not being implemented, as Decree 93 (2002) of the Minister of the Environment "Concerning the Ratification of Ecological and Economical Value of Forest Resources" remains in force.
Jan 23, 2006	Decree No. 24. Regulation on employing voluntary ranger and introduction of award system	To implement the Amendment to the Law on Environmental Protection.	Ongoing.
April 26, 2006	Decree No. 114. Regulation for community groups (*Nokhrolol*) for community-based NRM, sample contracts and certificates	To implement the Amendment to the Law on Environmental Protection.	Implementation not yet begun

Table D4. Actions of the Office of Specialized Inspection and Others

Date	Action	Implementation, Positive and Negative Outcomes
2002	Resolution No.A/177 Concerning Collaboration Between the Office of Natural Environment Conservation and the Chairman of Ulaanbaatar Railway Authority	The approval of the requirement to unload the timber transported by railway only at crossing No.44 facilitated inspection activities. Wood can be unloaded at different places if the thieves conspire with railway employees.
2003	Creation of "Volunteer Inspector" positions	The Office of Specialized Inspection started to cooperate with certain NGOs to control illegal activities to expand the scope of the controlling activity. In some cases, authorized volunteer inspectors have reportedly abused their authority and become involved in conspiracies with the timber thieves.
2003	Establishment of the independent inspection structure	Separating the specialized inspection role from the ministries and making it subject to the Prime Minister's administration was an important step toward establishing an independent inspections system.
Nov 15, 2004	Resolution No.54 of the National Council on Standards and Measures. Fuelwood technical standard No. 5413-2004. Fuelwood brought into Ulaanbaatar and aimag centers must be cut into 50-cm lengths	This measure has made an important contribution to stopping the illegal supply in Ulaanbaatar of timber in two-meter lengths declared as "fuelwood." On the negative side, the demand for timber has increased. Previously people would use dry fuelwood for various simple building projects and use the remainder as firewood. Now, however, unseasoned timber is being used for even the simplest applications.

Environment and Social Development
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