

Forest sector financing flows and economic values in Mongolia

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List of Acronyms

CDM	Clean Development Mechanism
CER	Certified emission reduction
CPF	Collaborative Partnership on Forests
FAO	Food and Agriculture Organization of the United Nations
FUG	Forest user group
GDP	Gross domestic product
MED	Ministry of Economic Development
MEGD	Ministry of Environment and Green Development
MIA	Ministry of Food, Agriculture and Light Industry
MNT	Mongolia Tugrig (at the time of writing, US\$ 1 = MNT 1,391)
MOF	Ministry of Finance
MRTT	Ministry of Roads, Transport and Tourism
NSO	National Statistical Office of Mongolia
NTFP	Non-timber forest product
PES	Payments for ecosystem services
PFE	Private forest enterprise
REDD+	Reducing Emissions from Deforestation and Forest Degradation in developing countries
SEU	Sheep equivalent unit
SFM	Sustainable forest management
SME	Small or medium-sized enterprise
SPA	Special Protected Area
UNCCD	United Nations Convention to Combat Desertification
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNFF	United Nations Forum on Forests
WTTC	World Travel & Tourism Council

Executive Summary

This report presents the findings of a study on forest sector financing flows and economic values in Mongolia. The study intends to provide information to complement and feed into the national REDD+ strategy and readiness roadmap which is currently being prepared by the Government of Mongolia with support from the UN-REDD Programme. The aims of the study are to analyse the economic value of the forest sector and related public financing flows, so as to identify point to potential entry points to mobilise additional financing for sustainable forest management and increase its effectiveness and impacts.

Findings on forest sector values:

- At current harvesting levels, timber and fuelwood may have an annual sale value of almost MNT 200 billion (US\$ 142 million), and generate MNT 66 billion (US\$ 48 million) in operating profits to producers. Just over half of this value comes from unlicensed removals.
- Non-timber forest product collection has a total value of almost MNT 16.5 billion (US\$ 12.18 million) a year, spread over around half of the rural population in soums with boreal forest. More than 90% of this value comes from unlicensed removals, and three quarters is accounted for by home-consumed products which never enter the market.
- Forests provide an important seasonal source of pasture for livestock, to a value of more than MNT 34.5 billion (US\$ 24.70 million) contribution to herders' gross margins. This comprises up to 5% of the value of livestock production in soums with boreal forests.
- Hunting under permit in boreal forest areas generates products with an annual market value of between MNT 91 million (US\$ 65,000) if sold locally and MNT 2.7 billion (US\$1.9 million) if hunted for sport.
- Forest-based leisure tourism directly generates more than MNT 22.7 billion (US\$ 16.34 million) in visitor spending and sales, supports up to 6,000 jobs and wage earnings of MNT 18.31 billion (US\$ 13.17 million), and makes a direct contribution to GDP of MNT 55.26 billion (US\$ 39.73 million). Its multiplier effects across the economy are substantial: the total contribution to GDP may be in excess of MNT 144 billion (US\$ 103.75 million), including MNT 48.83 billion (US\$35.11 million) in wage earnings, MNT 93.86 billion (US\$ 67.48 million) in sales, MNT 28.07 billion (US\$ 20.18 million) in value-added and MNT 17.07 billion (US\$ 12.27 million) in capital formation.
- Forest watershed protection services in the Upper Tuul basin alone are worth MNT 27.2 billion (US\$ 19.6 million) a year to urban water users.
- The net value of forest goods and services to users calculated in this study is some MNT 395 billion (US\$284 million), equivalent to an average of MNT 40,000/year per hectare of the boreal forest estate (US\$ 28).
- The government earns more than MNT 36 billion (US\$26.3 million) in revenues from forest product harvesting and utilisation activities, including tourism and water but excluding the taxes paid by other forest-based enterprises. This is equivalent to an average of MNT 3,600/year per hectare of the boreal forest estate (US\$ 3).
- The net value-added to rural households from fuelwood use, non-timber forest product collection and forest grazing is equivalent to more than 12.5% of recorded per capita GDP
- The total annual direct value-added from the forest sector is equivalent to a figure that is around 3.1% the value of GDP, while the public revenues directly generated are equivalent to around 1.4% of all tax revenues.

Findings on forest sector financing:

- The Government of Mongolia provides funding to the forest sector of around MNT 12.5 billion (US\$ 9 million) a year. This equates to annual public spending of MNT 125,000/km² (US\$ 90) of boreal forest in total. On average, public spending on the forest sector is almost three times higher than the public revenues earned from timber, fuelwood and non-timber forest product harvesting.
- Public funding to the forest sector has been rising steadily, and more than doubled in real terms between 2008 and 2012. The share of forests in the total environment budget has however declined over the same period, from a third of all spending in 2008 to less than a fifth in 2012.
- Core institutional costs account for less than 10% of government forest spending, and are dominated by staff costs. More than 90% of the recurrent budget is allocated to on-the-ground forest management activities: pest control, fire management; forest cleaning, thinning and enforcement; reforestation and rehabilitation; inventory and forest organisation; nurseries and seedling preparation; and support to Forest User Groups.
- International donor assistance plays a relatively minor role in forest funding, at an average of MNT 2 billion (US\$ 1.5 million) a year or MNT 21,000 (US\$ 15) per km². The forest sector accounted for 0.1% of total bilateral and multilateral development assistance between 1990-2010, and just 3% of environmental spending.
- Most donor-funded forest sector projects have been initiated since 2005. The vast majority of activities concern on-the-ground forest management, development and conservation, with a particular focus on supporting community forest management.

Conclusions on funding coverage and effectiveness:

- The study has found that funding to the forest sector totals just under MNT 15 billion (US\$ 11 million) a year, or an average of MNT 146,000/km² (US\$105) of boreal forest. Meanwhile, a partial estimate of the economic value of boreal forest goods and services yields a figure of MNT 431.5 billion (US\$310 million) or an average of MNT 4,300,000/km² (US\$ 3,100).
- The values generated by forest goods and services can therefore be seen to be substantial in comparison to the funds invested. The government earns fiscal revenues of almost MNT3 for every MNT 1 of public budget allocated to forests, and every MNT 1 of combined government and donor funding helps to leverage broader benefits to the Mongolian economy worth just under MNT 30.
- Timber and fuelwood production accounts for less than a half of the estimated economic value of the forest sector. Forest values are spread across a wide range of beneficiaries (including herders, SMEs, large companies and urban dwellers), at many levels of scale (household, company, , city soum, aimag and national) and in multiple sectors (such as agriculture, industrial, manufacturing, tourism, energy and water supply).
- In contrast, forest budgets are focused on a fairly narrow range of “traditional” forest production and protection activities, not on securing the broader SFM and socio-economic development objectives which form a part of the stated goals for the forest sector.
- There is thus something of a disparity between the management activities on which forest funding is spent, and those which generate the highest economic values. The forest sector has an economic impact and potential which extends far beyond the current management and budgetary focus. This means that prospective investment sources and revenue streams remain untapped, and opportunities to further enhance the economic value-added of forest goods and services are missed.

- Various factors in addition to an overall lack of funds act to constrain more effective forest sector financing and value-addition, including: a narrow funding portfolio, weak application of user pays and cost recovery principles, uneconomic pricing and costing, weak financial and economic incentives for stakeholder engagement and investment in sustainable forest activities, and a disconnect between financial planning and actual operational management needs.

Recommendations on options to enhance sustainable forest management financing:

- Building diversified portfolios which better reflect the full range of goods and services associated with the forest sector is key to enhancing long-term sustainable financing for SFM, and increasing the effectiveness and impacts of forest funding.
- One aspect of financial diversification is to extend funding towards non-traditional activities and approaches which will allow a much wider range of values to be generated by forests, and a more diverse group of stakeholders to become engaged in and benefit from their management. The other is to find new ways of capturing these broader values as concrete investments and financing flows for sustainable forest management.
- To these ends, ten financing instruments and policy recommendations are suggested which can be used to mobilise additional funding for sustainable forest management, and increase financing effectiveness and impacts:
 1. Integrate forests into the spending of other sectors;
 2. Incorporate sectoral values into forest management budgets;
 3. Establish payments for forest ecosystem services;
 4. Introduce forest biodiversity offset funding arrangements;
 5. Enhance value-added from sustainable forest product markets;
 6. Mobilise credit and investment capital for SFM;
 7. Create enabling incentives for SFM;
 8. Rationalise forest sector fees and cost norms;
 9. Improve earmarking and retention of forest funds; and
 10. Harmonise financial and management planning.

INTRODUCTION:

study approach and scope

Aims and content

This report presents the findings of a study on land use financing flows and economic values in Mongolia. While many land and resource use sectors have some bearing on, and relevance to, REDD+¹ (for example agriculture, pasture, water and mining), the forest sector is of particular importance. The current work is focused on the forest sector.

The study was carried out under the auspices of the United Nations collaborative initiative on Reducing Emissions from Deforestation and Forest Degradation in developing countries (UN-REDD). It involved a review of available data and literature, as well as expert consultations and a stakeholder workshop held in January and April 2013.

The broader **context** for the study is to provide information to complement and feed into the national REDD+ readiness roadmap which is currently being prepared by the Government of Mongolia with support from UN-REDD. Its immediate **aims** are to analyse the economic value of the forest sector and related financing flows, so as to point to policy options and instruments for increasing forest sector financing through the public sector to sustainable forest management.

The **justification and need** for the study arises from the currently low policy, budgetary and investment priority accorded to the forest sector in Mongolia. This has implications for the implementation of the REDD+ roadmap – which will require substantial financing from various sources, including co-financing from the Government of Mongolia. REDD+ will also need to be linked to overall forest sector development and the national green development agenda in order to ensure successful and long-lasting outcomes. Providing in-depth information on the development and economic value of the forest sector is seen as an important means of increasing its importance in public policy and budgets.

To these ends, the study aims to answer four main questions:

- In **Chapter 2: review of forest sector-economic linkages** – what values does the forest sector generate in economic and development terms, and to whom and in what form do these accrue?
- In **Chapter 3: review of forest sector funding flows** – what are the main sources of financing for the forest sector, and on which goals and activities are funds being spent?
- In **Chapter 4: forest financing coverage and effectiveness** – how do the activities, sectors and groups to which forest values accrue compare with those from which forest funding is sourced and towards which forest funding is directed?
- In **Chapter 5: niches and opportunities to enhance financing for sustainable forest management** – what kinds of policies and instruments can be used to mobilise additional financing for sustainable forest management, and increase its effectiveness and impacts?

¹ Reducing Emissions from Deforestation and Forest Degradation (REDD+) is an expected international mechanism under the United Nations Framework Convention on Climate Change (UNFCCC) to provide positive incentives to developing countries to reward their efforts to reduce emissions from forestry, and for conserving, sustainably managing and enhancing their forests, as a considerable amount of CO₂ emissions from forestry and land-use change activities come from developing countries.

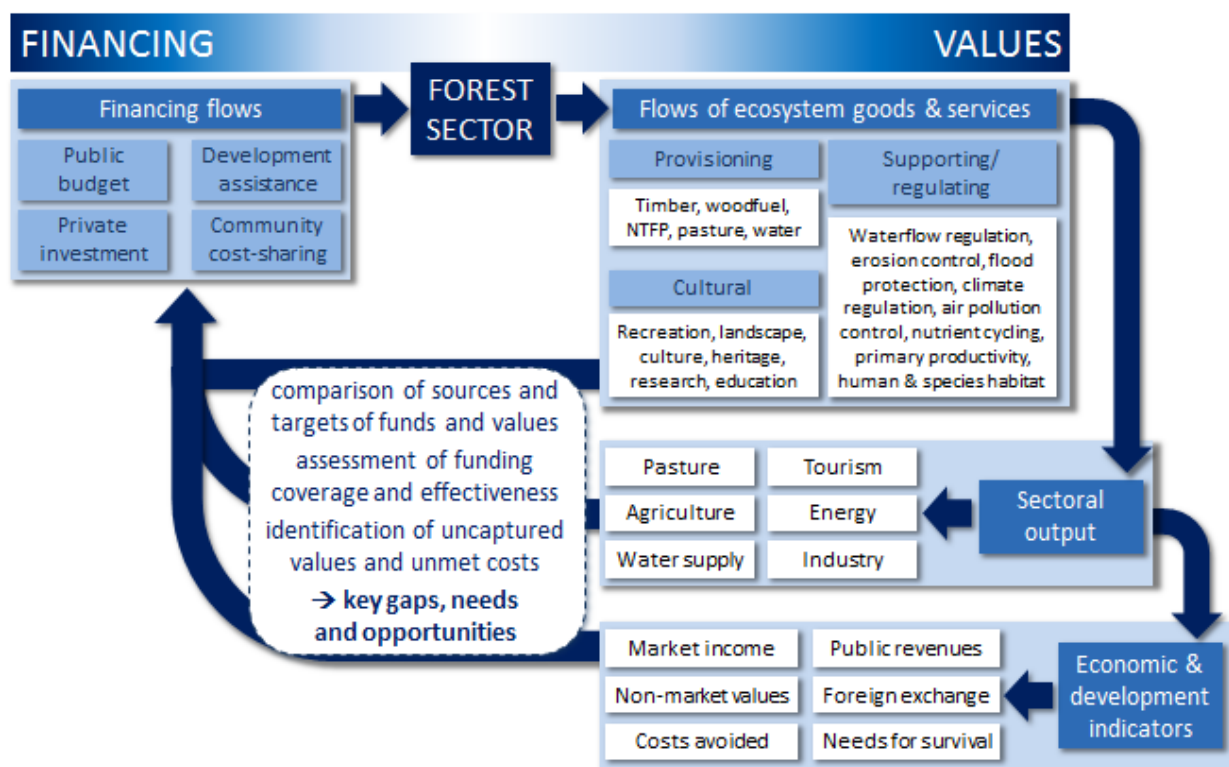
Conceptual framework and methodology

The study is based on a recognition that the contribution of the forest sector to the Mongolian economy far exceeds the raw materials, income and employment generated by wood products. Yet it is these direct, extractive values which have traditionally dominated official development statistics. They have also been the main focus of forest sector investments. Forest funding needs and opportunities however extend beyond “conventional” investments in commercial forest management and harvesting. In particular, funding to sustainable forest management (including REDD+) can leverage substantial economic and development gains.

Given the persistent under-valuation of the forest sector, it is hardly surprising that it has tended to be seen as a lower priority than other seemingly more “productive” sectors of the economy. Thus, in order to increase the budgetary and policy priority accorded to the forest sector, and especially to sustainable forest management (SFM), it is necessary to articulate and communicate clearly these broader values, funding needs and financing opportunities: in other words, to make the “development and economic case” for investment in the forest sector.

There are three components to the study: a rapid assessment of forest economic values, a review of funding to the forest sector, and an analysis which brings together this information in order to identify key funding gaps, need and opportunities (Figure 1).

Figure 1: study components and conceptual framework



The **rapid assessment of forest economic values** looks at the goods and services that forests generate, and their users. Benefits to the national economy, individuals, households and businesses are considered, and particular consideration is given to the way in which forest goods and services contribute towards output in other sectors. Some monetary estimates of forest values are made, including the ways in which they contribute towards Mongolia’s key economic and development indicators.

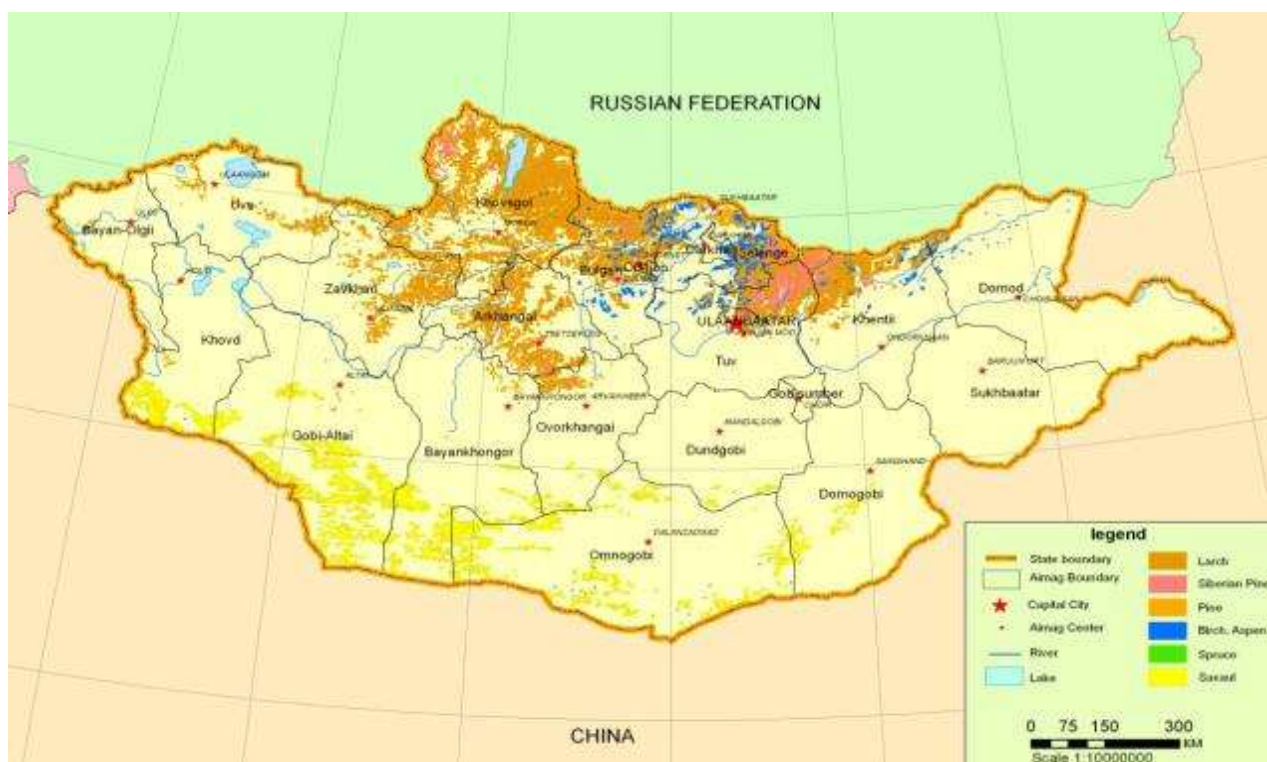
The **review of forest sector funding** looks at how forest-related expenditures and activities are funded. Both public budget allocations and external donor funding are considered, and some consideration is given to private investment flows and the local costs of community forest management (due to a lack of data, it is not possible at this time to fully quantify these). Funding is analysed over time, so as to point to trends in the amount, composition and targeting of financial resources.

The **analysis of values and financing** brings these two components together in order to compare the distribution of forest values and financing according to their sources, targets and beneficiaries. The intention is to assess forest sector funding coverage and effectiveness, and to identify where there may be uncaptured values or unmet costs. Leading on from this, the study **conclusions and recommendations** point towards key funding gaps, needs and opportunities for SFM in Mongolia.

Characterising the forest sector in Mongolia

This report understands forest in line with the definition provided in the Mongolian Law on Forestry 2007, as “the diversity of animals and plants, micro-organisms, and a complex of co-habiting natural and planted trees, bushes and shrubs that form a unique ecosystem of natural resources”. Land in Mongolia is classified into six land use categories, as laid out in the Law on Land 2002. Two of these categories may contain forest: “forest” (further sub-divided into forested areas, open/cleared areas and shrubland), and “state special land” (any forest located within special protected areas would be included under this category).

Map 1: forest areas and main species in Mongolia



From MEGD.

Forests in Mongolia can be divided into two broad types: the northern, mainly coniferous, forests of the forest-steppe, boreal forest and mountain zones; and the Saxaul shrublands of the southern desert and desert steppe. This report is concerned primarily with the northern boreal forest zone, which comprises around 85% of the national forest estate. Various estimates exist of the area under boreal forest, ranging

between 10-11 million ha in 2010 (Table 4, Table 5) to almost 14 million ha in 2012 (Table 6). Boreal forest is dominated by six main species (Table 7, **Error! Reference source not found.**): larch (*Larix sibirica*), birch (*Betula platyphylla*), Siberian pine (*Pinus sibirica*), Scots pine (*Pinus sylvestris*), aspen (*Populus tremula*) and spruce (*Picea obovata*).

Thirteen aimags² in Mongolia contain only boreal forest, and boreal forest accounts for more than two thirds of forest in one aimag³ (Table 6, Table 8). The valuation component³ of the study focuses on these fourteen aimags, which together contain 99.7% of all the boreal forest in Mongolia according to 2012 estimates. Within these aimags, 145 soums contain forest, comprising just under 14 million ha or 24% of their total area; just over half a million people or 154,000 households live in these soums (Table 9).

All forest resources in Mongolia are state property. The Ministry of Environment and Green Development (MEGD) has primary oversight for forest development and conservation, while aimag and soum administrations are responsible for forest management at the local level. The Law on Forestry 2007 however also allows for the MEGD and local government authorities to contract management and use rights to private forest enterprises (PFE) and community forest user groups (FUG). Approximately 2.9 million ha of boreal forest, or just under 30% of the total boreal forest area, is currently managed under contract by more than 100 PFE and 900 FUG (Table 10).

Only 7% or 7,300 km² of the national forest estate is designated as production forest, intended for commercial timber harvesting under permit (Table 11). A commercial harvest area of just under 100 km² was utilised in 2010 yielding 88,000 m³ of timber and 583,000 m³ of fuelwood (Table 12) – a figure which has been steadily increasing over time (Table 13). Around 90% of forests are either strictly protected (51,520 km²) or protected (50,160 km²), permitting only limited local use of firewood and NTFP and (in protected forests) thinning and cleaning operations. In 2010, almost 400,000 m³ of timber and fuelwood resources were harvested via thinning and cleaning operations carried out over an area of just under 120 km² (Table 14). Some of this protected forest is located in gazetted Special Protected Areas (SPA). In total, thirty eight of Mongolia's SPA contain some boreal forest, totalling an area of almost 30,000 km²; boreal forest comprises a significant⁴ component of sixteen SPA⁵ (Table 15).

The “forest sector” is conventionally defined only to include formal sector, mainly commercial, activities relating to the extraction, production, processing, sale and consumption of wood products and sometimes non-timber forest products (NTFP). This study takes a somewhat broader view, and looks at forest sector values and financing in relation to all the groups or sectors which depend or impact to a significant degree on forest goods and services. This is consistent with FAO recommendations that the forest sector “should be defined to include all economic activities that mostly depend on the production of goods and services from forests. This would include commercial activities that are dependent on the production of wood fibre (i.e. production of industrial roundwood, woodfuel and charcoal; sawnwood and wood based panels; pulp and paper; and wooden furniture). It would also include activities such as the commercial production and processing of non-wood forest products and the subsistence use of forest products. It could even include economic activities related to production of forest services” (Lebedys 2004).

² Arkhangai, Bayan-Olgii, Bulgan, Darkhan-Uul, Dornod, Khentii, Khovsgol, Orkhon, Selenge, Tov, Ulaanbaatar, Uvs and Zavkhan.

³ Ovorkhangai.

⁴ Defined as PAs containing forest areas of more than 250 km², or more than half of the total PA territory.

⁵ Khan Khentii SPA, Zed-Khantai-Buteel nuruu SPA, Khuvsugul lake NP, Tengis-Shishkhed NP, Khangain nuruu NP, Numrug SPA, Tarvagatain nuruu NP, Gorkhi-Terelj N, Khan Khukhii NP, Onon-Balj A;B NP, Khan Jargalant uul NR, Tujiin nars NP, Khoridol Saridag SPA, Dayan deerkjiin agui NM, Bogdkhaan mountain SPA, Namnan uul NR

The study intends to “provide policy options and recommendations for increasing forest sector financing through the public sector to sustainable forest management in Mongolia”. Sustainable forest management (SFM) has been variously defined by different organisations at different times. This report takes the United Nations Forum on Forests (UNFF) definition of SFM as a concept or approach which “aims to maintain the economic, social and environmental value of all types of forests, for the benefit of present and future generations. SFM is characterized by seven thematic elements, including: (i) extent of forest resources; (ii) forest biological diversity; (iii) forest health and vitality; (iv) productive functions of forest resources; (v) protective functions of forest resources; (vi) socio-economic functions; and (vii) legal, policy and institutional framework⁶”.

Data sources, assumptions and uncertainties

There remains a lack of accurate data on forest sector values and financing in Mongolia. This has made it difficult to carry out the quantitative and monetary analyses that the current study demands. The figures contained in this report should therefore be understood as rough estimates, based on the information available at the time of the study. They should be treated with some caution.

Calculations are constrained by the quality and coverage of existing data. Much of the available information is outdated, and different information sources are often inconsistent with each other. In particular, data on forest sector funding, production, consumption and values are often associated with varying estimates of boreal forest areas or with different years. Some statistics and records were found to contain obvious errors (for example gaps, incorrectly added totals, no specification of the unit of measurement, or confusion between thousands, millions and billions of units). For these reasons, different data sources have been carefully cross-checked during the course of the study, in order to find the most reliable estimates. Where possible, the most recent Government of Mongolia figures are used. In several cases, data have been cleaned up where apparent errors or inconsistencies appear.

There also remain many uncertainties and information gaps about sustainable forest use. In particular, there is considerable debate as to whether the current annual allowable cut reflects an economically and ecologically sustainable harvest level. As The figures presented in the report refer primarily to sustainable forest land and resource management and utilisation, even when this includes unlicensed or informal-sector use. Where harvest or offtake is known to be unsustainable (for example to supply the global wildlife trade), it is excluded from calculations.

As available data refer to a wide range of different years and currency units, prices have been converted to 2013 MNT and US\$, using a GDP deflator⁷ to allow for comparison and collation. The spelling of Mongolian place names follows that used in the NSO Statistical Yearbook.

⁶ ECOSOC “General Assembly Resolution 62/98” (2008), cited in CPF 2012.

⁷ Using data from the IMF World Economic Outlook and National Statistical Office of Mongolia.

VALUES: review of forest sector-economic linkages

This chapter assesses the value of forest sector goods and services to the Mongolian economy, and describes their contribution to key growth and development indicators. Its main findings are:

- At current harvesting levels, timber may have an annual sale value of almost MNT 94 billion (US\$ 68 million) and fuelwood MNT 104 billion (US\$ 75 million), generating MNT 43 billion (US\$ 31million) and MNT 23 billion (US\$ 17 million) in operating profits to producers. More than half of this value comes from unlicensed removals.
- Non-timber forest product collection has a total value of almost MNT 16.5 billion (US\$ 12.18 million) a year, spread over around half of the rural population in soums with boreal forest. More than 90% of this value comes from unlicensed removals, and three quarters is accounted for by home-consumed products which never enter the market.
- Forests provide an important seasonal source of pasture for livestock, to a value of more than MNT 34.5 billion (US\$ 24.70 million) contribution to herders' gross margins. This comprises up to 5% of the value of livestock production in soums with boreal forests.
- Hunting under permit in boreal forest areas generates products with an annual market value of between MNT 91 million (US\$ 65,000) if sold locally and MNT 2.7 billion (US\$1.9 million) if hunted for sport.
- Forest-based leisure tourism directly generates more than MNT 22.7 billion (US\$ 16.34 million) in visitor spending and sales, supports up to 6,000 jobs and wage earnings of MNT 18.31 billion (US\$ 13.17 million), and makes a direct contribution to GDP of MNT 55.26 billion (US\$ 39.73 million). Its multiplier effects across the economy are substantial: the total contribution to GDP may be in excess of MNT 144 billion (US\$ 103.75 million), including MNT 48.83 billion (US\$35.11 million) in wage earnings, MNT 93.86 billion (US\$ 67.48 million) in sales, MNT 28.07 billion (US\$ 20.18 million) in value-added and MNT 17.07 billion (US\$ 12.27 million) in capital formation.
- Boreal forests may sequester carbon worth some MNT 77.29 billion (US\$ 55.57 million) a year. Although unquantified, they also have a storage value, particularly in the context of REDD+.
- Forest watershed protection services in the Upper Tuul basin alone are worth MNT 27.2 billion (US\$ 19.6 million) a year to water users in Ulaanbaatar.
- The net value⁸ to users of the forest goods and services valued in this study is some MNT 395 billion (US\$284 million), equivalent to an average of MNT 40,000/year per hectare of the boreal forest estate (US\$ 28).
- The government earns more than MNT 36 billion (US\$26.3 million) in revenues from forest product harvesting and utilisation activities, including tourism and water but excluding the taxes paid by other forest-based enterprises. This is equivalent to an average of MNT 3,600/year per hectare of the boreal forest estate (US\$ 3).
- The net value-added to rural households from fuelwood use, NTFP collection and forest grazing is equivalent to more than 12.5% of per recorded capita GDP.
- The total annual direct value-added from the forest sector is equivalent to a figure that is around 3.1% the value of GDP, while public revenues are equivalent to around 1.4% of all tax revenues.

⁸ Input and production costs have been deducted, including permit fees and taxes. Rural labour utilised for grazing and NTFP collection has not however been costed.

Wood products income and output

While the commercial harvesting potential of boreal forest was estimated by MEGD at just over 0.8 million m³ in 2010 (Table 12), actual harvest volumes were somewhat less than this at 0.68 million m³ – although have been growing steadily over the last decade (Table 13). The wood generated from thinning and cleaning operations was equivalent to just under 0.4 million m³ or more than half as much again as the harvest from commercial utilisation activities (Table 14).

Total licensed forest harvest volumes from boreal forests reached 0.88 million m³ in 2011 and 0.83 million m³ in 2012, of which 15% and 28% respectively was accounted for by timber removals and the rest fuelwood (Table 16, Table 17). Although no figures are available for the wood provided through cleaning and thinning operations in 2011 or 2012, we assume a volume of removals similar to that recorded in 2010: approximately 36,000 m³ of timber and 360,000 m³ of fuelwood. This gives us an estimated total wood removal from commercial harvesting, thinning and cleaning of 271,100 m³ of timber and 956,020 m³ of fuelwood.

This figure represents licensed wood utilisation. Much of the timber and fuelwood that is harvested each year in Mongolia however takes place on an informal basis, outside the permit system. Unsurprisingly, there are few reliable estimates of the scale of unlicensed wood removal. Just under 5,000 m³ of illegally-felled timber was recorded by the MEGD as having been confiscated in boreal forest aimags in 2010 (Table 18). This likely represents only a very small proportion of the actual volume of wood removed. Other sources put the figure far higher than this, claiming that between a quarter and 80% of harvests are illegal (Crisp *et al* 2004, WWF 2002).

We base our estimates of total timber removals on national sawnwood consumption figures for 2004 of between 100,000 and 400,000 m³ (Crisp *et al* 2004), conservatively assumed to have increased in line with population growth⁹. This gives a 2013 figure of just over 0.4 million m³ of processed balks, poles, sleepers and planks, equivalent to around 0.74 million m³ of raw logs. It is assumed that all commercial timber is extracted from boreal forests. No roundlogs or sawn timber are legally exported from Mongolia¹⁰ or are recorded as imports, and there seems to be no indications of an illegal cross-border timber trade (Crisp *et al* 2004). It can therefore be assumed that all timber harvested from boreal forests is for use within Mongolia, and that all domestically-consumed timber is sourced within the country.

Our estimate of woodfuel removals is based on actual demand from aimags with significant boreal forest cover¹¹. Calculations take account of demand from rural households as well as ger dwellers in Ulaanbaatar, differentiating consumption volumes between households which are wholly dependent on woodfuel and those who also use livestock dung (Foppes 2012). This yields a figure of just over 2.3 million m³ of fuelwood consumed in 2013, equivalent to some 3 million m³ of raw wood removals.

Putting these figures together suggests that around 3.7 million m³ of raw wood a year may currently be removed from boreal forests, of which timber accounts for 0.74 million m³ or 20% of the total, and fuelwood 2.92 million m³ or 80% (Table 1). Around a third of the timber and fuelwood consumed is sourced through licensed use, meaning that there is an unlicensed harvest of around 0.47 million m³ of timber and 1.96

⁹ This is considered an underestimate, as it is based on a constant per capita demand for timber. Due to the rapid growth in industry and urbanization over the past decade, the rise in timber demand is likely to have in reality outstripped the growth in population.

¹⁰ A timber export ban has been in place since 1999. Although records show that over the last five years there have been occasional exports of timber and very small quantities of sawnwood (NSO 2011), it must be assumed that these are re-exports.

¹¹ It is assumed that households in the south of the country source woodfuel from Saxaul and shrub woodlands.

million m³ of fuelwood. Total removals, both licensed and unlicensed, are worth some MNT 66 billion (US\$ 48 million) in earnings to producers and have a retail value of almost MNT 200 billion (US\$ 142 million). It should be emphasised that a high proportion of wood extraction – more than half – is unlicensed.

Table 1: timber and fuelwood values

	Timber	Fuelwood	Total
Licensed removals from commercial harvesting (m ³ '000 raw wood equivalent)	235.10	596.01	831.11
Licensed removals from thinning and cleaning production (m ³ '000 roundlog equivalent)	36.00	360.00	396.00
Unlicensed removals (m ³ '000 raw wood equivalent)	469.32	1,964.39	2,433.71
Total removals (m ³ '000 raw wood equivalent)	740.42	2,920.40	3,660.82
Operating margins to producers (MNT million)	42,719	23,358	66,077.52
Retail value (MNT million)	93,470	103,628	197,097.38

As already mentioned, the sustainability of current harvests is unclear. There seems little doubt that some sites and species are being heavily over-utilised as a result of unlicensed wood removals. However, the sustainable annual harvest volume for Mongolia's forest has not yet been unequivocally determined (Ykhanbai 2009a). Several authors have noted that licensed wood removals are low as compared to the recommended annual allowable cut and production levels of between 2-3 million m³ in the 1970s, 1980s and 1990s (FAO 2006, WWF 2002). The current area designated as production forest is thought by some authors to be unnecessarily small. The World Bank's 2004 Forestry Sector Review for example implies that the area allocated for commercial utilisation does not reflect a scientific assessment of the sustainable annual allowable cut, and uses a rough estimation process to suggest that this could be up to 1.4 million m³ if 25% of the current protected zone were released for utilisation, and more if further areas were opened up for sustainable harvesting (Crisp *et al* 2004).

Available data do not permit a detailed breakdown of these value figures between different participants in the timber and fuelwood industry (contributions to public revenues are analysed later in this chapter). It is however known that almost 700,000 ha of boreal forest are contracted out to more than 100 PFE, and around 2.2 million ha is managed by around 900 FUG (Table 10).

There are no data available on the volume or value of forest products used by FUG. Although FUG can harvest and sell forest resources to generate income (the potential for livelihood improvement or future income is cited as an important motivation for FUG members; Fisher *et al* 2012), actual harvests and earnings currently remain very low (Foppes 2012). We can therefore assume that very little of the market value of wood removals is accruing to FUG (although a significant portion of the consumption value may be). The bulk of commercial harvest values are likely being captured by PFEs and other participants in the timber and fuelwood marketing chain.

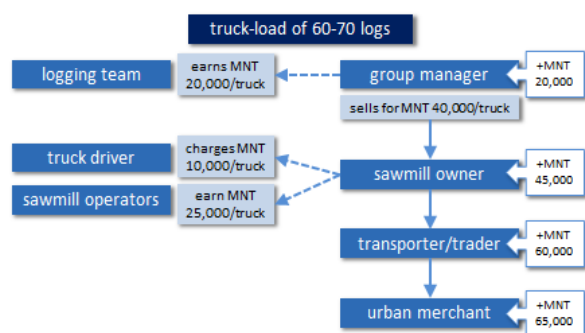
In addition to the one hundred or more PFEs licensed to harvest timber in production forests, at least as many businesses are registered in boreal forest aimags¹² which deal with the processing, marketing, transport and sale of timber and non-timber forest products. Most of these are small and medium-sized enterprises (SME), employing fewer than ten workers and with an average annual turnover of MNT 20 million (US\$ 15,000) or less. The total income generated by registered forest enterprises in boreal forest aimags is recorded as being just over MNT 4 billion in 2012, with a combined operating margin of some MNT

¹² Excluding Ulaanbaatar.

614 million. This represents only a small proportion of the total value of the wood harvest in terms of producer operating margins (Table 1). Other unregistered forest businesses also operate, without licenses.

Almost 1,000 wood-based industries are thought to exist at the national level, including both timber harvesting and processing/marketing enterprises. Although a detailed breakdown of the composition of forest industries was not available to the study, records from 2004 indicate that of the 678 mills and manufacturers operating at that time, 175 were producers of construction materials and components, 207 were producers of other wooden and woven products, 48 were producers of wooden panels, 36 were producers of wooden crates and containers, 123 were producers of timber and 89 were logging companies (Ykhanbai 2009a). Comparing these figures with the estimates provided above indicates that only a tiny proportion of forest values is being captured locally. Timber and fuelwood earnings are spread over a wide range of market participants, and a broad chain of value-addition (Figure 2).

Figure 2: value-chain for small-scale informal logging



Adapted from information provided in Ykhanbai 2009a

Utilisation of non-timber forest products by local communities

MEGD records show that, in 2010, just over 300 tonnes of spruce and pine nuts, wild berries and other NTFP were collected under permit in boreal forest aimags (Table 19). At current market prices these may have a value of between MNT 1.5-2.7 billion (US\$ 1-2 million), depending on whether they are home-consumed or sold. It should be noted that this figure is substantially higher than that cited in a 2004 FAO report, which estimates that fruits, nuts, essential oil and resins with a market value of about US\$360,000 or MNT 0.5 billion at today's prices were harvested from forests and supplied to domestic markets (Ykhanbai 2009a).

As is the case for wood products, a large proportion of NTFP harvesting takes place outside the permit system. It is known that herder communities collect a wide range of plant products. Recent work among FUG has found that members are harvesting fruits, berries, mushrooms, wild vegetables, pine nuts, preserved berries and medicinal herbs for home consumption and sale on local markets (FAO 2006, Foppes 2012). Detailed surveys of the use and value of NTFP for rural households have been carried out in Bayan-Ulgii (Lkhagvadorj *et al* 2013), Khentii, Selenge and Tuv aimags (Emerton *et al* 2009). Extrapolating these findings to the total rural population living in soums with boreal forests suggests that almost 65,000 households may be regularly collecting up to 4,250 tonnes of fruits, berries, wild vegetables, nuts and medicinal plants, to a total value of almost MNT 16.5 billion (US\$ 12.18 million) a year.

Just over MNT 12 billion (US\$ 9.13 million) or 75% of this value is accounted for by home-consumed products, while MNT 4 billion (US\$ 3.05 million) is earned as cash income from sales in local markets or to middlemen. Typically, much of the cash earned from NTFP sales is captured by richer households: while the

poor function primarily as labourers, better-endowed households are able to process products, and through value addition and transport to markets can command much higher prices (FAO 2006, Fisher *et al* 2012).

Forest pasture

Another important economic value of boreal forests for surrounding communities is as a source of pasture for grazing and hay-making. Forest grazing appears to have been intensifying over recent years, as herders have become more sedentary and have reduced their seasonal migration patterns (Lkhagvadorj *et al* 2013).

Based on data provided by soum administrations on livestock ownership and production and on the incidence and frequency of forest grazing, it is possible to come up with an approximate figure for the value of forest pasture. Various estimates exist of forest carrying capacity, actual and optimal stocking rates. Actual rates are recorded as something around 1.1 SEU/ha in forest-steppe zones and 0.62 SEU/ha in high mountain meadows in and above the forest belt (Jamsranjav 2009), somewhat over the suggested carrying capacity of 0.63 SEU/ha and 0.71/ha respectively (Jigmed 2006). Work carried out in four northern boreal forest aimags (Bulgan, Tov, Uvs and Zavhan) cites an actual stocking rate of an average of 0.85 SEU¹³/ha as compared to a biologically optimal stocking rate of 0.70 SEU/ha and an economically optimal stocking rate of 0.66 SEU/ha (Hezik 2002).

In line with a concern to ensure that value estimates reflect sustainable values, we apply an average stocking rate of 0.7 SEU/ha for the 10% of forest area (including glades, meadows and logged areas) that are assumed to make a contribution towards local herders' annual hay and pasture needs¹⁴. This gives a total value for 2013 of MNT 34.5 billion (US\$ 24.70 million) for the contribution of forest pasture to herders' gross margins. Boreal forest pasture provides partial support for about 12.5% of herds, and accounts for around 5% of the total annual value of livestock production in soums with boreal forest. It can be noted that this figure (MNT 6,250 or US\$ 4.50/ha/year) is similar to the estimate of forest grazing value presented in Foppes 2012.

Hunting and wildlife trade

It is thought that more than a third of Mongolians use wildlife in some form, either commercially or for personal consumption (Wingard and Zahler 2006). Although most hunting focuses on grassland and steppe species, some birds and animals found in boreal forests are hunted. Much of this is unlicensed, in excess of quotas or involves listed species, and so there are few reliable or up-to-date figures on the level of hunting or the scale of the – largely illegal – wildlife trade. Surveys however indicate that the value of the wildlife trade is substantial: it is thought to be worth more than US\$100 million a year (Wingard and Zahler 2006), supplying meat, skins, fur, medicinal products, live animals and animal parts both domestically and internationally (Kirkpatrick 2005, TRAFFIC 2003, Zahler *et al* 2004).

As much of this utilisation and trade is illegal, it is not considered sustainable, and therefore not included in calculations of the value of the forest sector. Only the income related to licensed hunting is included. The national hunting quota for 2010 (Table 30) includes at least five bird and animal species which depend at least partly on boreal forest for their habitat¹⁵. Applying average domestic trade prices and sport hunting values (from Wingard and Zahler 2006) to this offtake suggests that licensed forest hunting may have an

¹³ Sheep Equivalent Unit, commonly used to express livestock numbers in Mongolia.

¹⁴ Further research is required to determine the actual area of forest that is used for pasture, and the sustainability of this use.

¹⁵ Including roebuck, wild pig, western capercaillie, black and hazel grouse.

annual market value of between MNT 91 million (US\$ 65,000) if sold locally and MNT 2.7 billion (US\$1.93 million) if hunted for sport.

We discuss the value of forest tourism in the next section. In relation to hunting, it should however be noted that recreational or trophy hunting comprises a significant segment of Mongolia's tourism market. Although it is not possible to quantify this value as distinct from that of forest-based leisure tourism more generally, hunting tourism generates substantial values. A wide range of domestic and international hunting outfitters offer trips in Mongolia, with several advertising "forest specials" targeting species such as maral stag, roe deer, bear, lynx, wild boar and wolf. This tends to be high-value, high-end tourism: the in-country¹⁶ price of a two week hunting trip averages US\$5,000 per person (and can be priced as high as US\$50,000 if including major trophy animals), plus additional charges of US\$1,000 or more for permits, trophy fees, certificates and ammunition.

Tourism and recreation

Mongolia has become a popular global tourism destination, and nature-based recreation accounts for a growing share of this market. It is known that, for international tourists, natural areas (including forested landscapes) come high in the list of the most popular tourist attractions: for example, Gorkhi Terelj NP is the third most visited attraction, followed by Hövsgöl Lake (Yu and Munhtuya 2006). The Ministry of Roads, Transport and Tourism (MRTT) estimate that 44% of Mongolia's current tourism products are based on nature (MRTT 2013).

No specific data on forest-related tourism¹⁷ were available to the study. Very rough estimates of the value of forests for recreation can however be extrapolated from total leisure tourism figures. Around 0.5 million international arrivals were recorded in 2011, of which 90,000 are stated to be leisure tourists¹⁸; average leisure tourist spending within Mongolia per is estimated to be US\$ 581 per trip¹⁹ (UNCTAD 2012). The length of international leisure tourists' holidays in Mongolia averages 16 days (Yu and Munhtuya 2006), and it is assumed that just under a third, or 5 days, of a typical visit is spent in forested landscapes. Based on the share of leisure tourist days spent in forest areas, this translates into a possible annual value of MNT 22.73 billion (US\$ 16.3 million) in direct spending on visits to forested areas. Forest-based leisure tourism may directly support up to 6,000 jobs and generate wage earnings of MNT 18.31 billion (US\$ 13.17 million), and make a direct contribution to GDP of MNT 55.26 billion or US\$ 39.73 million (extrapolated from sector-wide estimates in UNCTAD 2012, WTTC 2012).

Both the United Nations Conference on Trade and Development (UNCTAD) and the World Travel & Tourism Council (WTTC) have, with MRTT, constructed tourism satellite accounts for Mongolia. These consider the wider indirect, induced and multiplier effects of the sector on the economy. Based on the contribution of forest recreation to all leisure tourism, the total contribution of forest-related leisure tourism to GDP may be in excess of MNT 144 billion or US\$ 103.75 million (extrapolated from sector-wide estimates in WTTC 2012). This reflects the economic activity generated by industries such as hotels, travel agents, airlines and other passenger transportation services, as well as the restaurant and leisure industries directly supported by tourists. If the wider effects from investment, the supply chain and induced income impacts are included,

¹⁶ Excluding air fares and equipment costs incurred outside Mongolia.

¹⁷ Such as time spent in different locations, or recorded entries and revenues from protected areas.

¹⁸ Over 40% of gross visitor number consists of border traders, construction workers, etc. using tourist visas to gain entry for local employment, and more than half are business travellers.

¹⁹ Comprising US\$111 on hotels, US\$30 on restaurants, US\$73 on transport, US\$119 on tourism activities and US\$197 other spending.

forest-related leisure tourism may in total generate up to MNT 48.83 billion (US\$35.11 million) in wage earnings, MNT 93.86 billion (US\$ 67.48 million) in sales, MNT 28.07 billion (US\$ 20.18 million) in value-added and MNT 17.07 billion (US\$ 12.27 million) in capital formation (extrapolated from sector-wide estimates in UNCTAD 2012).

Public revenues

Forest sector activities contribute directly to a number of public revenue streams. These include royalties, fees and charges earned from licensed timber, fuelwood and NTFP harvesting, hunting and protected area entry. According to MEGD and NSO statistics, around MNT 1.5 billion (US\$ 1.05 million) was earned from timber and fuelwood harvesting revenues in boreal forest aimags in 2010 (Table 12), rising to MNT 2.2 billion (US\$ 1.6 million) in 2011 and MNT 2.6 billion (US\$ 1.9 million) in 2012 (Table 16, Table 17). Almost MNT 3.7 billion (US\$ 2.7 million) was generated from hunting fees²⁰ (Table 21), of which MNT 0.42 billion (US\$0.3 million) can be ascribed to forest-dwelling species. The state also earns revenues from the fines and penalties levied on illegal forest utilisation. In 2010, more than MNT 455 million (US\$ 32,000) was collected in boreal forest areas (Table 18). As is discussed in more detail later in the report, these revenues are not reinvested directly in the forest sector. Although a portion is earmarked for retention in the Nature Protection Fund, this is used to fund a variety of environmental and nature protection activities.

The government also earns revenues from the other sectors that depend on forest goods and services for raw materials or secondary inputs. It is not possible to quantify the total value of other sectoral revenues that depend on forest goods and services. Two indicative examples can however be given. In 2003, just under 700 business entities operating in timber production and timber products are estimated to have paid MNT 1.1 billion (US\$ 0.80 million) in taxes (Report of the National Taxation Authority cited in World Bank 2007). Although the output from the tourism sector flowing as income to the government is thought to be fairly small²¹ at just 1.7% (UNCTAD 2012), the fiscal revenues from forest-related leisure tourism are estimated to be around MNT 1.59 billion (US\$1.15 million).

It is worth noting that the illegal timber trade has implications for public revenues. Based on the figures presented earlier in this report, unlicensed wood removals from boreal forests cost the Government of Mongolia some MNT 6.68 billion (US\$4.80 million) in foregone revenues a year. This is more than twice as much as the revenues that are currently collected from licensed timber harvesting, or a sum equivalent to more than 1% of all local government tax revenues.

The economic value of forest ecosystem services

Boreal forests provide a wide range of ecosystem services to Mongolia's population and economy. In addition to the provisioning services described in the sections above (timber, fuelwood, NTFP, hunting, grazing and recreation), forests generate supporting and regulating services such as carbon sequestration, soil erosion control, watershed protection, and habitat for rare and endangered species. A wide array of cultural, spiritual and existence values are also associated with forest sites and landscapes.

There are as yet no data on the value of forest supporting, regulating and cultural services. Some efforts are however currently being made to develop and apply ecosystem valuation methods in the country. The

²⁰ These revenues are not included in the sector total presented at the end of the chapter. This is because the bulk of hunting fees are generated high-value steppe and grassland trophy animals, not from forest-dwelling game.

²¹ Among other reasons, this low take is due to the exemption of tour operators from VAT.

concept of “economic and ecological valuation” is now embedded in Mongolian law and practice. Its main use and application is envisaged in relation to calculating the levels of compensation that must be paid for ecological damage (for example, the Comprehensive National Development Strategy of Mongolia includes reference to making “ecological and economic assessment of deposits and improve standards for evaluating, imposing and making payable penalties for ecological damage, compensation and fees”). The Law on Forestry 2007 defines “forest ecological-economic valuation” as the monetary expression of ecological and economic benefits derived from the volume, quality and utilization of forest resources. A number of supporting rules and guidelines on forest ecological-economic valuation were approved in 2009 via Decree 394. However, as yet there has been little on-the-ground application of forest ecological-economic valuation in Mongolia, and there is as yet virtually no information available on the economic value of forest ecosystem services. Some rough estimates may however be made of key forest ecosystem service values based on figures calculated for similar sites and conditions elsewhere.

Mongolia’s boreal forests constitute an important carbon sink. The total stock of forest carbon was estimated at 583 million tonnes in 2010 (FAO 2010, Table 29). This figure however represents a significant underestimate, as it does not include the pools of soil carbon, litter or deadwood which in boreal forests are estimated to contain approximately 60% of the forest carbon (MEGD 2013). Globally, the net carbon uptake of boreal forests is estimated to range between 0.34-0.56 tC/ha/year²², including both above-ground and below-ground storage. We apply the average of these estimates, 0.42 tC/ha/year, to the to the 10.898 million hectares of boreal forested areas in Mongolia,

Although it is difficult to find an accurate figure for the economic value of carbon sequestration, most studies use the market price of forest carbon as a proxy for people’s willingness-to-pay. Applying the 2011 average voluntary carbon market price for forest management projects of US\$12/tCO₂e (Peters-Stanley and Hamilton 2012) suggests a total annual value of MNT 77.29 billion (US\$ 55.57 million) for forest carbon sequestration services. It is worth noting that this figure (equivalent to US\$5.10/ha/year) is in a similar range to that (US\$7.87²³) calculated for Canada’s boreal forests using the Boreal Ecosystem Wealth Accounting System tool (Anielski and Wilson 2005). No up-to-date figures are available on the area under afforestation and reforestation activities, although an estimate of just over 7,000 ha is given for 2005 (FAO 2010), of which around 300 hectares is accounted for by Green Wall sites in southern Saxaul shrub forest (Ykhanbai 2009a). We assume that afforestation and reforestation activities are continuing today at a similar level. At an average voluntary carbon market price for afforestation/reforestation projects of US\$9/tCO₂e (Peters-Stanley and Hamilton 2012), this will equate to a value of some MNT 48 million MNT (US\$ 35,000) once this forest is mature (as no data were available on the rates of carbon uptake by growing boreal forest, or on the past history of afforestation and reforestation activities, it is not possible to include this value in our calculations).

Although Mongolia’s forests also constitute a carbon source. Unfortunately, available data did not permit the carbon storage value of forests to be quantified. It was also not possible to estimate emissions from deforestation and forest degradation; emissions from degradation, in particular, are likely to be significant.

Many of Mongolia’s major river systems rise in the north of the country (Map 2), and forests provide an important source of watershed catchment protection for both surface water and groundwater supplies. Forest cover helps to regulate both waterflow and water quality. A study carried out in 2008 by the World

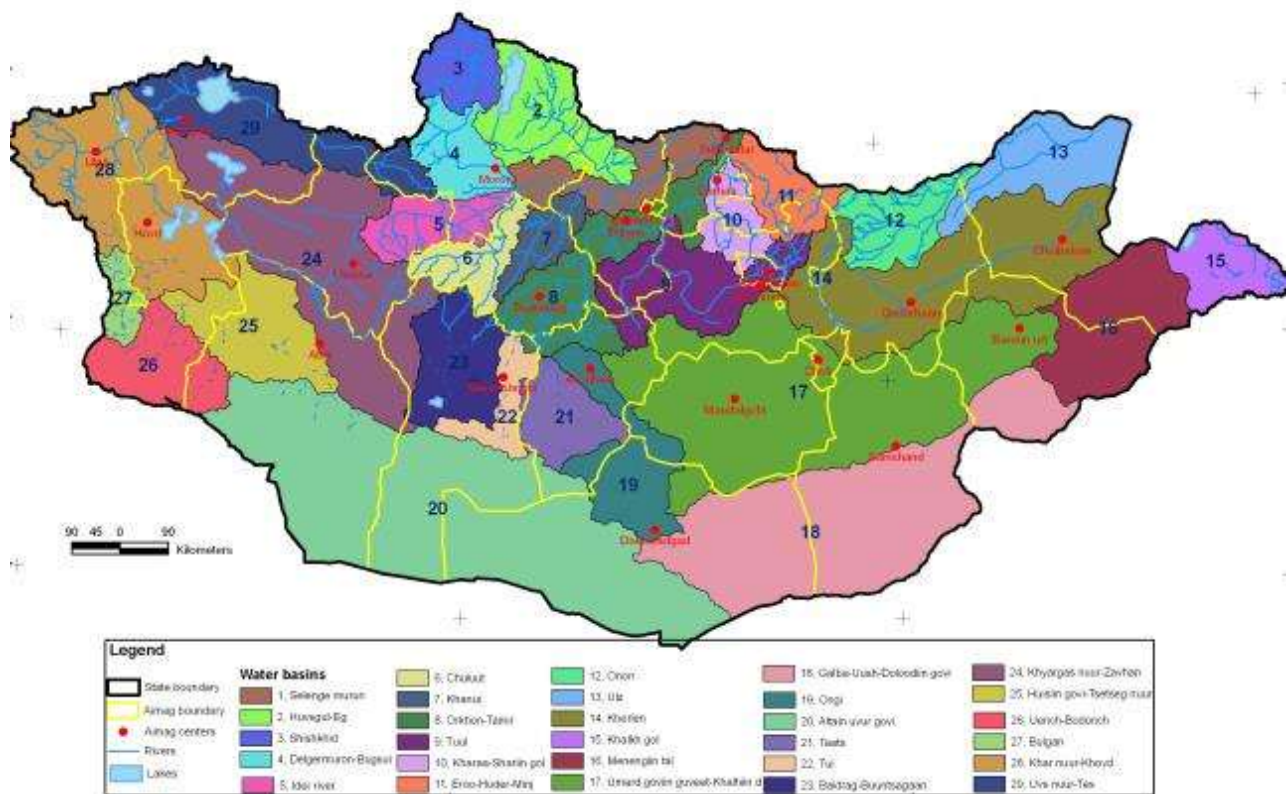
²² From Griffiths and Jarvis 2004, Kasischke and Stocks 2000, Pan *et al* 2011, Shivdenko & Apps 2006.

²³ Updated to 2013 US\$ equivalent price.

Bank (Emerton *et al* 2009) looked at the value of the forested Upper Tuul catchment for downstream groundwater supplies to Ulaanbaatar. This found that sustainable land management and forest conservation in the Tuul River's upper watershed contributes additional annual waterflow services worth MNT 58.8 billion (US\$ 42.3 million) at today's prices to urban water users (including MNT 31.5 billion (US\$ 27.7 million) in government revenues), over and above the water values yielded under continuing ecosystem degradation – a value equivalent to MNT 48,500/ha (or US\$35) of upper watershed forest.

Although these figures cannot be extrapolated to other forested watersheds of Mongolia, because both hydrological conditions and levels/values of downstream water use vary considerably, it should be noted that a number of other river basins depend on forested upper catchments, including the Kherlen, Khuvsgul-Ed, Onon, Orkhon-Tamir, Selengemurun and Shishkid. It should be emphasised that the estimates of forest watershed protection values that are included in this study only look at the Upper Tuul ecosystem. It therefore only quantifies a small proportion of the total value of forest watershed protection. Many other forested watersheds also generate extremely high values. The total domestic, municipal, industrial and agricultural demand for water in Mongolia's forested basins, including the Tuul, is currently estimated to be more than 175 million m³ a year (MEGD 2012b).

Map 2: river basins in Mongolia



From MEGD 2012a.

The forest sector in macroeconomic and development indicators

Official statistics suggest that the forest sector makes only a small contribution to GDP and associated macroeconomic indicators. The recorded share of the forest sector in GDP was estimated to be just 0.25% in 2009 (Ykhanbai 2009a). According to end-of-year statistics for 2012 (NSO 2013), the share of wood and wood products in gross industrial output was just MNT 15.67 billion (US\$ 11.26 million) or 0.8% of total

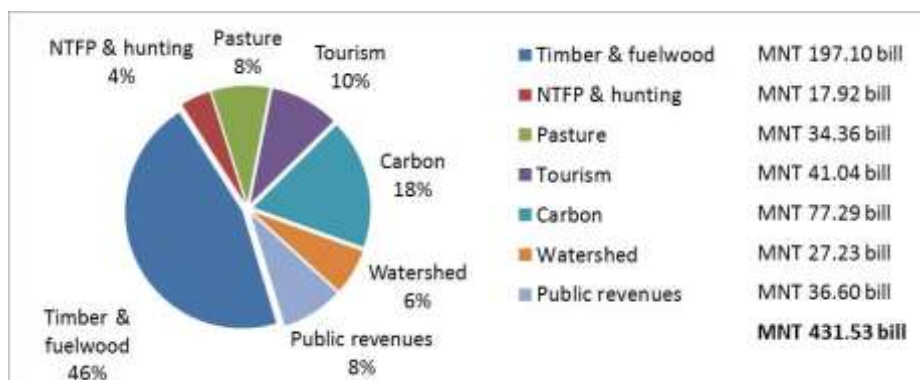
manufacturing output (Table 24). Something over 1,200 people were recorded as being employed in wood and wood products manufacturing, comprising only 4.5% of all employment in manufacturing (Table 28). Recorded forestry sector timber, fuelwood and hunting revenues contributed just 0.2% of central government tax revenues, and 0.8% of local government tax revenues in 2010 (Table 21, Table 22, Table 23).

The apparently low importance of forestry is partly due to the dominance of the livestock and mining sectors in Mongolia’s national economy. However it also results from the way in which statistics have in the past been calculated and compiled. Forest sector GDP is presented as part of the agriculture sector (including livestock, crops, fisheries, hunting), not as a separate item, meaning that it is hard to discern or separate out. Perhaps most importantly, economic and development statistics include only formal, commercial activities (i.e. those associated with licensed wood production and registered forest industries). As we have seen in this chapter, much of the value added by the forest sector takes place outside formal markets, and is not licensed.

This means that official statistics undoubtedly underestimate massively the actual value of the forest sector to the national and local economy. A 2007 World Bank study for example shows that natural capital (including forest, land and subsoil assets) constitutes almost 60% of Mongolia’s total wealth – more than twice as much as produced capital (World Bank 2007). Forests and protected areas comprise almost a third of this value, equivalent to almost US\$ 2,000 for every Mongolian at 2013 prices. A forest resources accounting study found the costs of forest degradation to be some MNT 521 billion in the year 2006, equivalent to almost a fifth of recorded GNP (Ykhanbai 2009b). The Ministry of Economic Development (MED) is currently working with the NSO and MEGD to start to routinely collect more detailed information on environmental costs and benefits, including their contribution to GDP, and to incorporate them into economic and development indicators for Mongolia. It can be anticipated that much better data on the role of the forest sector in the economy will be available in the future.

This chapter has quantified some of the key values associated with forest sector goods and services in Mongolia. It shows that the net value-added from boreal forests may be in the range of MNT 431.5 billion (US\$ 310 million) a year, equivalent to an average value of MNT 42,900 (US\$ 31) per hectare of the boreal forest estate (Figure 3). Around 8% of this value accrues as public revenues, while the remainder is received from key users of forest goods and services. As this represents only a partial valuation, using very rough estimates that are based on conservative assumptions, these figures represent only a small share of the total economic value of forest goods and services to the Mongolian economy.

Figure 3: partial estimate of the economic value of forest goods and services (2013 MNT billion)



Some of the calculations that are presented in the paragraphs above can be compared with official economic statistics (from NSO 2013) in order to underline the importance of the forest sector in economic terms – and to highlight the substantial values that go unrecorded when these figures are omitted from decision-making (Table 2).

The market value of wood products, NTFP, hunting and forest-based tourism is more than fifteen times as high as forest sector recorded sales values. For users, the largely unrecorded values accruing from forest goods and services are substantial when compared to official GDP: for example, the net value-added to rural households from fuelwood use, NTFP collection and forest grazing is equivalent to more than 12.5% of per recorded capita GDP. In total, the annual direct value-added from the forest sector is equivalent to a figure that is worth 3.1% the recorded value of GDP, while the public revenues directly generated are equivalent to around 1.4% of all tax revenues. Nation-wide forest carbon sequestration and watershed catchment protection services for Ulaanbaatar generate values that are, at more MNT 100 billion a year, almost seven times greater than the gross industrial output recorded for the wood manufacturing sector.

Table 2: summary of forest economic values and development indicators

Forest good/service	Volume/quantity indicators	Direct and indirect monetary indicators	Direct and indirect development indicators
Licensed timber	271 million m ³ harvested	MNT 40,668 million retail value MNT 15,641 million business profits MNT 1,417 million public revenues	Supplies part or all of the fuelwood needs of 390,000 households – average per household value of MNT 265,000/year Provides income to 900 community FUG Supports 230 SMEs in boreal aimags Supports >700 other wood-based enterprises
Unlicensed timber	469 million m ³ harvested	MNT 52,802 million retail value MNT 27,078 business profits (MNT 2,829 million public revenues foregone)	
Licensed fuelwood	956 million m ³ harvested	MNT 40,781 million retail value MNT 7,646 million business profits MNT 1,167 million public revenues	
Unlicensed fuelwood	1,964 million m ³ harvested	MNT 62,847 retail value MNT 15,712 million business profits (MNT 3,846 million public revenues foregone)	
Wild plants	4,200 tonnes of NTFP collected	MNT 12,388 million local home consumption value MNT 4,141 million local sale value	Provides food, medicines and income to 65,000 households – average per household value of MNT 260,000/year
Pasture and hay	55,000 ha utilised	MNT 34,359 million livestock gross margins	3.8 million SEU or 12.5% of herds in boreal aimags partially supported Provides grazing sufficient for all livestock for 20,000 households – average per household value of MNT 1,777,000/year
Tourism and recreation	90,000 international visitors	MNT 22,700 million direct spending MNT 1,600 million public revenues MNT 48,835 million wages MNT 93,860 million sales income MNT 28,000 million value-added to economy MNT 17,000 million capital formation	Contributes MNT 144,300 million to GDP Supports 1,000 enterprises, including 300 ger camps in rural areas Supports 15,000 jobs
Licensed hunting	3,000 animals and birds hunted under permit	Between MNT 91 million local trade value and MNT 2.69 billion trophy hunting value MNT 417 million government revenues	
Carbon sink	4.6 million tonnes CO ₂ e sequestered	MNT 77,500 million value	Boreal forest adds carbon values of MNT 7,000/ha/year
Watershed protection	176 million m ³ water regulated	MNT 27,000 million net value added to water users from forest in Tuul watershed MNT 31,500 million added public revenues from forest in Tuul watershed	Forest in Tuul watershed adds water values of MNT 5,400/ha/year Boreal forest areas secure 45 million m ³ water for households, 8 million m ³ water for towns, 34 million m ³ water for industry, 28 million m ³ water for energy sector, 27 million m ³ water for livestock and 35 million m ³ water for irrigation.

FINANCING:

review of forest sector funding flows

This chapter reviews the status of investment and funding flows to the forest sector in Mongolia. Its main findings are:

- The Government of Mongolia provides funding to the forest sector of around MNT 12.5 billion (US\$ 9 million) a year. This equates to annual public spending of MNT 125,000/km² (US\$ 90) of boreal forest in total. On average, public spending on the forest sector is almost three times higher than the public revenues earned from timber, fuelwood and NTFP harvesting.
- Public funding to the forest sector has been rising steadily, and more than doubled in real terms between 2008 and 2012. The share of forests in the total environment budget has however declined over the same period, from a third of all spending in 2008 to less than a fifth in 2012.
- Core institutional costs account for less than 10% of government forest spending, and are dominated by staff costs. More than 90% of the recurrent budget is allocated to on-the-ground forest management activities: pest control, fire management; forest cleaning, thinning and enforcement; reforestation and rehabilitation; inventory and forest organisation; nurseries and seedling preparation; and support to FUG.
- International donor assistance plays a relatively minor role in forest funding, at an average of MNT 2 billion (US\$ 1.5 million) a year or MNT 21,000 (US\$ 15) per km². The forest sector accounted for 0.1% of total bilateral and multilateral development assistance between 1990-2010, and just 3% of environmental spending.
- Most donor-funded forest sector projects have been initiated since 2005. The vast majority of activities concern on-the-ground forest management, development and conservation, with a particular focus on supporting community forest management.

Public funding to the forest sector

How public budget is allocated to the forest sector

The MEGD is mandated to coordinate forest management, development and conservation at the national level, while forest enterprises and industries are controlled under the Ministry of Industry and Agriculture (MIA). In addition to the annual allocations made to the Division of Coordination of Forest Conservation and Reforestation, the Forest Survey and Development Centre and the Forestry National Committee (and formerly the Forest Agency), forestry activities are also included in the spending of MEGD units responsible for protected area administration, desertification control, environmental measurement and nature and environment protection. At the local-level, expenditures on forestry and environmental activities are made through aimag budgets. Although small amounts of recurrent and capital spending are made by other ministries on activities which depend or impact on forests²⁴, these are relatively minor in comparison. A rapid review of sectoral budgets did not highlight any spending that was earmarked specifically for forest activities.

MEGD follows the same budget planning, allocation and administration procedures as all other government agencies in Mongolia. The national budget is approved by Parliament at the beginning of May each year. The

²⁴ For example: the Administration of Land Affairs, Geodesy and Cartography is responsible for characterising and mapping different land categories; the Ministry of Education, Culture and Science oversees education and research.

MEGD's budget request is prepared within this ceiling and associated staffing and cost norms, and then submitted to the Ministry of Finance (MOF) by mid-August. The national consolidated budget is forwarded to Cabinet a month later. The budget is generally approved by mid-November.

Forest sector funds are also channelled through the Nature Protection Fund, a Government special fund²⁵. Government special funds are held in special accounts in the Treasury, and have the purpose of supporting the implementation of particular functions and objectives of the government²⁶. They are resourced from a combination of earmarked revenues, other public budget sources, donations and overseas development assistance. It is primarily resourced through (non-mining) natural resource revenues. As stipulated in the Law on Reinvestment of Natural Resource Use Fees for the Protection of the Environment and the Restoration of Natural Resources 2000, a proportion of the revenues earned from natural plant use fees, game resource use payments, land fees, timber and fuelwood harvesting fees and water and spring use fees are set aside for spending on environmental protection and natural resource restoration activities through the fund²⁷. The Law also states that "matching funds equivalent to at least: (i) 70 percent of the timber and fuelwood revenues; (ii) 20 percent of the land revenues; and (iii) 35 percent of water resources revenues must be spent from the State budget for protection and conservation and/or sustainable management of land, water and forest resources".

It should however be noted that Nature Protection Fund resources are not used only for forest sector activities. The Fund's objectives are broad, and encompass activities to support biodiversity conservation and combat desertification, as well as those addressing other key priorities in the environment and natural resources management sectors.

Public sector funding flows

Public funding to forest sector activities totalled just over MNT 12.5 billion (US\$ 9 million) in 2013 (Table 3). Around 5% comes through local-level budgets, and just under half of this funding is contributed by non-forestry agencies in the MEGD.

Table 3: recurrent funding to the forest sector 2008-13 (2013 MNT billion)

	2008	2009	2010	2011	2012	2013
Current expenditure of Forestry Agency	0.37	0.50	0.42	0.44	0.38	-
Current expenditure of Forestry Department	0.40	0.20	0.16	0.15	0.13	0.14
Current expenditures of Forestry National Committee	0.01	0.02	0.01	0.02	0.02	0.02
Local-level spending on forest staff & activities	0.15	0.32	0.33	0.59	0.23	0.63
Spending on forestry activities	4.05	3.98	6.90	6.28	6.39	5.63
Spending on forestry activities by other agencies	2.18	2.12	2.85	3.31	8.12	6.20
TOTAL	7.17	7.14	10.67	10.79	15.26	12.63

From MOF and MEGD budget data. Forestry Department current expenditures for 2013 estimated as proportion of budget for forestry activities.

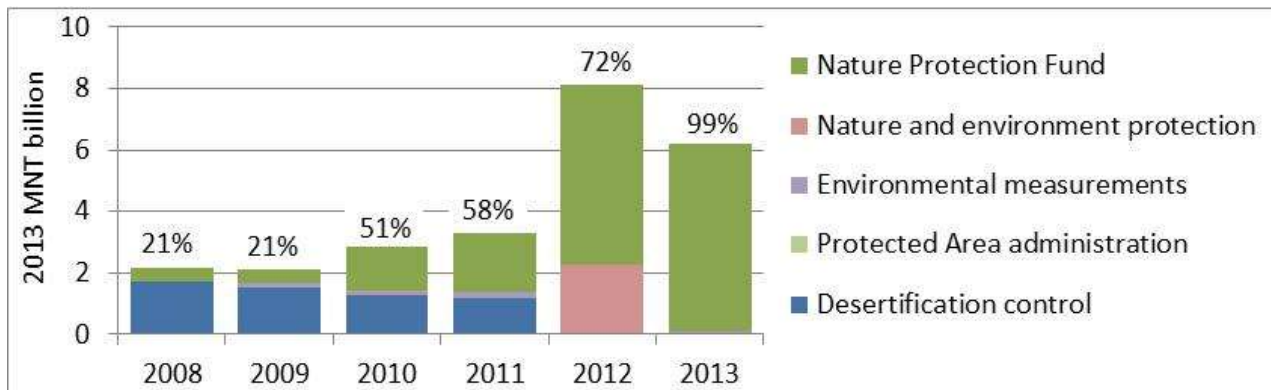
²⁵ Other environment sector Government special funds include the Renewable Energy Fund (which receives revenues from companies in which the government has equity which are participating in emissions reduction trading under the UNFCCC/Kyoto Protocol arrangements), and the Clean Air Fund (which receives revenues from fees on air pollution caused by coal and organic solvents).

²⁶ The Ministry of Finance is apparently currently in the process of updating the regulations and procedures pertaining to special funds, although is not yet clear whether this will have any implications for environment sector funds.

²⁷ These provisions are in turn reflected in the Law on Environmental Protection 1995 (which requires that a portion of natural resource fees and compensatory payments should be paid to the environmental protection fund), Forestry Law 2007 (which requires compensatory duties to be channelled to the environmental protection fund) and the Law on Land Fees 1997 (which allows that an appropriate percentage of land fee revenue shall be expended on land protection, rehabilitation and organisation). It should be noted that the Law on Land Fees is currently undergoing revision, including the rates for possessing and/or using state-owned land.

Funding from MEGD non-forestry agencies comes from five main sources: activities carried out in support of desertification control, Protected Area administration, environmental measurements, nature and environment protection and the Nature Protection Fund (Figure 4). The Nature Protection Fund is by far the most significant source, and has been accounting for a steadily increasing share of funding over time. In 2013, “forestry and tree protection” spending made under the Fund totalled more than MNT 6 billion (US\$ 4.4 million) or 99% of all funding to forestry activities provided from MEGD non-forestry agencies.

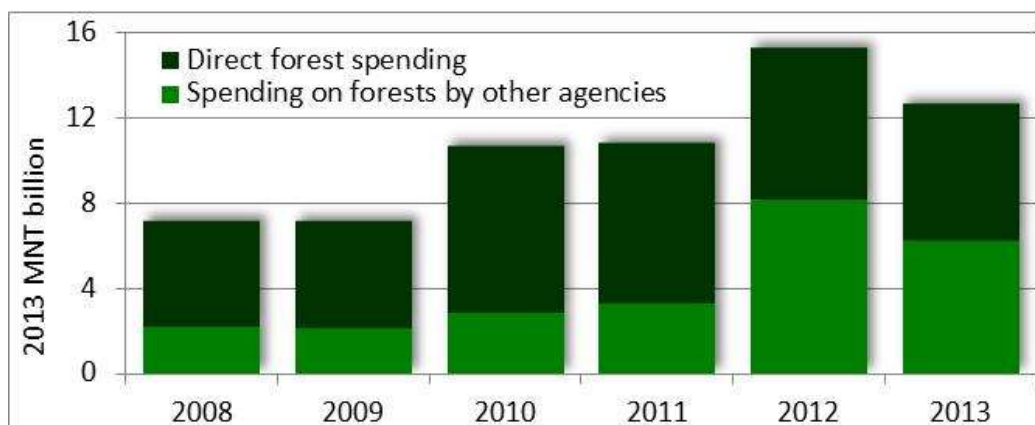
Figure 4: sources of funding to forestry activities from other MEGD agencies



From MOF and MEGD budget data.

Funding to the forest sector has been rising steadily over the last several years: in real terms²⁸, the recurrent budget allocated to forests in 2012 was more than twice as high as that in 2008 (Figure 5). The amount of public budget allocated to forests also remains high as compared to the revenues generated by the sector: between 2008 and 2010, almost three times as much was spent on forestry activities as was earned from timber and fuelwood (Figure 6). While this presents an encouraging picture, it should however be noted that the share of forests in total environmental spending has been steadily decreasing over the last five years: from a third in 2008 to 19% in 2012 (Figure 7). The contribution of the forest sector to the entire government recurrent budget has stayed fairly stable at between 0.2-0.3% of all public spending.

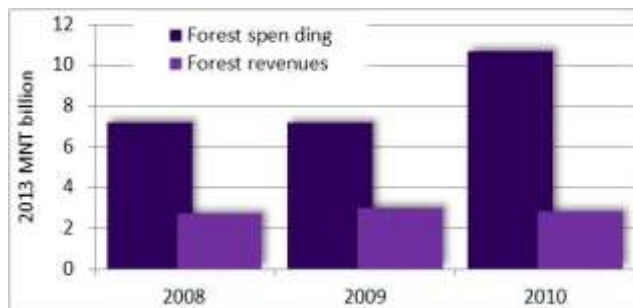
Figure 5: recurrent spending on the forest sector 2008-13



From MOF and MEGD budget data. Direct forest spending includes both core institutional costs and forest management activities. Spending by non-forestry MEGD agencies includes forest management activities only.

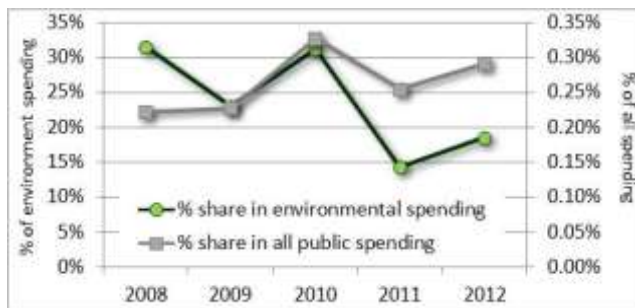
²⁸ Converted to constant 2013 prices.

Figure 6: timber and fuelwood revenues compared to forest spending 2008-10



From MOF and MEGD budget data, NSO 2011. Forest spending includes core institutional costs and forest management activities.

Figure 7: forest sector spending as a proportion of all recurrent expenditures 2008-12

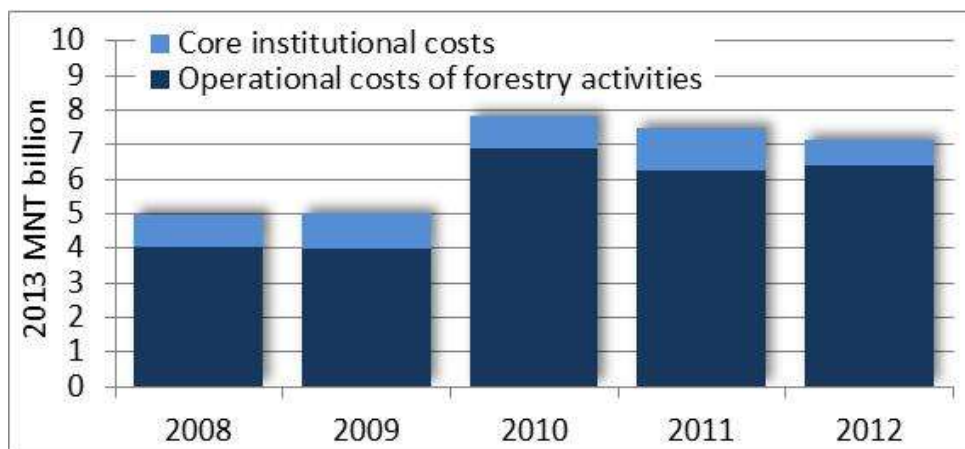


From MOF and MEGD budget data. Forest spending includes core institutional costs and forest management activities.

How government budgets to the forest sector are spent

Core institutional costs such as salaries and staffing, office running costs and maintenance account for only a small share of total forest sector expenditures. More than 90% of the total recurrent expenditures made in 2012²⁹ is accounted for by on-the-ground forestry activities – a share that has been growing over recent years (Figure 8).

Figure 8: distribution of forest spending between institutional and operational costs 2008-12

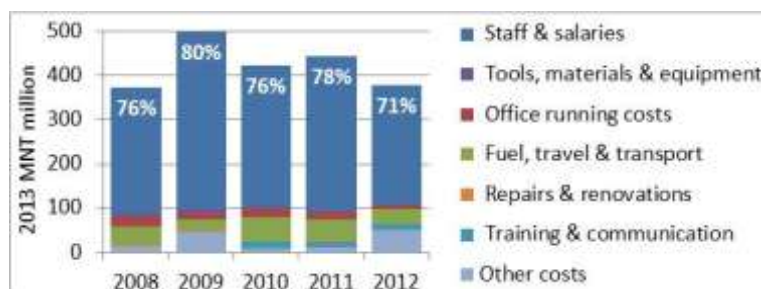


From MOF and MEGD budget data.

Unsurprisingly, core institutional costs are dominated by staff costs. Over the last five years, salaries, wages and other employment benefits have accounted for between 70-80% of the Forest Agency’s core budget (Figure 9). Relatively little money is allocated to other expenditures such as tools and equipment, routine maintenance and repairs, office running, training and communication.

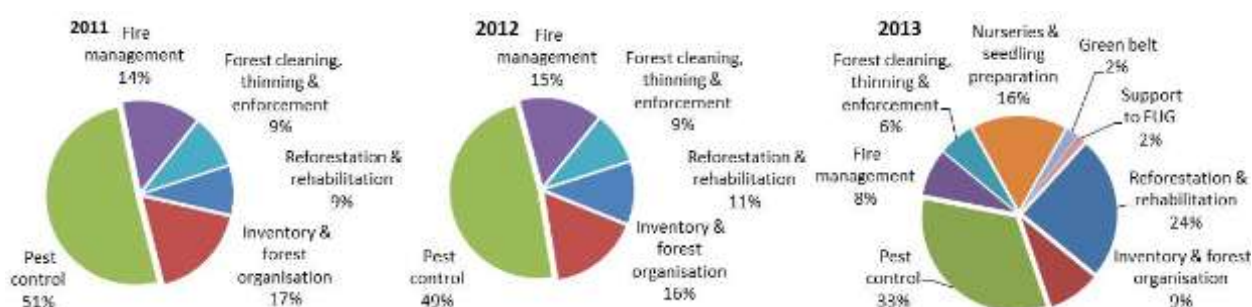
²⁹ It is not possible to make this breakdown for other agencies in MEGD which also make spending on forestry activities.

Figure 9: distribution of Forestry Agency core institutional spending 2008-12



From MOF and MEGD budget data.

Figure 10: purchase of goods, products and services for operational forestry activities 2011-13



From MEGD budget data.

Spending on pest control activities dominates forestry operational budgets. Over the last three years, pest control activities accounted for between a third and a half of all forest management expenditures (Figure 10). Other categories of forest management spending include fire management; forest cleaning, thinning and enforcement; reforestation and rehabilitation; inventory and forest organisation; nurseries and seedling preparation; and support to FUG.

Externally-funded grants to forest sector

International donors make a small contribution to forest sector funding. Forestry spending accounts for a negligible share (around 0.1%) of total development assistance to Mongolia from bilateral and multilateral development agencies³⁰ over the period 1990-2010, and comprises just 3% of all environmental funding³¹.

Sixteen externally-funded projects are recorded for the period 1990-2010, worth just over US\$ 8 million. These involve a relatively small number of donors: the Food and Agriculture Organization of the United Nations (FAO), and the governments of Australia, Germany, Korea and the Netherlands have contributed the vast majority of funding.

Most projects have been initiated only since 2005. Based on commitments made between 2005-10, and assuming that projects last on average 3 years, these data suggest that donor funding to the forest sector currently average around US\$1.5 million a year. The vast majority of activities concern on-the-ground forest

³⁰ Although the forest sector is also supported by funding channelled through international and domestic NGOs and via the corporate sector, it was not possible to obtain quantitative figures on this.

³¹ http://aiddata.org/export/download?filename=AidData_be4fc5b3b234e85fcb472ee7ef8d54f0.xls.zip accessed 21 January 2013.

management, development and conservation, with a particular focus on supporting community forest management. About 10% of spending is on forestry policy, law and administration, and less than 1% is on forests and climate change.

Private and community-level contributions to the costs of forest management

Almost three million hectares or just under a third of the boreal forest estate is being managed under contract by private forestry enterprises (PFE) and community forest user groups (FUG). More than 900 FUG, with over 20,000 members, are operating in boreal forest aimags (Table 10). No information is available on the costs of community forest management, although some government spending in support of FUG is included in the public budget figures presented above. The government is in the process of setting in place a variety of mechanisms which will provide transfer payments and other incentives to FUG, including the preparation of a sub-decree that will allow payments to be collected for forest use and management. Fees will be based on a percentage of the costs of managing the forest, using a standard cost norm calculated to apply to all FUG. This is provisionally calculated at 15% of costs for 0-500m³ of removals, and 20% of costs for 500-1,000 m³ of removals.

More than 100 PFEs are involved in managing and utilising almost 700,000 ha of boreal forest (Table 10). PFEs are required, by law, to re-plant logged areas. A fund administered by MEGD has been established to enable the reforestation of areas deforested by past logging activities and the afforestation of areas considered to have been forested in the past (Crisp *et al* 2004). Funding is available to PFE for activities which aim to “facilitate natural regeneration” and afforest bare or degraded lands. Payments are set at a maximum of between MNT 100,000-135,000/ha for planting activities in the forest steppe zone, and MNT 57,000/ha for facilitating natural regeneration (from Dorjusen and Sainbayar 2004 cited in Mühlenberg *et al* 2006). Fifty percent of this fee is paid in advance, and transfer of the balance is dependent on tree survival rates (Mühlenberg *et al* 2006). As the funding for replanting, reforestation and afforestation by PFEs is provided from public funds, it effectively represents a transfer payment from the state budget, and is therefore covered in the figures presented above on government funding to the forest sector.

In addition to the forest management and utilisation contracts held by FUG and PFE, at least one area of boreal forest is planned to be put under management by government and the private sector to generate carbon credits under the Clean Development Mechanism (CDM). This project is managed by the Mongolia Forest Forum, and involves the reforestation of 300 ha of grassland in Selenge aimag through planting 750,000 *Pinus sylvestris*. The project is anticipated to generate 19,008 removals to the year 2030 at a planned investment of US\$ 328,000 over 3 years and operating costs of US\$ 573,000 over 17 years. Annual CER sales are projected to be US\$ 14,250. As the project concept states that there will be no harvesting of the forest for 100 years, it is not immediately obvious how this project will avoid running at a loss. None of the other four CDM projects that are registered for Mongolia³² or that are listed by the government as being in the official pipeline as a concept, PIN or PDD under development (MNET 2011a) concern afforestation or reforestation.

Various industries (especially construction and mining) incur costs to rehabilitate and revegetate degraded lands and to carry out forest components of environmental management plans, as required by Mongolian law. For example, around 40 hectares ha of forest land is recorded as having been degraded as a result of mining in 2010, and there are currently 759 exploration or mining licences which cover almost 1.5 million ha

³² <http://cdm.unfccc.int/Projects/projsearch.html> accessed 15 March 2013.

of boreal forest (MEGD 2013). It is not clear how much of this land will be revegetated or rehabilitated, or at what future date. The Law to Prohibit Mineral Exploitation in Forest Areas and River Headwaters 2009 allows exploration and mining licences in forest areas and river headwaters to be revoked, on payment of compensation. To date it has been used to suspend 246 mineral licences. However it is not yet fully implemented due to inadequate funds being available to pay compensation.

CONCLUSIONS:

forest financing coverage and effectiveness

This chapter assesses the extent to which existing funding flows match the economic and environmental opportunities associated with the forest sector, and identifies key constraints that need to be addressed in order to improve their effectiveness. Its main conclusions are:

- The study has found that funding to the forest sector totals just under MNT 15 billion (US\$ 11 million) a year, or an average of MNT 146,000/km² (US\$105) of boreal forest. Meanwhile, a partial estimate of the economic value of boreal forest goods and services yields a figure of MNT 431.5 billion (US\$310 million) or an average of over MNT 4 million/km² (US\$ 3,100).
- The values generated by forest goods and services can therefore be seen to be substantial in comparison to the funds invested. The government earns fiscal revenues of almost MNT3 for every MNT 1 of public budget allocated to forests, and every MNT 1 of combined government and donor funding helps to leverage broader benefits to the Mongolian economy worth just under MNT 30.
- Timber and fuelwood production accounts for less than a half of the estimated economic value of the forest sector. Forest values are spread across a wide range of beneficiaries (including herders, SMEs, large companies and urban dwellers), at many levels of scale (household, company, soum, aimag, city and national) and in multiple sectors (such as agriculture, industrial, manufacturing, tourism, energy and water supply).
- In contrast, forest budgets are focused on a fairly narrow range of “traditional” forest production and protection activities, not on securing the broader SFM and socio-economic development objectives which form a part of the stated goals for the forest sector.
- There is thus something of disparity between the management activities on which forest funding is spent, and those which generate the highest economic values. The forest sector has an economic impact and potential which extends far beyond the current management and budgetary focus. This means that prospective investment sources and revenue streams remain untapped, and opportunities to further enhance the economic value-added of forest goods and services are missed.
- Various factors in addition to an overall lack of funds act to constrain more effective forest sector financing and value-addition, including: a narrow funding portfolio, weak application of user pays and cost recovery principles, uneconomic pricing and costing, weak financial and economic incentives for stakeholder engagement and investment in sustainable forest activities, and a disconnect between financial planning and actual operational management needs.

Effectiveness: what are the public returns to forest sector financing?

It is difficult to draw any firm conclusions about forest funding effectiveness. There is little quantitative data on the impacts and outcomes of forest sector activities beyond physical measures of reforested areas and harvested wood volumes. The most recent reviews of the forest sector (Crisp et al 2004, Ykhanbai 2009a), deal mainly with the efficiency of wood harvesting. Their conclusions and recommendations primarily relate to the setting of cutting quotas and harvesting fees, efficiency of wood use, and development of the timber industry. Although useful, this provides few insights about funding effectiveness in relation to the full range of values that forest goods and services generate for the economy.

Funding effectiveness can however also be measured in terms of economic efficiency (value for money) as well as physical indicators of improvement (Markandya 2010). When looked at in this way, it is clear that

forest sector funding gives good value for money in the sense that forest goods and services leverage many economic benefits. Current government and donor spending on forests of just under MNT 15 billion (US\$ 11 million) leverages forest values worth MNT 395 billion (US\$ 284 million) for users and MNT 37 billion (US\$ 26 million) in public revenues. Every MNT 1 invested in the forest sector helps to generate broader benefits worth MNT 30 to the Mongolian economy, and every MNT 1 of government spending earns back MNT 3 in public revenues. It should be noted that wood harvesting activities account for less than half of these figures. Forest values are spread across a wide range of beneficiaries (including herders, SMEs, large companies and urban dwellers), at many levels of scale (in household, company, soum, aimag, city and national economies) and in multiple sectors (such as agriculture, industrial, manufacturing, tourism, energy, water supply and climate).

The key concern is therefore whether funding is being sourced and spent in the most effective way to optimise the value-added of forests to the wider economy, or to best achieve wider sectoral development objectives. The goals that have been stated for the forest sector are fairly broad – including, for example, “protection, possession, sustainable use, restoration and reproduction of forests in Mongolia³³” and creation of “conditions for sustainable use and protection of forest reserves, reforestation and maintaining ecological balance³⁴”. These objectives are wholly consistent with managing forests to generate broader benefits to the economy. However, in contrast, forest funding is focused on a fairly narrow range of management activities and objectives. Many of the economic and funding opportunities associated with the forest sector are not, in reality, being fully captured.

Coverage: do funding flows match forest values?

We can conclude that there appears to be something of a disparity between the management activities on which forest funding is spent, and those which generate the highest economic values.

Expenditures are concentrated mainly on “traditional” forest production and protection activities, not on securing broader SFM and socio-economic development objectives³⁵. This implies that existing funding flows may not be capturing the full economic or financial potential associated with forest goods and services. Key areas of value, and opportunities to increase value-added, through “non-traditional” forest activities and investments, seem to be under-represented in the funding equation.

At the same time, fund generation is also fairly limited as compared to value-added. The forest sector depends primarily on central budget subventions and development assistance, supplemented by a small share of the revenues earned from timber and fuelwood harvesting. This suggests that potentially important funding flows are not being captured. The other sectors that depend on forests for their output and productivity (e.g. agriculture, industry, manufacturing, tourism, energy, water supply and climate) currently make little or no contribution towards the costs of managing, conserving or developing forest land and resources, despite the benefits they gain. The forest sector, and MEGD, is effectively subsidising the provision of these economically valuable goods and services.

Another apparent gap in funding coverage as compared to the distribution of values is the continuing low share of private (including community) investment in SFM – despite an active programme of contracting out

³³ As laid out in the Law on Forestry 2007.

³⁴ As laid out in Strategic Objective 4 on Forests of the National Development Strategy 2007-2012.

³⁵ In other words, rather than on “traditional” forest sector operations, on activities such as collaborative and community-based forest management, the engagement of other sectors in forest management and utilization, and on developing linkages with other sectoral goals such as food production, livestock management and biodiversity-based business.

forest management and harvesting to PFE and FUG. This also represents a missed economic and financial opportunity. Private investments are a potentially important means of reducing government cost burdens, and of leveraging the capital expenditures which are currently lacking in forest sector budgets. Promoting a broader range of value-added forest activities for the private sector could offer opportunities to stimulate this investment.

Constraints and opportunities: what are the needs and potentials to enhance forest sector financing flows?

From the above analysis, it is clear that a number of factors currently act as constraints to forest financing, and that several potentially lucrative opportunities to generate both funding and value-added are being missed. Although an insufficient amount of funds may be a key constraint, it is not the only, or possibly even the most important, one. Effective financing for sustainable forest management has many dimensions, all of which need to be addressed.

The financing portfolio upon which Mongolia's forest sector depends is very narrow. It is based almost wholly on funding accessed from government and donors, and on a limited share of the revenues generated from timber and fuelwood harvesting. As well as limiting the amount of funding available, this is also risky. Should one or more of these sources decline or fail, few alternatives remain with which to fill the resulting gap in financing.

There is an uneven application of user pays and cost recovery principles across forest goods and services. Fees and charges are levied on only a limited range of activities, mainly timber and fuelwood harvesting. Widening the application of cost recovery and user pays to other forest goods and services provides an opportunity not only to supplement forest funding, but also to diversify the purposes, economic benefits and beneficiaries for which the forest estate is managed.

Linked to this are the often uneconomic principles and formulae that are used for forest sector pricing and cost estimation. Cost norms tend to be outdated, and the charges and fees levied on the use of forest land and resources are not always based on market prices or willingness to pay. Although a portion of revenues is earmarked for reinvestment, through the Nature Protection Fund, the percentage actually spent on the forest sector remains small. Rationalising, updating and expanding forest pricing, costing and financial retention procedures would offer the opportunity for the government to better capture forest rents, recover management costs and invest more effectively in the forest sector. It would also provide more realistic market and price signals about the relative costs and benefits of different forest sector activities.

Diversifying the funding and management base of the forest sector provides a potentially important entry point to engage and benefit a much broader range of stakeholders in forest management and use. Yet currently there are weak incentives to invest in SFM. Credit, loans and investment capital for SFM are all difficult to access, and the forest sector is not subject to many of the subsidies and preferential incentives that are accorded to other sectors (for example industry and agriculture). At the same time, sustainable markets for forest goods and services remain undeveloped. Setting in place positive incentives for SFM not only has the potential to enhance forest sector productivity, but also to stimulate new investment and value-added.

Integral to all of these points is the need to overcome the current disconnect between forest sector budgets and the spending that is required to meet the broader SFM objectives that are outlined in national forest

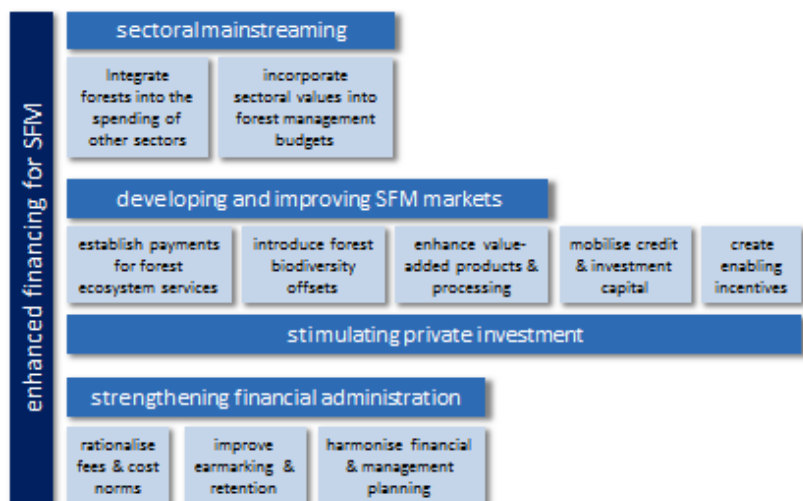
policy. Annual budget preparation and allocation is primarily driven by the ceilings set at the central level through the MOF, and focuses heavily on staffing costs, routine maintenance and a limited range of operational management activities (such as inventory, nurseries, pest control and planting) to which standard cost norms are applied. They are not based on actual SFM needs and costs, or on a strategic assessment of funding requirements, gaps and sources. Harmonising forest sector financial and management planning provides an opportunity to strengthen substantially the level to which essential forest management expenditures are actually funded.

RECOMMENDATIONS: options to enhance financing for sustainable forest management

This chapter identifies policies and instruments that can be used to mobilise additional financing for sustainable forest management, and increase its effectiveness and impacts. Its main recommendations are:

- Building diversified portfolios which better reflect the full range of goods and services associated with the forest sector is key to enhancing long-term sustainable financing for SFM, and increasing the effectiveness and impacts of forest funding.
- One aspect of financial diversification is to extend funding towards non-traditional activities and approaches which will allow a much wider range of values to be generated by forests, and a more diverse group of stakeholders to become engaged in and benefit from their management. The other is to find new ways of capturing these broader values as concrete investments and financing flows for sustainable forest management.
- To these ends, ten financing instruments and policy recommendations are suggested which can be used to mobilise additional funding for sustainable forest management, and increase financing effectiveness and impacts:
 - Integrate forests into the spending of other sectors;
 - Incorporate sectoral values into forest management budgets;
 - Establish payments for forest ecosystem services;
 - Introduce forest biodiversity offset funding arrangements;
 - Enhance value-added from sustainable forest product markets;
 - Mobilise credit and investment capital for SFM;
 - Create enabling incentives for SFM;
 - Rationalise forest sector fees and cost norms;
 - Improve earmarking and retention of forest funds; and
 - Harmonise financial and management planning.

Figure 11: summary of financing instruments and policy recommendations for SFM



The previous chapter concluded that building diversified portfolios which better reflect the broad range of values associated with forest goods and services is key to enhancing long-term sustainable financing for SFM, and increasing the effectiveness and impacts of forest funding. This has two aspects. One is to extend funding towards developing non-traditional activities and approaches which will allow a much wider range of values to be generated by forests, and a more diverse group of stakeholders to become engaged in and benefit from their management. The other is to find new ways of capturing these broader values as concrete investments and financing flows for SFM.

Ten financing instruments and policy recommendations are suggested below which can be used to mobilise additional funding for sustainable forest management, and increase its effectiveness and impacts. These span sectoral mainstreaming, developing and improving SFM markets, stimulating private investment, and strengthening financial administration (Figure 11).

Integrate forests into the spending of other sectors

It is clear that financing for SFM cannot be limited to the forest sector in its traditional production-oriented sense (Indufor 2010), and that the spending made by MEGD should not be the only source of funding for forest management activities. There is also scope for accessing financial resources from the other sectors that gain from forest goods and services. Mainstreaming has particular relevance to forest-dependent sectors such as water, tourism, energy, industry and agriculture, as well as in relation to cross-cutting policy objectives such as climate change, desertification and disaster risk reduction.

Current government policy lends support to sectoral mainstreaming. It is implied by Mongolia's strategic focus on green development, which aims to ensure the integration of environmental protection and economic development goals. Mainstreaming can also be seen as a means of contributing towards better meeting the income, output and employment targets specified for the sectors of the economy that depend on forest goods and services. It is also worth noting that the donor community has stated its commitment to funding integration, alignment and harmonisation via the Paris Declaration on Aid Effectiveness. The integrated financing strategy of the Global Mechanism of the United Nations Convention to Combat Desertification (UNCCD) is one example of how these principles have been operationalized in Mongolia, in the context of sustainable land management.

Incorporate sectoral values into forest management budgets

Sectoral mainstreaming also implies efforts to better integrate the goals and policy objectives of other sectors into forest management approaches and budgets. This serves an important function of diversifying the purposes for which forests are managed, and thus increasing the value-added by the forest sector to the economy. It has particular relevance to SFM objectives relating to the protective and socio-economic functions of forest lands and resources, including those associated with the development of REDD+ mechanisms.

The consistency of sectoral mainstreaming and budget harmonisation with current government and donor policy has already been described above. Incorporating sectoral values into forest management budgets is also a way of better supporting the broad range of policy goals and objectives that have been stated for the forestry sector, which extend beyond pure production and protection.

Establish payments for forest ecosystem services

Payments for ecosystem services (PES) are mechanisms which create a price and market for economically valuable forest services, thereby allowing forest managers to capture additional revenue and income. They are now widely used in other parts of the world to generate funding for SFM, and have much potential for development in Mongolia. Watershed protection, carbon sequestration, biodiversity and landscape services have been identified as offering particular opportunities (Erdenesaikhan 2011). PES may involve payments being made directly by forest ecosystem service beneficiaries (e.g. bulk water users, hydropower facilities, greenhouse gas emitting industries, tourism companies) as well as through budgetary transfers targeting a portion of the revenues earned by other sectors for forest-dependent production and consumption (e.g. water, tourism, industry, energy, agriculture).

Developing forest PES is a way of further operationalizing the cost-recovery and user pays principles that are implied in the Environmental Protection Law 1995 and are being promoted by the MOF and MED as part of Mongolia's continuing transition to a market economy. "Schemes such as payment for ecosystem services and other economic instruments that produce resource savings and productivity" are mentioned explicitly in the Draft Strategy for Green Economy. A variety of recommendations on the development of market-based instruments are further suggested in the National Environmental Action Plan 2012-21 and National Biodiversity Conservation Action Plan. The establishment of watershed PES is already being investigated as a means of financing forest management in the Upper Tuul basin, and forest carbon-based PES are currently under development via ongoing national REDD+ and CDM programmes.

Introduce forest biodiversity offset funding arrangements

Biodiversity offsets are a means of generating finance for forest restoration, rehabilitation and sustainable management. Funding is provided by developers to balance or compensate the residual effects of damages that cannot be mitigated on-site, by investing in the sustainable management of equivalent forest resources or habitats elsewhere. Their main application is in relation to the disturbance to forests caused by extractive industries and infrastructure. Biodiversity offsets have particular relevance to ongoing developments in the mining, construction and infrastructure industries as well as to forest harvesting concessions.

Biodiversity offsets are consistent with the principles of environmental compensation and the responsibility of developers to finance environmental remediation, restoration and management which are specified in the Law on Environmental Protection 1995 and sectoral legislation relating to extractive industries. They are also explicitly mentioned in the Draft Strategy for Green Economy, and meet the need identified in the Government Platform 2012-16 of linking the mining sector and other large project funding to green development policy. Biodiversity offsets have recently emerged as a topic of discussion in Mongolia, especially in relation to the mining industry. One example of a offset that is already under development is the Ivanhoe Mines/Rio Tinto Oyu Tolgoi project.

Enhance value-added from sustainable forest product markets

Improving SFM markets and prices provides an opportunity for forest users and managers to better capture new sources of income and value-added from SFM. It affords an opportunity to enhance the private profitability and returns to SFM as compared to, or in combination with, other land and resource use options. It has particular relevance for FUG and PFE that are involved in forest management, harvesting, marketing and processing. Developing sustainable forest product markets also offers opportunities to supplement the fee base from which public revenues are generated. Several opportunities for market

development and value-added through forest production, processing and marketing have already been identified for Mongolia, including wood products and NTFP (Crisp *et al* 2004, FAO 2006, Mühlenberg *et al* 2006, Ykhanbai 2009a) and nature-based tourism (Government Platform 2012-16, MRTT 2013, UNCTAD 2012).

Enhancing the value-added from sustainable forest product markets is consistent with several of the overarching policy goals stated in the Comprehensive National Development Strategy of Mongolia 2007-21, including rural income diversification and value-addition, development of manufacturing and industry and export promotion. It also lends support to current forest policy objectives of increasing PFE and FUG participation in forest management. A number of recent and ongoing initiatives led by government and with the assistance of international organisations (for example FAO, GIZ, UNDP and the World Bank), provide important experiences and lessons learned on possible strategies and ways forward in the development of sustainable wood and non-wood production and processing activities.

Mobilise credit and investment capital for SFM

The availability of credit, investment funds and start-up capital is a key enabling condition for the development of SFM-based activities, markets and enterprises (including those associated with REDD+), and especially for increased participation of the private sector (including PFE and FUG). Several possibilities exist to improve credit and loan availability for SFM activities, as well as to mobilise investment capital from both domestic and international sources. One important opportunity is to work with banks and other financial institutions to improve lending to the forest sector and SFM. Some of the classic difficulties associated with forest sector loans, such as lack of collateral, relatively long maturity period and uncertain future income streams, may be at least partially overcome by public guarantee and support. The practice of using trees or forest areas as collateral for lending, which has been introduced in several other Asian countries³⁶, might also prove viable in Mongolia in cases where PFE or FUG have been assigned secure contractual rights. There is, globally, a growing market in the mobilisation of capital and equity for SFM from outside the forest sector. This includes capital market instruments such as forest-backed bonds, and other indirect investment products such as forest and land investment trusts and funds.

Mobilising investment capital and lending for SFM is consistent with the aim to “initiate banking, financial and economic policy in promoting green investment” that is stated in the Draft Strategy for Green Economy. Green lending facilities are already starting to emerge in Mongolia, although as yet offer few products targeted specifically at the forest sector or SFM. For example, Golomt Bank’s project financing department supports business loans to projects that protect the environment, and XacBank offers credit and microfinance through a Eco Products Unit which focuses on energy-efficient and environmentally-friendly technology (MNET 2011a).

Create enabling incentives for SFM

There remain very few incentives targeted to the forest sector, outside of commercial timber production and harvesting. Likewise, SFM and sustainable forest enterprises are not subject to many of the investment stimuli currently being offered to other sectors. A variety of economic, financial and fiscal incentives could assist in making SFM (including REDD+ initiatives) more competitive as compared to other land, resource and investment options, and increase its profitability and attractiveness to forest managers, land and resource users. Examples of SFM incentives that are commonly used in other parts of the world include tax relief,

³⁶ For example tree banks in Thailand and forest-based mortgages in China.

preferential credit and loans, subsidised interest rates and investment guarantees. While their impacts as regards plantation forestry has been mixed, some successes have been registered with respect to natural forest management.

Increasing the role of the private sector trade and investment flows is an overarching goal of Mongolian economic and development policy, and a variety of fiscal instruments and incentive packages have been introduced to encourage this. The creation of enabling incentives specifically for SFM is consistent with the “economic incentives” mentioned in the Law on Forests 2007 and Environmental Protection Law 1995 and the “economic instruments” referred to in the Draft Strategy for Green Economy. They also lend support to the development of incentive systems that balance economic and ecological benefits, as mentioned in the National Environmental Action Plan (MNET 2011b).

Rationalise forest sector fees and cost norms

Rationalising forest sector fees and cost norms provides a means of improving the extent to which government is able to capture a share of forest sector rents and recover forest management costs. One area of opportunity is to expand the range of forest activities on which charges are levied, and thus to expand and diversify the public revenue base. Many of the new markets, products and services mentioned in this chapter offer the possibility of generating new revenue streams for government. Another key need is to revise fee levels in line with current market demand and willingness to pay – and to ensure that they are updated regularly, as prices and costs change. Similar revisions need to be applied to the cost norms that determine how much funding is requested and allocated for different forest management activities. Norms should reflect (and attempt to recover) the real costs of undertaking these activities, as well as spanning the full range of activities that are associated with SFM.

Addressing current revenue leakages can also improve the status of forest funding. One aspect of this is to improve collection rates. Another, related, constraint is that the government is currently foregoing a substantial amount of revenue because of unlicensed wood extraction. Whether or not these foregone revenues can be better captured however depends on a number of non-financial factors: most importantly determining an economically and ecologically sustainable annual allowable cut, as well as the ability to enforce harvesting regulations and penalty procedures effectively.

Improve earmarking and retention of forest funds

Tapping into new funding sources will not automatically translate into improved budgets for SFM. Unless these income streams are reinvested in the forest sector, they will have little impact on the availability or effectiveness of funding for SFM. The law³⁷ already allows both for the earmarking and retention of forest revenues, fines and penalties in the Nature Protection Fund and for the ring-fencing of matching funds to be spent from the state budget. Yet the target of these funds is “environmental protection and natural resource restoration” more generally: the share to be reinvested directly in forest activities is not specified.

There are several options to improve the extent to which new and existing revenue streams are earmarked, retained and reinvested in SFM activities. It has become relatively common for countries to establish national forest funds in order to attract and administer financing for SFM. Although this possibility is already enabled by law in Mongolia³⁸, it is less certain that there would be any advantage from establishing a

³⁷ Law on Reinvestment of Natural Resource Use Fees for the Protection of the Environment and the Restoration of Natural Resources 2000.

³⁸ Law on Special Government Funds 2006.

dedicated forest fund. This would run the risk of duplicating and/or undermining the functions of the existing Nature Protection Fund. A more effective course of action might be to ensure that a clear formula is agreed and applied to ensure the reinvestment of a sufficient portion of revenues in the forest sector. This could, if necessary, be supported by the establishment of a SFM window or sub-account within the Nature Protection Fund. The current updating by the Ministry of Finance of the regulations and procedures for government special funds may provide an opportunity for this revision to be made, as may the ongoing development of financial administration and benefit-sharing mechanisms for REDD+.

Harmonise financial and management planning

In order to mobilise additional funding for SFM, it is necessary to know what the financing requirements are. At the moment no such figure exists beyond the budget projections that are routinely made by the Division of Coordination of Forest Conservation and Reforestation and the Forestry National Committee. However, forest sector budgets are formulated primarily as a means of justifying the spending of a largely pre-determined allocation from central government. They are not necessarily based on the real operational management needs of implementing SFM or on the actual costs of carrying out SFM activities.

The development of a national forest financing strategy provides a means of defining spending requirements, funding gaps and financing needs. It directly links funding to the operational management needs that have been defined for SFM. A financing strategy would not only identify how much money is needed for different activities, but also help to locate the most appropriate funding sources and determine the other actions which are required to overcome financial constraints to effective SFM. It could thus also help in communicating and justifying the funding requests made to central government, other donors and potential investors. These principles fit well with the programme-based budgeting and medium-term expenditure frameworks being promoted by MOF, and the emphasis in the Government Platform 2012-16 on planning public investments on a five-year basis. REDD+ readiness actions and implementation, as this reported start off from the REDD+ angle, along with those measures mentioned above can be put together holistically through such a strategy to strengthen and increase SFM financing for the country.

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Data annex

Table 4: forest area in Mongolia 1990-2010 (ha '000)

Management category	1990	2000	2005	2010
Coniferous and deciduous forest	12,536	11,717	11,308	10,898
Saxaul and shrub forest	4,855	3,401	2,764	1,947
Total	17,391	15,118	14,072	12,845

From FAO 2010

Table 5: forest areas by aimag, 2010 (ha)

Aimag	Forest cover	Logged area	Tree nursery	Regeneration	Non-forest	Total
Arkhangai	847,490	2,764	-	-	232,367	1,082,621
Bayan-Olgii	22,322	246	9	-	-	22,577
Bulgan	1,428,546	7,887	41	468,425	-	1,904,898
Darkhan-Uul	71,421	387	30	-	-	71,838
Dornod	61,312	41,770	-	32,545	-	135,627
Khentii	980,150	1,175	12	79,201	71,079	1,131,617
Khovsgol	3,383,996	36,315	3	57,070	527,982	4,005,366
Orkhon	15,576	-	17	-	17	15,610
Ovorkhangai	147,191	2,801	-	42,286	-	192,278
Selenge	1,376,623	20,638	15	38,306	98,529	1,534,111
Tov	492,904	3,384	7,512	1,549	39,162	544,511
Ulaanbaatar	68,508	12	1,104	154	7,269	77,047
Uvs	72,527	4,506	90	33,091	-	110,213
Zavkhan	463,235	5,039	51	-	22,405	490,730
TOTAL	9,431,801	126,924	8,884	752,627	998,810	11,319,044

From Administration of Land Affairs, Geodesy and Cartography

Table 6: forest areas and types by aimag, 2012 (ha)

Aimiag	All forest	Boreal forest	% forest in aimag boreal	% of all boreal forest in aimag
Khovsgol	4,209,000	4,209,000	100.0%	30.2%
Selenge	1,931,200	1,931,200	100.0%	13.9%
Bulgan	1,917,700	1,917,700	100.0%	13.8%
Khentii	1,783,900	1,783,900	100.0%	12.8%
Tov	1,445,300	1,445,300	100.0%	10.4%
Arkhangai	1,008,600	1,008,600	100.0%	7.2%
Zavkhan	777,900	777,900	100.0%	5.6%
Dornod	188,800	188,800	100.0%	1.4%
Uvs	185,600	185,600	100.0%	1.3%
Ovorkhangai	246,900	171,100	69.3%	1.2%
Ulaanbaatar	116,000	116,000	100.0%	0.8%
Darkhan-Uul	79,000	79,000	100.0%	0.6%
Bayan-Olgii	68,100	68,100	100.0%	0.5%
Orkhon	17,800	17,800	100.0%	0.1%
Bayankhongor	584,400	23,700	4.1%	0.2%
Govi-Altai	1,934,500	8,800	0.5%	0.1%
Omnogovi	1,173,900	-	0.0%	0.0%
Khovd	644,400	-	0.0%	0.0%
Dornogovi	194,700	-	0.0%	0.0%
Dundgovi	58,000	-	0.0%	0.0%
Govisumber	-	-	0.0%	0.0%
Sukhbaatar	-	-	0.0%	0.0%
Total	18,565,700	13,932,500		100.0%

From Forest Survey and Development Centre, MEGD.

Table 7: main boreal forest species by aimag, 2010 (ha)

Aimag	Larch	Birch	Siberian pine	Scots pine	Aspen	Spruce	Other Species	Total
Arkhangai	768,245	2,963	14,858	-	4,064	-	9,359	799,489
Bayan-Olgii	35,634	100	10	-	2,748	385	3,466	42,343
Bulgan	979,172	264,499	18,096	31,669	996	471	20,104	1,315,007
Darkhan-Uul	382	44,897	-	14,615	82	-	1,696	61,672
Dornod	10,668	67,503	-	22,621	1,696	-	7,833	110,321
Khentii	776,547	156,517	79,096	61,441	14,798	155	32,873	1,121,427
Khovsgol	3,142,057	55,776	99,380	3,420	2,943	6,277	9,894	3,319,747
Orkhon	14,078	1,519	-	-	-	-	-	15,597
Ovorkhangai	114,370	1,668	17,934	-	563	-	100	134,635
Selenge	404,065	520,137	163,056	276,294	1,746	6,028	26,072	1,397,398
Tov	504,753	111,000	273,254	76,549	1,967	4,429	5,861	977,813
Ulaanbaatar	49,629	7,306	13,827	9,935	416	1,640	4,379	87,132
Uvs	141,357	1,315	1,527	-	11,140	330	41,678	197,347
Zavkhan	426,621	-	3,121	-	-	6,694	6,152	442,588
Other aimags	34,689	1,372	-	-	549	-	7,415	44,025
TOTAL	7,402,267	1,236,572	684,159	496,544	43,708	26,409	176,882	10,066,541

From Forest Survey and Development Centre, MEGD.

Table 8: land area and population in aimags which contain boreal forest, 2010-13

Aimag	Area (km ²)	Persons				Households			
		2010	2011	2012	2013	2010	2011	2012	2013
Arkhangai	55,314	84,583	82,365	80,206	78,103	23,777	7,238	2,204	671
Bayan-Olgii	45,705	88,056	85,588	83,190	80,859	15,764	3,073	599	117
Bulgan	48,700	53,653	53,149	52,649	52,155	9,527	1,740	318	58
Darkhan-Uul	3,275	94,620	92,617	90,657	88,739	26,661	8,010	2,407	723
Dornod	123,597	69,552	67,318	65,156	63,063	15,234	3,680	889	215
Khentii	80,311	65,811	72,392	79,631	87,594	19,660	4,412	990	222
Khovsgol	104,820	114,924	115,260	115,597	115,935	40,378	14,063	4,898	1,706
Orkhon	840	90,699	72,026	57,197	45,421	15,753	5,463	1,895	657
Ovorkhangai	62,900	101,314	100,401	99,497	98,600	32,897	10,976	3,662	1,222
Selenge	41,153	97,584	101,049	104,636	108,351	32,286	9,620	2,867	854
Tov	74,000	85,168	87,826	90,567	93,394	26,559	7,553	2,148	611
Uvs	69,600	73,328	72,387	71,457	70,540	13,106	2,435	452	84
Zavkhan	82,500	65,481	66,146	66,817	67,496	12,058	2,154	385	69
TOTAL	792,715	1,084,773	1,068,524	1,057,258	1,050,250	283,659	80,419	23,713	7,208

From NSO 2011, projected to 2011, 2012, 2013. Excludes Ulaanbaatar.

Table 9: populations in forested soums, 2013

Aimag	No soums with forest	Area of forested soums (km ²)	Area of forest (ha)	Population of forested soums	Households in forested soums	% aimag population in forested soums	% soum area forested
Arkhangai	16	51,059	1,008,613	53,592	16,315	69%	20%
Bayan-Olgii	6	23,868	66,302	26,545	5,175	33%	3%
Bulgan	11	29,095	1,889,578	31,356	5,728	60%	65%
Darkhan-Uul	3	3,077	78,772	14,676	4,409	17%	26%
Dornod	7	68,986	241,964	17,983	4,344	29%	4%
Khentii	8	42,271	1,751,225	28,754	6,453	33%	41%
Khovsgol	23	101,436	4,208,595	82,987	28,903	72%	41%
Orkhon	2	844	17,792	43,221	14,990	95%	21%
Ovorkhangai	10	39,125	295,846	48,805	16,283	49%	8%
Selenge	5	20,801	1,469,572	44,614	13,294	41%	71%
Tov	20	59,014	1,445,269	67,176	19,103	72%	24%
Uvs	16	57,275	236,629	62,785	11,665	89%	4%
Zavkhan	18	62,982	777,650	41,486	7,412	61%	12%
TOTAL	145	559,833	13,487,807	563,979	154,074	54%	24%

From data collected from aimag/soum administration. Covers soums with more than 1,000 ha forest.

Table 10: forest contracted out to FUG and PFE, 2013

Aimags	No. FUG	No. FUG members	Area held by FUGS (ha)	No. PFE	Area held by PFE (ha)	Total contract area (ha)
Arkhangai	60	2,655	180,834	1	4,501	185,335
Bayan-Olgii	28	1,258	10,803			10,803
Bulgan	97	1,572	400,294	8	69,863	470,157
Darkhan-Uul	60	881	94,238	6	3,198	97,436
Dornod	28	283	89,790	3	12,099	101,889
Khentii	28	708	99,479	3	12,382	111,861
Khovsgol	153	3,181	415,075	*		415,075
Orkhon	16	123	8,549			8,549
Ovorkhangai	48	1,206	55,571	1	500	56,071
Selenge	138	2,938	429,935	65	473,257	903,192
Tov	172	4,270	242,914	29	100,200	343,114
Ulaanbaatar	8	174				-
Uvs	27	564	21,476			21,476
Zavkhan	55	1,575	193,740	1	4,935	198,675
TOTAL	918	21,388	2,242,698	117	680,935	2,923,633

From Forest Survey and Development Centre, MEGD.

Table 11: boreal forest area by management category and function 1990-2010 (ha '000)

Management category	Primary designated function	1990	2000	2005	2010
Strictly Protected Area	Biodiversity conservation	6,043	5,539	5,346	5,152
Protected Area	Soil and water protection, social services	5,638	5,395	5,205	5,016
Utilisation Forest	Production	856	785	757	730
Total		12,536	11,717	11,308	10,898

From FAO 2010

Table 12: forest harvesting potential from utilisation, 2010 (m³ '000)

Aimags	Harvesting maximum			Harvest area (ha)	Actual harvest			Revenues (current MNT '000)
	Timber	Fuelwood	Total		Timber	Fuelwood	Total	
Arkhangai	6	92	98	272	6	92	98	134,500
Bayan-Olgii	0	9	9	1,000	0	8	8	17,102
Bulgan	11	79	90	420	11	62	72	241,413
Darkhan-Uul	1	5	7	140	1	5	6	9,651
Dornod	2	14	16	151	2	14	16	56,268
Khentii	9	33	42	373	3	24	27	90,816
Khovsgol	15	161	176	3,699	15	214	229	275 725.5
Orkhon	-	1	1	150		1	1	2,640
Ovorkhangai	1	19	20	562	1	21	23	58,896
Selenge	62	119	180	1,341	32	26	58	437,223
Tov	11	58	69	329	8	26	33	198,080
Ulaanbaatar	0	3	3	110	0	4	4	32,329
Uvs	1	35	36	1,275	3	36	39	60,000
Zavkhan	4	111	115	84	5	50	55	122,968
TOTAL	124	738	862	9,906	88	583	671	1,461,885

From Forest Survey and Development Centre, MEGD.

Table 13: forest harvest volume 2001-2010 (m³ '000)

Aimags	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Arkhangai	11.0	85.5	86.6	86.6	115.8	65.9	69.5	65.9	66.5	98.4
Bayan-Olgii		13.7	12.6	10.8	3.0	3.8	5.0	8.0	5.4	8.2
Bulgan	9.4	54.4	72.0	76.6	93.6	56.0	48.5	70.2	74.7	84.0
Darkhan-Uul	51.4	3.3	4.2		3.7	3.7	4.5	4.0	4.0	6.6
Dornod	6.7	14.6	13.8	16.4	19.6	13.9	18.0	18.5	15.5	16.8
Khentii	14.5	42.5	33.2	27.8	21.3	21.7	12.4	18.7	29.0	27.0
Khovsgol	126.9	130.1	134.5	133.4	123.2	135.0	136.6	115.7	145.7	201.5

Aimag	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Orkhon	0.4	0.6	1.2	1.5	1.6	0.9	0.9	0.9		1.2
Ovorkhangai	60.2	15.2	16.0	16.0	16.5	16.5	12.6	9.3	19.3	22.8
Selenge	107.0	56.7	88.2	63.4	81.1	85.5	78.3	102.5	16.2	133.5
Tov	22.1	29.4	30.2		32.0	29.8	35.5	39.5	45.0	33.1
Ulaanbaatar	7.6	8.1	7.2		5.4	4.5	4.4	3.5	2.3	3.9
Uvs	35.5	40.2	22.8	40.2	26.0	36.8	32.8	28.7	39.5	29.8
Zavkhan	35.0	70.3	51.8	53.8	58.0	86.1	104.0	108.0	108.0	16.8
TOTAL	487.7	564.6	574.3	526.5	600.8	560.1	563.0	593.4	571.1	683.6

From NSO 2011

Table 14: forest harvests from thinning and cleaning, 2010 (m³ '000)

Aimag	Area (ha)	Timber	Fuelwood	Total
Arkhangai	83	3	11	14
Bayan-Olgii	1,000	0	8	8
Bulgan	66	1	3	3
Darkhan-Uul	140	1	0	1
Dornod	258	2	14	16
Khentii	373	3	24	27
Khovsgol	3,699	14	145	159
Orkhon	72	-	0	0
Ovorkhangai	562	1	21	23
Selenge	3,580	0	13	14
Tov	329	3	26	28
Ulaanbaatar	110	0	4	4
Uvs	937	3	36	39
Zavkhan	701	5	50	55
TOTAL	11,910	36	356	392

From Forest Survey and Development Centre, MEGD.

Table 15: boreal forest protected areas 2012 (km²)

Protected areas	Type	PA area	Boreal forest area	Forest as % of PA	Aimags
Khan Khentii	Strictly Protected Area	17,481	10,734	61%	Tuv, Khentii, Selenge
Zed-Khantai-Buteel nuruu	Strictly Protected Area	6,043	3,554	59%	Bulgan
Khuvsgul lake	National Park	11,756	3,155	27%	Khuvsgul
Tengis-Shishkhed	National Park	8,757	2,645	30%	Khuvsgul
Khangain nuruu	National Park	9,066	1,526	17%	Arkhangai
Numrug	Strictly Protected Area	3,210	1,486	46%	Dornod
Tarvagatain nuruu	National Park	5,476	1,378	25%	Zavkhan
Gorkhi-Terelj	National Park	2,918	1,375	47%	Tuv
Khan Khukhii	National Park	2,216	556	25%	Uvs
Onon-Balj A;B	National Park	4,005	530	13%	Khentii, Dornod
Khan Jargalant uul	Natural Reserve	629	448	71%	Bulgan
Tujiin nars	National Park	708	409	58%	Selenge
Khoridol Saridag	Strictly Protected Area	2,267	302	13%	Khuvsgul
Dayan deerkjiin agui	Natural Monument	313	244	78%	Khuvsgul
Bogdkhaan mountain	Strictly Protected Area	413	205	50%	Ulaanbaatar
Namnan uul	Natural Reserve	297	170	57%	Bulgan
Other PAs		20,449	707	3%	
TOTAL		96,004	29,423	31%	

From Protected Area Administration Division, MEGD; GIZ 2012.

Table 16: timber harvests 2011-12

Aimag	2011		2012	
	Timber (m ³ '000)	Revenues (current MNT '000)	Timber (m ³ '000)	Revenues (current MNT '000)
Arkhangai	7.21	45,800	18.09	117,786
Bayan-Olgii	0.11	1,700	0.48	3,300
Bulgan	14.35	117,500	34.08	255,879
Darkhan-Uul	1.55	9,800	2.12	26,100
Dornod	7.72	62,900	11.36	78,170
Khentii	9.67	53,500	21.13	63,826
Khovsgol	16.66	137,200	50.73	200,659
Orkhon	-	-	0.73	7,105
Ovorkhangai	2.68	17,400	2.42	27,520
Selenge	60.71	285,800	61.34	366,740
Tov	5.25	124,900	6.77	99,195
Ulaanbaatar	1.90	23,600	4.42	49,430
Uvs	2.82	22,800	10.25	32,273
Zavkhan	4.08	40,400	11.19	89,337
TOTAL	134.71	943,300	235.10	1,417,320

From Forest Survey and Development Centre, MEGD.

Table 17: fuelwood harvests 2011-12

Aimag	2011		2012	
	Fuelwood (m ³ '000)	Revenues (current MNT '000)	Fuelwood (m ³ '000)	Revenues (current MNT '000)
Arkhangai	115.54	212,400	75.73	95,739
Bayan-Olgii	8.59	32,600	8.98	24,900
Bulgan	99.13	218,100	76.48	168,257
Darkhan-Uul	6.25	21,100	4.60	11,167
Dornod	12.03	27,100	12.25	28,770
Khentii	27.19	48,300	35.39	95,739
Khovsgol	235.00	290,900	218.31	303,997
Orkhon	3.00	6,600	2.80	6,160
Ovorkhangai	27.51	51,400	22.93	52,799
Selenge	31.59	71,400	26.72	63,290
Tov	27.37	83,200	26.40	103,959
Ulaanbaatar	46.15	14,700	4.32	14,639
Uvs	35.29	56,600	31.58	63,371
Zavkhan	69.04	127,200	49.53	134,005
TOTAL	743.67	1,261,600	596.01	1,166,790

From Forest Survey and Development Centre, MEGD.

Table 18: recorded illegal logging, 2010

Aimag	Confiscated timber (m ³)	Penalties & fines (current MNT '000)
Arkhangai	163	7,608
Bayan-Olgii	29	400
Bulgan	773	9,034
Darkhan-Uul	45	2,562
Dornod	150	4,692
Khentii	398	44,144
Khovsgol	1,185	256,300
Orkhon	238	7,515
Ovorkhangai	460	17,625
Selenge	527	61,169
Tov	86	35,851
Ulaanbaatar	23	20
Uvs	192	3,302
Zavkhan	501	4,614
TOTAL	4,770	454,836

From Forest Survey and Development Centre, MEGD.

Table 19: licensed removal of non-timber forest products 2010 (kg)

Aimag	Spruce/ pine nuts	Wild berries	Other NTFP
Arkhangai	-	3,000	-
Bayan-Olgii	-	1,500	-
Bulgan	-	-	-
Darkhan-Uul	-	-	6,200
Dornod	-	2,500	-
Khentii	-	10,750	-
Khovsgol	620	10,240	4,300
Orkhon	-	-	-
Ovorkhangai	-	-	-
Selenge	-	52,880	11,000
Tov	-	400	-
Ulaanbaatar	-	-	-
Uvs	-	210,050	-
Zavkhan	-	1,300	-
TOTAL	620	292,620	21,500

From Forest Survey and Development Centre, MEGD.

Table 20: Aimag staffing and expenditures on forest activities (2013 MNT '000)

Aimag	Number of forest staff	Number of other environment staff	Imputed expenditures on forest activities
Arkhangai	1	3	23,193
Bayan-Olgii	2	1	30,924
Bulgan	5	3	46,386
Darkhan-Uul	1	1	-
Dornod	5	0	24,352
Khentii	8	5	132,206
Khovsgol	10	11	103,397
Orkhon	1	0	56,220
Ovorkhangai	3	3	31,042
Selenge	8	8	61,976
Tov	3	3	37,820
Ulaanbaatar	2	1	-
Uvs	9	5	28,347
Zavkhan	3	0	54,854
TOTAL	61	44	630,716

From Forest Survey and Development Centre, MEGD. Where data are missing for 2012, 2011 figures are used.

Table 21: general government revenues 2007-10 (current MNT '000)

	2007	2008	2009	2010
Fee on usage of timber	1,481,528	1,550,454	1,758,192	1,981,943
Hunting fee	3,091,909	3,628,369	4,601,652	3,698,016
Total forestry-sector taxes	4,573,437	5,178,823	6,359,844	5,679,959
As % of all tax revenues	0.3%	0.3%	0.4%	0.2%

From NSO 2011

Table 22: central government revenues 2007-10 (current MNT '000)

	2007	2008	2009	2010
Hunting fee	2,688,118	2,883,371	3,954,310	3,142,293
As % of all tax revenues	0.2%	0.3%	0.4%	0.2%

From NSO 2011

Table 23: local government revenues 2007-10 (current MNT '000)

	2007	2008	2009	2010
Fee on usage of timber	1,481,528	1,550,454	1,758,192	1,981,943
Hunting fee	403,790	1,550,454	647,342	555,723
Total forestry-sector taxes	1,885,318	3,100,909	2,405,534	2,537,666
As % of all tax revenues	1.8%	2.1%	1.0%	0.8%

From NSO 2011

Table 24: industrial output sales value 2010-12 (current MNT million)

	2010	2011	2012
Manufacture of wood and wooden products	8,808	11,501	15,661
As % of all manufacturing output	0.9%	0.7%	0.8%
As % of all output	0.2%	0.2%	0.3%

From NSO 2013

Table 25: value of gross industrial output 2010-12 (current MNT million)

	2010	2011	2012
Manufacture of wood and wooden products	9,149	11,868	15,668
As % of all manufacturing output	1.0%	1.1%	1.1%
As % of all output	0.2%	0.2%	0.3%

From NSO 2013

Table 26: production of major commodities 2010-12

	2010	2011	2012
Wooden doors and windows (m ² '000)	13.8	13.6	7.6
Floor planks (m ³)	553.0	1,690.2	1,150.6
Sawn wood (m ³ '000)	20.2	10.6	14.2
Railway sleeper (m ³ '000)	12.5	10.0	12.3

From NSO 2013

Table 27: export of major commodities 2010-12 (current US\$ '000)

	2010	2011	2012
Wood & wood products	412.4	457.9	636.0
As % of all exports	0.01%	0.01%	0.01%

From NSO 2013

Table 28: employment in industry 2011-12 (persons)

	2011	2012
Wood & wood products	1,059	1,266
As % of all employment in manufacturing	4.1%	4.5%
As % of all employment in industry	0.02%	2.05%

From NSO 2013

Table 29: forest carbon 1990-2010 (million metric tonnes)

	1990	2000	2005	2010
Carbon in above-ground biomass	541	505	488	470
Carbon in below-ground biomass	130	121	117	113
Carbon in living biomass	671	626	605	583

From FAO 2010

Table 30: hunting quota 2010 (ha)

Aimag	Roebuck	Wild pig	White-tailed gazelle	Fish	Black grouse	Hazel grouse	Western capercaillie	Partridge
Arkhangai	25	20	-	200	-	-	-	-
Bayan-Olgii	-	-	-	500	-	-	-	-
Bulgan	10	9	-	1,500	-	-	-	-
Darkhan-Uul								
Dornod	-	-	500	-	-	-	-	-
Khentii	40	20	300	200	-	-	-	-
Khovsgol	30	40	-	2,500	-	-	-	-
Orkhon	-	-	-	500	-	-	-	-
Ovorkhangai	-	-	-	150	-	-	-	-
Selenge	80	50	-	5,000	1,000	500	1,000	1,000
Tov	20	30	-	150	-	-	-	-
Ulaanbaatar	-	-	-	100	-	-	-	-
Uvs	11	24	-	500	-	-	-	-
Zavkhan	25	15	25	-	-	-	-	-
TOTAL	241	208	825	11,300	1,000	500	1,000	1,000

From NSO 2010.