



“МОНГОЛ ОРНЫ ОЙН ДОРОЙТОЛ, ХОМСДОЛООС ҮҮДЭЛТЭЙ
ХҮЛЭМЖИЙН ХИЙГ БУУРУУЛАХ БОДЛОГО, АРГА ХЭМЖЭЭ”
ЗӨВЛӨЛДӨХ УУЛЗАЛТ

DISCUSSION WORKSHOP ON
“INITIAL SELECTION AND PRIORITIZATION OF POLICIES AND
MEASURES FOR REDUCING EMISSIONS FROM
DEFORESTATION AND DEGRADATION IN MONGOLIA”

POLICIES AND MEASURES FOR REDD+

UN-REDD Mongolia National Programme

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Contact Information

The UN-REDD Programme / Mongolia
National Programme Management Office / Mongolia
Tel: +976 77117750
Web site: www.reddplus.mn

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List of Acronyms

FRDC	Forest Research and Development Center
FUG	Forest User Groups
GEF	Global Environment Facility
MET	Ministry of Environment and Tourism
MoF	Ministry of Finance
MECS	Ministry of Education, Culture, Science and Sport
MFALI	Ministry of Food, Agriculture and Light Industries
MJEA	Ministry of Justice and Internal affairs
NEMA	National Emergency Management Agency
NFI	National Forest Inventory
PAM	Policy and Measure
PFE	Private Forest Enterprises
PFM	Participatory Forest Management
PLR	Policy, Law and Regulation
REDD+	Reducing Emission from Deforestation and forest Degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks.
SFM	Sustainable Management of Forests
UNFCCC	United Nations Framework Convention on Climate Change UN-REDD United Nations Collaborative Initiative on Reducing Emissions from Deforestation and forest Degradation (REDD) in developing countries.

Executive Summary

Forest in Mongolia can be divided into two distinct forest types, northern boreal forests which cover approximately 13.76 million ha (FRDC, 2016) and the southern Saxaul forests which cover 4.7 million ha (FRDC, 2016), which are an arid zone forest / shrub ecosystem, both these have different ecological conditions, threats and management solutions. Forests in Mongolia contribute significantly towards achieving the countries commitments for sustainable development goals, in terms of jobs and livelihoods, ecosystem service provision, timber and offers potential for revitalization of private sector enterprises through improved sustainable harvesting.

Climate change together with human pressure constitutes a threat for both forest types, with the major drivers of deforestation and degradation comprised of anthropogenic forest fire, unsustainable management and pest damage. Climate change impacts include increased permafrost melting and subsequent impacts on soil moisture levels; possible increase of forest fire and pests attack, change in rainfall patterns which may affect germination and tree growth, though it is also possible that some areas of Mongolia may be beneficial for tree growth.

Deforestation and degradation assessed based on satellite monitoring over the period 1990 to 2014 estimated that deforestation, defined as tree cover being reduced to below 10 % was 32,418 ha or less than 1,500 ha annually, while 85,600 ha annually were affected by various disturbances such as forest fire, pest and logging with the vast majority being due to fire and pest. During the same period another 12,000 ha was added to the forest area mostly grassland converted to forest.

Policies and Measures (PAM) proposed in this report serve to address both climate change mitigation and adaptation. Mongolia will develop a national REDD+ strategy which addresses both traditional mitigation measures and adaptation to build resilience within the forest estate to the impacts of climate change which will be explored in subsequent reports in more detail.

Most emissions from the boreal forest are due to forest fire and to a lesser extent pest damage, both of which are planned to exacerbate with climate change. The risk of forest fire can be exacerbated through pest damage which increases the amount of dead wood matter causing bigger and more deleterious fires. Healthy forest ecosystems can reduce the risk of pests damage and fire. Strengthening implementation of sustainable forest management to make forest more resilient to these impacts is thus a key objective of the Policies and Measures for the National Strategy.

Policies and measures are proposed herewith, which were streamlined from an initial proposed list of 74 proposed PAMs extracted from government policies and selected following a problem tree approach and prioritized through stakeholder consultation. The work has so far focused largely on the forest sector, and thus the proposed Policies and Measures should be expanded upon in the future, and included here is not a final list. Additional PAMs were proposed during the validation workshop and during the final commenting period. These are also included in the report and needs further investigation.

Introduction

One of the key components of the REDD+ readiness process is to identify policy approaches and interventions. These include incentive mechanisms to effectively address key drivers and causes of deforestation and forest degradation (D&D). Such policy approaches and interventions are called REDD+ policies and measures (hereafter referred to as PAMs).

Clear understanding of the current legal, policy and institutional framework, existing and planned activities of the public and private sectors in relation to the key drivers and causes of D&D is required in order to identify PAMs, and an initial analysis has been undertaken. PAMs are set of specific adjustments to be made in the existing framework and actions to be taken on the ground. To ensure long lasting results, these need to be fully aligned with Mongolia's key national development strategies.

In this study, PAMs are to be identified and prioritized, as a set of principles of action adopted by the Government, and specific plans of action in order to implement them. As such, the identification and prioritisation of PAMs is a cornerstone of the national REDD+ strategy.

What is the REDD+

REDD+ (Reducing Emissions from Deforestation and forest Degradation and the role of conservation, sustainable management of forest and enhancement of forest carbon stocks) is a new international mechanism to reward developing countries for reducing their rate of deforestation and forest degradation, and for increasing carbon stocks¹.

As defined under the *1992 United Nations Framework Convention on Climate Change*, REDD+ will operate at the national level and will cover all forested areas in a country. As an interim measure, countries can work on a subnational level. Countries will be rewarded for reducing their forest-related emissions below a set baseline (called a 'forest reference emissions level'), and/or for increasing their removal of greenhouses gases above a set baseline (called a 'forest reference level').

Countries that want to participate in REDD+ are requested to develop the four elements mentioned below.

- A National REDD+ Strategy or Action Plan
- An Assessed Forest Reference Emission Level / Forest Reference Level
- A national forest monitoring system which provides the capacity to measure, report and verify results
- A system for providing information on the application of safeguards or Safeguard Information System

¹ UNFCCC decision on REDD+:

http://unfccc.int/files/land_use_and_climate_change/redd/application/pdf/compilation_redd_decision_booklet_v1.2.pdf

And to address, inter alia, the drivers of deforestation and forest degradation, land tenure issues, forest governance issues, gender considerations and the REDD+ safeguards, ensuring the full and effective participation of relevant stakeholders, inter alia indigenous peoples and local communities.

The work on identifying and prioritizing policies and measures (PAMs) to address the drivers of deforestation and forest degradation as well as possible barriers for enhancing forest carbon stocks is a contribution to this work.

A number of studies have been conducted under the UN-REDD Programme as part of Mongolia readiness efforts towards participating in REDD+. These are:

1. Preliminary Assessment of the Drivers of Forest Change in Mongolia: A Discussion Paper for Supporting Development of Mongolia's National REDD+ Strategy (2016)
2. Using spatial analysis to explore potential for multiple benefits from REDD+ in Mongolia (2016)
3. Entry points and strategic options for mainstreaming financing for sustainable forest management into sectoral budgets (2013)
4. Forest sector financing flows and economic values in Mongolia (2013)
5. Land assessment for AFOLU (LULUCF) sector of the Mongolian GHG inventory using Collect Earth tool (2016)

Forest Area Statistics and Forest Change in Mongolia

There are a number of data on forest area and change in Mongolia, the figures are not always consistent due to different data collection methods, definition of forest cover and interpretation, and often shows quite conflicting results. This report refers to the data that has been collected by Forest Research Development Centre (MET, 2016), and that recently supported through the Multiple Purpose National Forests Inventory (Ref, 2017), data show different results. In addition, an unpublished study by UN-REDD which used Collect Earth tool to assess Land Use, Land Use Change and Forestry (Land assessment for AFOLU (LULUCF) sector of the Mongolian GHG inventory using Collect Earth tool, 2016²) has been used to also look a forest change; the data for National Forest Inventory (NFI) cannot be used for forest change estimation as only measures forests cover at one time point.

Forest Area

Table 1 show forest cover estimates for Mongolia's boreal forests, the saxual forest has been excluded from this table. Data for LULUCF assessment 2016 by UN-REDD and the FRDC's taxation inventory report 2016 show similar results with

² Collect Earth open-source software used for AFOLU sectors activity data creation. A total of 30,889 plots were created for assessment. According to the study result Northern Mongolian forest cover estimated as 13,369.2 thou ha area which also contain logged, burnt and pest affected areas, the forest cover definition used for this study was compatible with NFI forest definition that is minimum of 10 percent crown threshold.

approximate 13 million ha of forest, whereas the Dot-Grid sampling boreal forest cover estimation study done by GIZ shows 9.1 million ha.

Even though the thresholds of forest quantitative parameter (crown cover percentage) s were same for the forest definition, the interest of areas were different. Boreal forest cover assessment by MNFI project using Dot-Grid sampling estimation was done in only well-stocked forest areas (Mongolian Multipurpose National Forest Inventory, 2016) whereas Forest taxation inventory and LULUCF assessment studies both concentrates on well-stocked as well as under stocked forests.

A LULUCF 2016 study that applied Collect Earth tool used 10 percent crown cover as threshold for a hectare forest area. This definition allows forest edges and sparse forest could be accounted as forest area where automated classification systems would generally identify those areas as not forest since majority of the pixels represent grassland. For example, 1 out of 10 pixels would be forest by the definition but, if the probability curve shows that more than 50 percent of them represents grassland then area will be classified as grassland in image processing algorithms.

Table 1. Boreal Forest Cover Estimation

Forest Land Category	Dot-Grid based forest area estimation, ha (UN-REDD)	National Taxation Inventory forest area, ha (FRDC)	Forest mask enclosed Dot-Grid sampling based forest area estimation, ha (GIZ)
Year	2016	2016	2014
Reference	UNREDD (In prep, 2017)	MET (2016)	MET
Natural Forest		9,569,229	9,095,925
Boreal Forest	13,369,217	13,211,700	



Figure 1. Five dots on the upper left corner of the box fall on tree crowns, which qualifies the minimum threshold of forest crown cover definition, 10% in ha area.

Forests Types

The forest consists of two main types, namely the northern boreal forests and the southern saxaul forests. The northern forest type comprises deciduous and coniferous forests growing in the forest steppe, boreal forest and mountain zones, which form an ecological transition between the Siberian Taiga and the Central Asian Steppes.

Boreal forest is dominated by six main conifer species: Siberian larch (*Larix sibirica*), birch (*Betula platyphylla*), Siberian pine (*Pinus sibirica*), Scots pine (*Pinus sylvestris*), aspen (*Populus tremula*) and spruce (*Picea obovata*). The broad-leaved trees found here are mainly birch (*Betula platyphylla*), aspen (*Populus tremula*) or poplar (*Populus diversifolia*).

The southern saxaul forests grow in the southern desert and desert steppe regions, and their trees rarely attain 4m in height (Assessment report on Saxaul forest in Mongolia, 2015), and certainly less than 10% forest canopy cover. They consist mainly of saxaul (*Haloxylon ammodendron*) and of secondary species such as poplar (*Populus sp.*), tamarix (*Tamarix spp.*) and Caragana species. Saxaul forests are important in stabilizing active sand dunes and reducing the effects of sand storms and they also provide fuelwood to local people. The saxaul forests have low above-ground biomass, estimated at 1m³ per hectare (reference), and while protecting these forests are important it will have limited effect in terms of emission reduction results.

Most work on REDD+ in Mongolia has therefore focused on forest change in the northern boreal forests. It should however, be noted that degradation and deforestation are significant problems in the Saxaul forests and the area of arid land has increased (FAO 2009). Given the change of emphasis of REDD+ in Mongolia from purely emissions based at the start of the program, now to focus on the wider aspects of buildup climate change resilience, the saxaul forests should now also be included.

Forest Governance

All forests in Mongolia are state property. The Ministry of Environment and Tourism (MET) has primary oversight for forest development and conservation, while Aimag and Soum administrations are responsible for forest management at the local level.

Administratively, Mongolia's forests are divided into two categories: Protected and Utilization Zones. The Protected area (79.5% of total)³ includes sub-alpine forests, special protected areas, national parks, nature reserves and cultural monuments, around water bodies, cities, towns, roads and railways, and have controlled commercial logging (thinning and cleaning operations) and harvesting for subsistence needs. In the Utilization Zone (20.5 %), commercial logging is permitted, under strict Government control.

The Law on Forest 2012 revised in 2015 allows contracting management and user rights to Private Forest Enterprises (PFE) and community Forest User Groups (FUG). By September 2016, 1218 FUGs have been established that manage approximately 3,1 million ha and 90 PFEs manage approximately 600 000 ha. The aim is to increase this to 4 million ha by 2020 (MET 2016).

Forest Change

Mongolia has three set of forest data, which have different purposes and have been collected using different methods and therefore providing different numbers as explained above. The forest taxation data provides data on an annual basic for each Aimag and classifies forest into closed and open forest, which is dependent upon the Relative Stocking Density. Data using one approach show that boreal forest area has decreased with approximately 47,000 ha (0.43%) of 'closed' boreal forest being deforested every year between 2004 and 2014 (FRDC, 2014). In addition, approximately 103,000 ha of closed forest is degraded and reclassified during taxation surveys as 'open forest' (FRDC, 2014).

The Collect Earth Assessment (2016) is based on interpretation of satellite images and over the period 1990 to 2014. One strength of this approach is the tracking of land over a longer period which can give better date for forest area change. Deforestation, defined as tree cover being reduced to below 10 % was 32,418 ha during the period 1990 to 2014 or less than 1,500 ha annually, while 85,600 ha annually was affected by various disturbances such as forest fire, pest and logging with the vast majority being due to fire and pest. During the same period another 12,000 ha was added to the forest area mostly grassland converted to forest.

A National Forest Inventory covering the boreal forest has been completed in late 2016. This approached based on sample points provides data on forest cover and characteristics of the forrest ecosystems such as tree species distribution, sizes, carbon stocks etc. This information is particular relevant for forest policy development and can be used for assessing mitigation efforts such as the Intended

³ Note that the NFI have a different assessment for the boreal forest area with 31% in protected areas, 17% designated for production and allocated to Forest User Groups(FUG), 4% for production and allocated to forest concessions and 48% undesignated.

Nationally Determined Contribution submitted to the UNFCCC in 2015⁴. This information is however not providing information at the stand level where forest interventions would take place.

Definition of forest⁵ – Areas of the land where canopy cover is greater than 10% or has the potential to be, tree height is greater than 2m or has the potential to be, and the minimum area considered to be forest is 1.0 ha (Additionally the minimum width is 20m), (NMFI).

Definition of deforestation⁶ – Areas of forest where the tree canopy cover has been reduced to below 10% and if it still at same condition after 20 years then that would be deforestation. And the predominant land use is no longer forest production.

Definition of forest degradation: a direct human-induced loss of forest values (particularly carbon), likely to be characterized by a reduction of tree crown cover. Routine management from which crown cover will recover within the normal cycle of forest management operations is not included (IPCC 2003, ITTO 2005).

Definition of sustainable forest management⁷: “A globally agreed definition of sustainable forest management (SFM) is impractical beyond a very general level because of the huge diversity of forest types, conditions and socioeconomic contexts worldwide. In general, however, SFM can be viewed as the sustainable use and conservation of forests with the aim of maintaining and enhancing multiple forest values through human interventions. People are at the centre of SFM because it aims to contribute to society’s diverse needs in perpetuity.”

According to the Collect Earth Assessment⁸ there was a deforestation of 32,418 ha during the period 1990 to 2014 corresponding to 1,350 ha annually and afforestation on 12,156 ha during the same period (UN-REDD draft report on Land assessment for AFOLU (LULUCF) sector of the Mongolian GHG inventory using Collect Earth, 2016). This is significantly less than the 47,000 ha deforestation (FRDC 2014). The explanation is due to different methods for determining deforestation. The approach that provides a high annual deforestation area is based on the accumulation of reported annual deforestation in each Aimag. In this case, a destructive forest fire that results in a loss of forest cover will be recorded as deforestation. The same area could however, after a number of years regenerate. Using the Collect Earth comparing 1990 and 2014 a lot of areas could have been cleared and regenerated again during this 24 year period and they will not show up as deforestation when comparing only 1990

⁴ Mongolia intend to reduce emissions from deforestation and forest degradation by 2% by 2020 and by 5% by 2030.

⁵ This definition has been approved by the Science and Technology Committee during the approval of the NFI methodology. It is not however consistent with the current definition of forest as defined by Law and used by FRDC within the forest taxation inventory.

⁶ Note if forest cover falls below 10% and the intent⁷ is for the land to be reforested this will be defined as forest still – in accordance with two different land classifications – land cover and land use. This distinction is important to recognize since IPCC GHGI reporting uses land use, whereas most satellite earth observation techniques can only identify land cover. This issue arises in the situation where tree cover falls below the threshold; the land cover changes but the land use may remain the same – ie forest in this case.

⁷ Food and Agriculture Organization of the United Nations (FAO):

<http://www.fao.org/forestry/sfm/85084/en/United>

⁸ Using a forest definition with minimum crown cover of 10% and minimum size of 1 ha (TWG meeting report on Reviewing forest reference level decisions, 18th Nov 2016).

with 2014 but they could be registered as deforestation followed by reforestation using annual assessments.

For the classification of land, the normal practice would be to record forest land that loss their forest covers temporary as temporary unstocked forest land and not as deforestation followed by reforestation. What is considered temporary is a national decision and need to take into account national conditions but if the area is converted into other land use e.g. settlements or agriculture then it is deforestation (Iversen et al. 2014).

Problem Context

Mongolia has very limited deforestation according to data from Collect Earth Assessment. There are significant areas however, that loss the tree-cover due to forest fire, logging, pest infestation etc. According to the recently completed NFI there was 2.8 million ha of forest land with a tree cover below the threshold required to be defined as forest. 1,7 million ha of this area was due to forest fire, which illustrate the significant impact forest fires have on the forest. It is however not possible to conclude from one observation whether this will be permanently unstocked and thus classify for deforestation or even whether this can be considered as degradation. If the area with temporary unstocked forest is increasing over time then it can be classified as forest degradation. There is a need for monitoring continuously before this can be determined.

The temporary unstocked area can however be reduced e.g. by preventing forest fire or by regenerating the areas more actively. And this would be a REDD+ result as an enhancement of forest carbon stocks that remove CO₂ from the atmosphere. The NFI data shows that the forest is characterized by single species stands, contains a lot of dead wood, has many old trees and generally lack younger age classes and thus are over-mature from a forestry perspective. Also according to the NFI there is a significant potential to increase carbon stocks by promoting forest management that rejuvenate the forests and increase the annual growth rate.

This ambition to improve forest health and reduce the impact of forests fires could however, be challenged by climate change that threaten to exacerbates the frequency and scale of forest fire, pest outbreaks and diseases (Flanningan et al., 2008). Kurz et al., (2008) conclude based on a study of Canadian forest that boreal forest C stocks may decline as a result of climate change because it would be difficult for enhanced growth to offset C losses resulting from anticipated increases in disturbances.

Many climate models predict a loss of carbon in southern boreal forest with global warming accompanied by increased mortality agents such as drought, fire and insects as well as a drying of the soil that challenge the ability for species to regenerate naturally (Koven, C. D., 2013).

In another study Kurz et al. (2013) conclude that the single biggest threat to C stocks in Canadian boreal forests is human-caused climate change. Large C stocks have accumulated in the boreal because decomposition is limited by cold temperatures and often anoxic environments. Increases in temperatures and disturbance rates could result in a large net C source during the remainder of this century and beyond. While this study is for Canada it is most likely also relevant for boreal forests in Mongolia.

There is, therefore a need for adaptive management for boreal forests to keep healthy forest ecosystems with a high degree of resilience characterized by the ability to withstand and recover from disturbances events.

As such an important objective of the proposed PAMs is to strengthen the resilience of the forest ecosystems to the effects of climate change. This fits well with recommendations from the Multipurpose National Forest Inventory for national forest policy implementation produced by the NFI project (Horst, A., 2016. in prep.).

Based on data collected during the NFI project implementation the Mongolian forests are characterised as:

- Mongolian boreal forests are under-utilised
- Mongolian boreal forests are understocked
- Mongolian boreal production forests are over-mature and lack young age classes
- Mongolian boreal forests contain a lot of deadwood
- Mongolian boreal forests are dominated by a single species
- Health of the Mongolian boreal forests is mostly impacted by snow/ice damage and forest fires
- Mongolian boreal forests have restoration potentials
- Mongolian boreal forests constitute a carbon pool which has not reached saturation

Based on these observations the report identifies the five most important policy recommendations:

1. Policy and legal framework for sustainable forest management has to be improved and most importantly, be implemented (through a strategy and action plan until 2020 and 2030)
2. Potential of the forest sector has to be realized by implementing sustainable forest management
3. Governance and institutional setting of the forest sector has to be improved (by creating a financially autonomous state forest agency)
4. Sustainable financing for the forest sector is urgently needed
5. Mitigation of climate change requires active and climate-smart forest management

Drivers and barriers

Drivers for deforestation and forest degradation in Mongolia has been identified to include:

- Unsustainable harvesting practices
- Forest fire
- Forest pest

Barriers for tree planting has been identified to include:

- Poor practices including poor genetic material
- Lack of protection combined with heavy grassing pressure

Different from most countries engaged in REDD+ Mongolia do not have agriculture expansion into forest areas as a significant driver of forest area change (UN-REDD, 2016).

Legal and illegal utilization of forests

Underlying drivers for unsustainable management has been identified as both a problem with forest law enforcement related to insufficient capacity at Soum and Aimag level to effectively enforce and protect the forest resources and as problem with the supply of timber and other wood products that don't fulfill the domestic demands. PAMs investigated could address the problem by increasing the effectiveness of forest law enforcement and/or by increasing the harvesting volumes to meet the demand and thus reduce the demand for illegally harvested wood.

At the same time "legal" harvesting levels are low also in a historic perspective and this not only hamper the development of healthy wood based industries but also add pressure for the illegal harvesting.

An increase in harvesting volumes should be seen in context of the forest resource. The new multi-purpose NFI provides information on forest resources, the appropriateness of the current harvesting levels as well as on forest health. Information presented so far shows that harvesting levels could increase significantly without compromising the forest resource and in fact be beneficial for maintaining healthy forest ecosystems.

Forest fire, pest and diseases

Forest fire, pest and diseases are all natural phenomena in the boreal forests and helping to promote diverse forest ecosystems but also able to cause significant emissions. It is possible to some extent to prevent forest fires and pest outbreaks by keeping the forest healthy and resilient, but it is not possible to avoid these events completely and probably also not desirable taking into account the diversity and rejuvenation of the forests they are promoting.

Climate change is predicted to exacerbate the frequency and severity of forest fire, pest and diseases in the boreal forest, something which is also reported from boreal forest in Canada and Russia. This means that even without human activities boreal forest are under pressure and management efforts should aim to strengthen resilience and as well as mitigation efforts in general.

Forest management measures can create healthy and resilient forests that are less susceptible to forest fire, pest and diseases (Kjapwijk et al. 2016). Forest management should be the first priority since this is a long-term measure to address the risk of forest fire, pest and diseases while direct control measures are the second priority since this is only a short-term solution. Efforts to control fire and pest outbreaks should also take into account the cost of implementing a control measure compared to the expected loss caused by the forest fire or the pest outbreak.

As an example Zamolodchikov et al. (2011) report on how the Russian Federation has applied different management regime for controlling forest fires in the eastern and western part of the country, basically only controlling forest fire in the east when infrastructure or settlements were threatened. Canada has applied similar considerations in their management practices

Forest fires and pest outbreaks are interlinked. Not all forest fires are destructive and there will often be both dead and weak trees left after the fire. Many forest pest and diseases have a greater effect on already weak trees that provide a medium for a boost in the population and thus a first step towards a major pest outbreak. Pest and diseases on the other hand, can also kill trees and provide fuelwood for a forest fire to consume and thus allow it to grow and become a major problem. Standing dead trees is a particular problem as it can bring a less harmful ground fire to a more destructive crown fire.

The study on drivers of forest change quantifies emissions from forest fires but not emissions from pest outbreaks (UNREDD, 2016). While burning biomass will cause immediate emission the situation is different with pest outbreaks. Dead and weakened trees have less increment and thus remove less CO₂ from the atmosphere but they only emit the stored CO₂ slowly as the wood decay.

PAMs identified and prioritized to prevent forest fires and pest outbreaks are both addressing the human activities causing forest fires and the means to address them and more importantly building resilience in the forest ecosystem itself, which will be both cheaper and have a more long-term effect including in the context of climate change.

Tree planting

The barriers for successful tree planting was reported to be significant in terms of tree plantings having a very low survival rate but at the same time estimated as a barrier that has less importance in terms of climate mitigation. This is partly due to the long-term nature of these programs where results in terms of climate mitigation take many years.

The underlying drivers for the poor results are expected to be both related to difficult natural conditions, poor planting material, plants in poor condition, inappropriate site selection and preparation and insufficient protection of the plants after planting especially from grazing animals. At the same time, it is clear that the effect of climate change together with a loss of the forest microclimate after a clearing in some case, in particular on slopes facing south, will dry out the soil and make it be very difficult if not impossible to reforest. In such cases, the most appropriate measure is probably both to avoid such a situation to happen in the first place by managing the forest accordingly, and if it does happen be realistic and use the resources for forest plantings on areas with a higher likelihood of success.



Picture 1. Southern slope after loss of tree cover will be very difficult to bring back to forests.

PAMs in this context are both to improve the adaptive ability of plant material, the technique used, forest management practices, site selection and preparation and the incentive to ensure a high plant survival. This is an approach used in many countries where an incentive for high survival rates provides an impetus for the contractor to improve on all the mentioned factors.

Mining

Mining was the also considered to be of minor importance in terms of mitigating the loss of forest carbon stocks especially after the Mining Law (the law with the long name) confined the destruction caused by illegal mining. Illegal mining is expected to be limited to very valuable minerals such as gold and thus limited to one Aimag.

PAMs in this context could be improved law enforcement. Methodology and Selection Criteria Used

Literature Review

The proposed PAMs in this reports build on the information provided in earlier reports in particular the report: Preliminary Assessment of the Drivers of Forest Change in Mongolia: A Discussion Paper for Supporting Development of Mongolia's National REDD+ Strategy (2016).

In addition to a number of scientific articles on Mongolian forests, the Team has used information from other countries with boreal forests namely, Russia, Canada and USA as they also face the challenges of climate change and how it's impacting the forest ecosystems.

All of these countries have to deal with increased number of pest outbreaks as pest and diseases with changing temperatures expand into new territories and affect forest in unprecedented ways. This is followed by forest fires, which is expected to increase in numbers and severity. Common for these countries the focus on forest management is highlighted as the best solution to these challenges.

Consultation and Expert Reviews

Consultation with government ministries and agencies relevant for managing forests in Mongolia as well as private stakeholders (representatives from Forest User Groups (FUGs) and Private Forest enterprises (PFE)) and development partners such as GIZ and FAO have been undertaken to inform the work.

This includes workshops on forest fire and pest management, as well as a larger consultation workshop to prioritize among candidate PAMs.

Prioritization through scoring

After initial data collection a number of candidate policies and measures to address the identified drivers of deforestation and forest degradation were developed. This followed a methodology where each of the main drivers identified in the Assessment of the Drivers of Forest Change in Mongolia was analyzed to identify the respective underlying drivers.

This work was presented in the format of problem trees (see annex 3) and candidate PAMs were then identified. These PAMs were partly identified based on information presented in various reports but more importantly through interviews with stakeholders in Mongolia (see annex 1 for a list of meetings and workshops).

A two-day workshop to discuss and prioritized among the candidate PAMs was held 22-23 September with 54 participants mainly representing stakeholders from within the forest sector. Figure 2 below illustrates the workflow and annex 4 illustrates the methodology used and how the calculation of final score was made.

Three criteria for prioritizing the PAMs were presented: climate mitigation short term <10 years, climate mitigation long term >20 years and co-benefits. Co-benefits covered everything that could be considered a benefit and did not fall under climate change mitigation.

Participants were divided into five groups and asked to weight the three criteria in terms of their importance. The result of this weighting was a clear priority for the co-benefits, which with the very broad definition also could seem more relevant for most participants.

A scoring of each PAM was then done using a scale from 1 (low) to 5 (high) for each PAM against the three criteria. The participants should make a guestimate of how they expect the PAM to perform against each of the three selection criteria. This is obviously very difficult with the limited information available and the idea was also only to provide an initial idea of how stakeholders viewed the different PAMs. The average scoring of all participants was then multiplied by the assigned weight for each criterion and then added together to provide one score for each PAM.

Finally, participants were asked to assess the feasibility of each PAM under the three headings: practical, financial and political feasibility.

The result of this work showed limited variation in scoring partly due to the fact that many participants only used the high scores 4 and 5 and not the full range down to 1 and 2. However, the results were still useful for the further work that included more focused stakeholder interviews mainly carried out by the UN-REDD Programme management unit. A workshop report with all the results was produced.

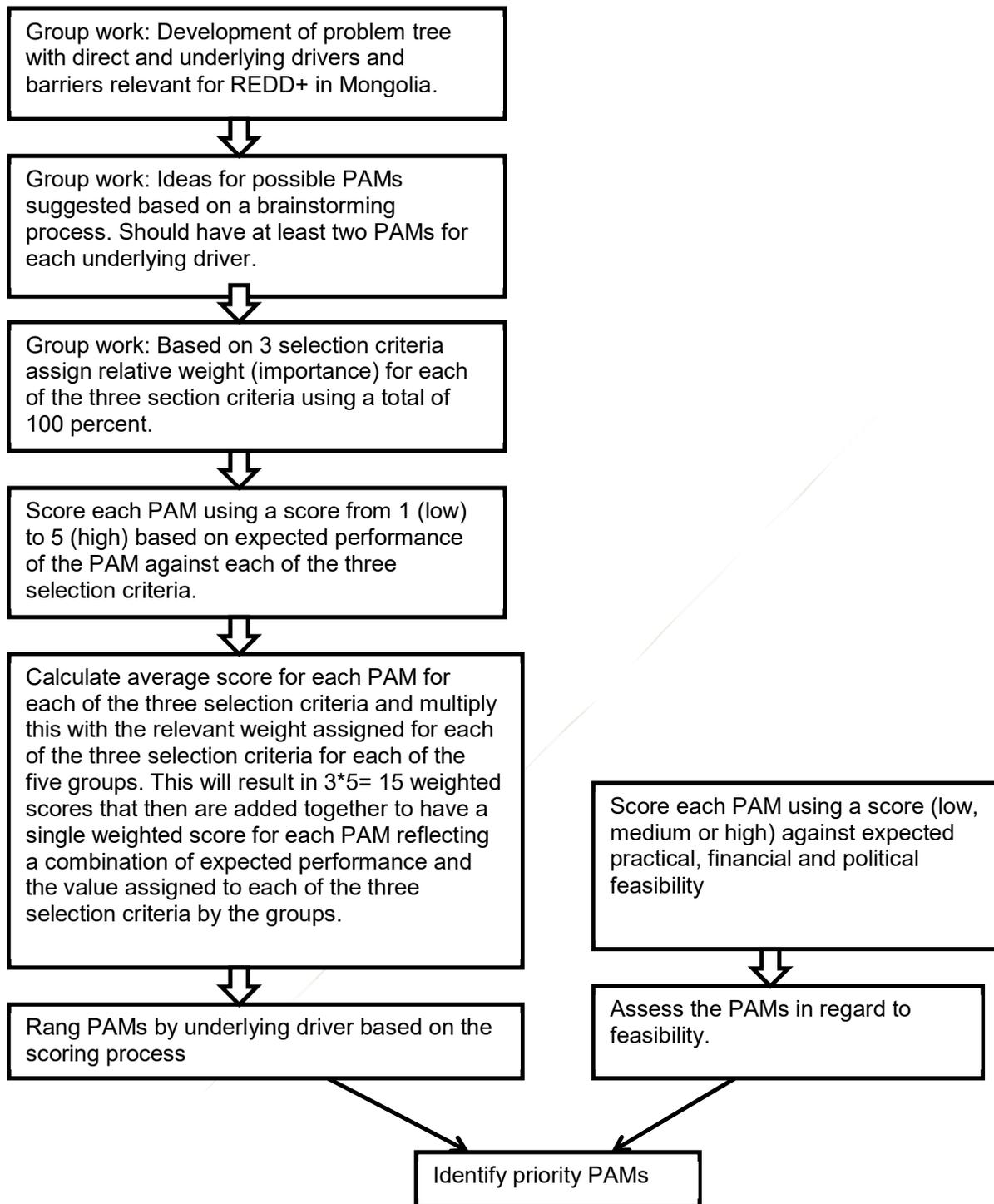


Figure 1. Workflow for the identification and prioritization process

Policies, Laws and Regulations

A rapid analysis of relevant policies, law and regulations were carried out focusing on identifying strength and weaknesses of PLR that directly relate to the identified drivers (see annex 2 for a complete list of PLRs analysed).

Some main weaknesses identified from this work:

1. PLRs concerning FUGs and their use of forests lack clarity and make it difficult to engage FUG effectively in forest management.
2. Forest Law enforcement in protection forests are not effectively implemented due to limited staff.
3. State Forest Policy is not funded and thus not implemented as intended. This also includes developing a State Forest Management plan, which is lacking at the moment.
4. Lack of funding for forest activities is partly due to the fact that the 85% of the forest revenue that should be spent on forest activities are not used for forest activities.
5. The law to prevent the export of raw timber has a positive effect on the prevention of illegal logging and subsequent export but it also hampers the export of quality wood products.
6. Lack of a legal framework to restrict hay making and grazing in forests.
7. Initiatives to plant trees are in some cases delivering poor results.
8. Funding for pest control according to the law is lacking.
9. Limited rights to implement forest management plan in PFE's concession area.

In conclusion, the PLR analysis is in line with some earlier analysis that also concludes that Mongolia has good PLRs but in some cases, they lack implementation. This analysis points in particular to the lack of funding as the main obstacle for the effective implementation. In a few cases, such as for incentivizing FUG it seems to be directly related to a lack of clarity in the PLR framework that creates difficulties. Likewise, a lack of regulation of grazing pressure causes problems for the survival rate of tree plantings.

Candidate PAMs Proposed as Priority PAMs

Table 2 below present candidate PAMs that was prioritized during the process. Note that some PAMs address more than one problem/driver. This is particular true for improved forest management. This PAM can be considered an overarching PAM that address multiple drivers at the same time.

Improved forest management aim to improve forest diversity and health and thus make forest less vulnerable to pest outbreak and subsequent forest fire. Forests with mixed species and different age classes are more resilient to both pest and forests fire (Kjapwijk et al. 2016). While this will take place in the areas designated for production forests, it will also help to fulfil the demand of wood and wood products and thus reduce pressue on all forest in Mongolia. At the same time it will provide more jobs in forest management as well as the downstream forest industry and this generate income as well as revenue to the government.

Table 2. Candidate PAMs, Key activities and key responsible institution.

PAM	Key activities	Key responsible institution
Strengthen the forest sector and improve forest management		
Improve the effectiveness and engagement of FUG in Participatory Forest Management (PFM)	1) Clarify the legislative framework to allow thinning activities and 2) provide training to FUG members. Limit forest management (thinning) rights to FUGs with at least one member trained in thinning of forest stands.	MET
Improve forest management and income generation by private sector enterprises (PFE)	1) Assess the appropriateness of the annual allowable harvest based on data from the recently completed NFI including the area under active management. 2) Change the method of allocating the allowable harvest to PFE based on sustainable management principles following 10 years management plans. 3) Implement a program for developing forest management plans. This will include: a) developing a prototype management plan that is appropriate for the management of Mongolian forest. This sould include not only information on harvesting but also regeneration of forest. b) decide on how management plans should be developed e.g. through contracting a private company or by forestry unit staff. c) develop a budget and a target for the implementation of this activity.	MET
Forest fire		
Prevention by raising awareness	Raise the level of awareness by a campaign for the general public using different media outlets.	MET and NEMA
Provide training and sufficient firefighting equipment	Train Soums Forestry Units and selected community's trainers in efforts to control forest fires and ensure they have sufficient firefighting equipment.	MET and NEMA

Improve forest fire control by improving information sharing	Use remote sensing to detect forest fires and establish a system to disseminate information to relevant authorities including affected Soums and local communities.	MET and NEMA
Reduce the risk that forest fires expand beyond control	Reduce the abundance of dead wood through a more active forest management involving FUGs, PFE and Soums Forestry Units.	MET and MFALI
Improve the capacity to deal with forest fire through international collaboration	Collaborate with neighboring countries to deal with cross-border forest fires.	MET and NEMA
Forest pest		
Increase resilience	Promote sustainable forest management and increase the annual harvesting level and thus reduce the area with over-mature stands in production forests.	MET and MFALI
Improve decision-making process on control measures	Develop an efficient decision making process for how to deal with pest outbreak based on agreed thresholds for when and which efforts will be undertaken including consideration of the financial implications.	MET and FRDC
Build national capacity through international collaboration	Build further national capacity to deal with forests pest and diseases through international collaboration.	MET and FRDC
Improve national capacity to control pest outbreak	Investigate the feasibility of a national production of substance to control pest outbreaks.	MET and FRDC
Tree planting		
Improve the use of appropriate genetic material for plantings	Identify suitable forest stands for collection of seed and protect these stands for future use. This should be according to the different ecological zones and with consideration of the impact of climate change.	MET
Improve plant quality	Provide training and certification to commercial nurseries.	MET and FRDC
Incentivize high success rate of plantings	Split payments into two. One for the time of establishment of the plantings and one when the plants on average have reached an agreed height with a minimum number of plants per ha.	MET
Improve regeneration practices	Train PFE in good forest management practices that will facilitate natural regeneration after harvesting. This can include supplementary plantings to increase species diversity.	MET and FRDC
Enabling PAMs		
National Forest Inventory as part of the National Forest Monitoring System	Implementation of continued NFI following recommendations made by the first completed NFI.	MET
Increase staff level at local level in order to enable them to supervise and enforce	1) Nominate adequate staff numbers for each forestry unit to make it possible to supervise FUG and PFE operations and strengthen forest law enforcement, 2) allocate funding and do the recruitment, 3) provide training of local forestry units in forest management planning	MET

Improve inter-ministerial policy coordination	Establish an inter-ministerial policy coordination body representing the relevant stakeholders.	MET
Awareness raising	1) Teach students at secondary school of the importance of forests and climate change. 2) Supervise and train FUG and PFE. 3) Facilitate certification of sustainable forest management.	MET and FRDC
Roads	Re-establish forest roads as well as new forest roads to improve access for forest management and other management activities.	MET
Fulfilling household energy requirements	Establish a programme to deliver affordable and sustainable fuelwood to households.	MET and MFALI

Improve the effectiveness and engagement of FUG in Participatory Forest Management (PFM)

There are 1218 Forest User Groups (FUG) that protect approximately 3,1 million ha of forest (MET, 2016). Despite some initial success (Gilmour D., 2012), many FUGs are not benefitting from the forest areas they have been allocated and not engaged in the protection of the forest area. A GEF funded project implemented by FAO is aiming to develop the capacity and operationalize 84 FUGs that are currently not active. (FAO project document, 2014). According to the project document forests in FUG areas are under-harvested meaning revenue is lost, forests are not managed, and the potential for fire, insect, disease and illegal harvesting is high. In addition, FUG's have the responsibility to protect forests from illegal logging and forest fire.

Involving FUGs in pre-commercial thinning of dense stands will improve stand health, promote the growth of the remaining trees and reduce the risk of pest, disease and fire as well as provide light to the forest floor and promote a richer biodiversity with the potential to deliver more non-timber forest products.



Picture 2. Dense stand of Larix that would benefit from thinning.

One of the key problems is the lack of incentives for FUG to carry out SFM, a problem that follows from a lack of legislative clarity concerning the rights and obligations of FUGs. As it stands now FUG benefits from improving and restoring forest is limited to the right to collect dead wood on the forest floor and various non-timber forest products. These activities generate limited income and are not a sufficient compensation for the protection of the forest area. In fact, the GEF/FAO project concludes that current levels of incentives are significantly below the level required and threaten to undermine the whole FUG strategy.

FUGs opportunities could be expanded by allowing them to do pre-commercial thinning and remove standing dead trees. This will require training and guidance in order to ensure that the future regeneration is not hampered. A publication with guidelines for forest management for FUG has been developed (Sved, 2011) and training is already being provided by FAO.

During the consultations participants have raised concern regarding the technical capacity of FUGs to participate in forest management. However, this is being addressed e.g. by the GEF/FAO project that provides training of FUGs in close collaboration with Soum Forestry Units in thinning of dense stands that are the result of successful forest regeneration. For FUGs involvement in forest management such as thinning it could be a pre-condition that at least one FUG member has successfully completed training. Provision of training is an integrated part of this PAM.

Another issue is the lack of legal recognition of FUG. FUG does not have the possibility to be registered as a legal entity which makes it more difficult to develop business models and generate income from their activities.

The PAM to improve the effectiveness and engagement of FUG in Participatory Forest Management is thus to support the on-going efforts, clarify the legislative framework to allow thinning activities and provide training to FUG members. This includes also ensuring that fees for FUGs to use the forests reflect the actual benefits generated and the protection services provided by the FUG activities. Moving forward there will be a need for support from Soum Forestry Units to develop forest management plans and subsequent supervision. Additional activities to support FUG develop income-generating activities e.g. selling forest products could also be developed. This PAM thus has the potential to improve management of more than 3 million ha and more if the area protected by FUG is further expanded.

REDD+ outcomes

PAM: Improve the effectiveness and engagement of FUG in Participatory Forest Management	
Core objective	Strengthen forest ecosystem resilience and incentivizing FUGs to engage in forest protection and SFM and thereby reduce emissions and enhance removals.
Co-benefit	Support for rural development Improve the future production of timber Enhance local production of smaller size wood and fuelwood Improve biodiversity in areas after thinning. Adapt to climate change by building more resilient and mixed healthy forest stands.
Area covered	3.1 million ha forest
People and institutions involved	1218 FUGs, Soum Forestry Units, MET.
Strength	Building on an existing GEF/FAO project involving 86 FUGs – 16 FUGs are already advanced
Risk	Forest areas protected by FUG might not all have a good potential.

Improve forest management and income generation by Private Sector Enterprises (PFE)

This PAM is the only PAM that can ensure that old and over-mature stands will be harvested and thus improve forest health and increase the ability of forest ecosystems to cope with the effects of climate change.

According to DFPC there are 90 PFE managing an area of 600.000 ha (MET, 2016). This falls short of national targets for timber production and short of officially planned requirements to support Mongolia's wood industry and its emerging needs.

In addition to the 90 PFE licensed to harvest timber in production forests, at least as many businesses are registered in boreal forest Aimags, 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 that provide important local

job opportunities.

Despite the on-going degradation of the forest resources in some areas, the recently completed national forest inventory (NFI) suggests that harvesting could increase. With the national forest inventory (NFI) there is an opportunity to reassess the scale and approach for allocation.

Representatives from Private Forest Companies highlighted the uncertainty for the long term access to timber as the most important constraint for development of the forest sector and highlighted the process of allocating the annual allowable cut as the main cause for this constraint.

The allocation of annual allowable cut follows a cumbersome process that has two negative consequences for the development of a healthy forest sector and thus the generation of the much-needed jobs and income at both local and national level.

The first problem is related to the time to do the actual harvesting is very limited which require companies to have an expensive excess capacity in order to harvest the annual allowable timber within just a few months.

The second problem is the annual nature of the allowable harvest. Companies need assurance that there will be sufficient timber available in the following years before they can make investments, borrow money and develop their businesses. Allocation one year at the time does not provide such assurance.

For the long-term perspective, there will also be a need to consider demand. If harvesting levels are increased by 100-200% there need also to be a demand. Export is one option but also national consumption could be enhanced including through the construction of houses or other wood sector enterprises. This is not only climate friendly but can also be economically competitive and Mongolia could learn from countries such as Sweden and Finland that have a strong tradition for building wooden houses.

The situation today is that lack of investment negatively affects the development of a strong wood-based sector with the consequence that the production is smaller than it should be and thus add pressure on illegal logging. A stagnant sector will also have difficulties in attracting qualified staff. which will impact the capacity for implementing SFM principles.

While the NFI provides national data on forest resources this is not sufficient for allocation of allowable cuts for individual forest concessions and there is a need for more detailed information which can be provided through forest management plans. A forest management will not only provide direction for specific forest interventions but will also function as a tool for communication and supervision between private forest companies and the relevant authorities.

This PAM will do four things:

- 1) assess the appropriateness of the annual allowable harvest based on data from the recently completed NFI.

- 2) change the method of allocating the allowable harvest to PFE based on sustainable management principles following 10-year management plans that will provide assurance to companies while also provide periodical supervision of the harvesting and forest management. Management plans need to take into account the need for securing a healthy regeneration and development of the forest stands.
- 3) develop a prototype forest management plan with the aim to eventually have forest management plans for all of the areas under active management. This plan will not only include information on harvesting levels but also on regeneration and restoration activities to be carried. Using modern technologies this will allow for relative easy updates after the first 10-year period. Depending on the required level of details the costs of developing forest management plans for the first time could be 4 USD/ha⁹. The updates 10 years latter will only cost a fraction of this as much information can simply be updated based on yield tables.
- 4) develop budget and decide how these plans should be developed e.g. by a contracted private company or Soum and Aimag Forestry Units¹⁰.

REDD+ outcomes

PAM: Improve forest management and income generation by private sector enterprises (PFE)	
Core objective	Strengthen sustainable forest management and thus forest ecosystem resilience and thereby reduce emissions and enhance removals.
Co-benefit	Support for rural development. Enhance the production of timber and wood products. Strengthen the forest sector, make it possible to enter long-term contracts, borrow money and make investments. Provide jobs and income and government revenue. Improve biodiversity protection by promoting healthy forest stands.
Area covered	600.000 million ha forest – this should increase as the private forest sector develops.
People and institutions involved	PFEs, MET, local forestry administration
Strength	The NFI now provide a better background for harvest allocation. A project on development of forest management plans have already been implemented and can be useful for this PAM. An on-going project to help certify forest management after international standards will help to ensure that management following SFM principles.
Risk	Funding for developing forest management plans is not available. Illegal timber is providing unfair competition and needs to be reduced. Domestic demand for legal wood products is not sufficient. PFE capacity and knowledge of SFM is low.

⁹ Costs for making a management plans for tropical forests have been around 6 USD/ha and with the fewer species and less dense boreal forests it should be cheaper for boreal forests.

¹⁰ Forest management plans are relevant both for PFE and FUGs.

Forest fire

Forest fire is a characteristic feature of boreal forest ecosystems and promotes stand regeneration and biodiversity and many boreal tree species have a life cycle that benefit from these disturbance events. At the same time forest fire has the ability to inflict damage to infrastructure, settlement and in some cases endanger human lives. Forest fire can also inflict significant costs through the loss of forest resources that otherwise could have been used for wood products.

Forest fire is most likely the single largest source of emissions from forests in Mongolia and creates large inter-annual variation in emissions. Forest fire emissions have a high dependency on the weather, in particular, how dry and hot it is during the fire season and climate change is expected to increase fire activity (Flannigan et al. 2008).

While it is not possible to control the annual weather, it is possible to reduce the risk that forest fires occur in the first place – by fire prevention methods through improved silviculture. It is also possible to reduce the risk that forest fire becomes very large – by reducing the fuel load through forest management practices and by early fire control measures before the forest fire develop to a large forest fire. It is however, neither possible nor desirable to totally eliminate forest fires in boreal forests. One of the findings from an ADB funded project under NEMA was that Aimags posed very limited firefighting equipment (Jeffery Weber per.com. 2016).

PAMs proposed contain a list of activities to prevent and reduce forest fire emissions.

Prevention by awareness raising

To raise the level of awareness a campaign for the general public using different media outlets should be initiated.

Provide training and sufficient firefighting equipment

Soums Forestry Units and selected communities should be trained as trainers in efforts to control forest fires and they should be equipped with sufficient firefighting equipment. This can include developing firebreaks including through prescribed fires in land along forest edges. A project implemented by NEMA together with ADB is already working on this.

Improve forest fire control by improving information sharing

To enable rapid action to control forest fires an improved system for using remote sensing to detect forest fires should be implemented that includes a system to disseminate information to relevant authorities including affected Soums and local communities when a forest fire is detected.

Reduce the risk that forest fires expand beyond control

Reduce the abundance of dead wood through a more active forest management mentioned above involving FUGs, PFE and Soums Forestry Units should be implemented. This will lead to healthier and more productive forests with less dead wood and thus forests that are less susceptible to forest fires.

Improve the capacity to deal with forest fire through international collaboration

Collaboration with neighboring countries to deal with cross-border forest fires should continue as well as possible collaboration on how to control fires close to the border.

REDD+ outcomes

Core objective	Strengthen the capacity to prevent and reduce forest fire emissions. Reduce the loss of carbon and forest degradation due to forest fire.
Co-benefit	Reduce the loss of forest resources and possible negative consequences for settlements and infrastructure. Adaptation through the implementation of sustainable forest management practices.
Area covered	In order to be cost-effective it is necessary to prioritize where and when to control forest fires. Forest fires close to human settlements, infrastructure and production forest with valuable timber should have higher priority.
People and institutions involved	Local communities, local forestry administration, MET, National Emergency Management Agency, Information and Research Institute for Meteorology, Hydrology and Environment, National Coordination Committee on Forest and Steppe Fire Protection, Fire Management Resource Center - Central Asia Region (FMRC-CAR) and the National Security Council.
Strength	Mongolia has already a lot of experience with combatting forest fires and access to new technologies to improve the detection and thus rapid control of forest fires.
Risk	Not sufficient funding available to purchase firefighting equipment and conducting training at local level. Inter-agency coordination and sharing of information is not working. Climate change is predicted to increase the risk of forest fire.

Forest pest and diseases

Forest pest and diseases are normally not considered a major source of emissions. Pest outbreaks have a negative effect on tree health, reduces the increment and thus the removals but it does not cause a lot of emissions. It can however, increase the fuel

load and make forest fires worse and harder to control and therefore indirectly have an effect on emissions.

As with forest fire pest and diseases are also a natural component of the forest ecosystems and the problem is more related to the scale of pest and disease outbreaks. Most pest and disease outbreak happen when trees are weakened by various stress factors such as very dense or over-mature stands, as a result of the forest fire or due to climate change that can change the conditions for growth as well as for pest and diseases.

PAMs to address pest and disease outbreaks can be prevention and control measures. As such the main logical measure is to promote healthy forests that can resist pest and diseases and secondary to reduce the scale of the pest and disease outbreak when they happen. Healthy forest ecosystems can be promoted through sustainable forest management. Thinning and rejuvenation of mature stands and promoting more mixed stands can improve forest health and increase resistance to insect pests and at the same time reduce the risk of forest fire (Klapwijk et al. 2016).

Forest management by PFE or FUGs is the main long term PAMs to reduce and control and pest and disease outbreak.

Control of forest pest by spraying is a short-term solution and should only be used in connection with initiatives to promote healthy forest ecosystem. If it is not possible to implement measures to promote healthy forest ecosystems, then it is most likely just a matter of time before the next pest outbreak problem will occur and this is not a cost effective approach. Other countries with boreal forests face similar issues and countries will benefit from sharing information and learn from best practices.

As some of the underlying driver is similar to the underlying driver causing favorable conditions for large forest fires some of the PAMs are also similar. This includes:

Increase resilience

Sustainable forest management including thinning of very dense natural regeneration by FUGs, promote a stronger forest sector where PFE will have enabling conditions to expand and increase the annual harvesting level and thus reduce the area with over-mature stands in production forests. This includes innovation in the use of forest resources and sustainable practices that will ensure forest regeneration. See also PAMs for improved forest management by FUG and PFE described above.

Improve decision-making process on control measures

To ensure that efforts to combat pest outbreaks will build on solid knowledge and be cost-effective an efficient process from the detection of a pest outbreak to a decision is taken on how to deal with the outbreak should be developed. This should include a clear system with specific actions based on agreed thresholds for when and which efforts will be undertaken including consideration of the financial implications. Efforts to pest outbreak will be timely or not done at all which means funding will available when the problem needs to be addressed.

Build national capacity through international collaboration

To build further capacity to deal with forests pest and diseases international collaboration and training of staff will be initiated with other countries with boreal forests that face similar problems including the consequences of climate change.

Improve national capacity to control pest outbreak

Develop a national strategy for the control of pest outbreaks taking into account the situation that climate change is expected to make pest outbreaks in boreal forests more frequent. Engage with other countries with boreal forests that face similar issues to ensure that proposed measures are following cutting edge technologies and approaches.

REDD+ outcomes

Core objective	Reduce forest degradation due to forest pest and diseases.
Co-benefit	<p>Improve forest health and resilience to minimize the negative effect of pest and diseases.</p> <p>Reduce the loss of forest resources.</p> <p>Increase harvesting levels and thereby create jobs, income and government revenue.</p> <p>Increase fuelwood production and reduce the pressure for illegal logging.</p> <p>Adaptation through sustainable forest management practices.</p>
Area covered	Production forests.
People and institutions involved	FUGs, PFEs, local forestry units MET, FRDC, Environmental Information Center of IRIMHE
Strength	Mongolia has already a lot of experience with pest control measures.
Risk	<p>Not sufficient funding available.</p> <p>Climate change is predicted to stress forest ecosystem and create more favorable conditions for pest and diseases.</p> <p>Lack of international experiences in dealing with pest and disease in a changing climate.</p>

Tree planting

Mongolia has ambitious targets for increasing the forest area. Current efforts have shown a low success rate with tree planting and there need to be a more effective approach. Success in tree planting depends on the site, whether the plant material is suitable to the site, the site preparation, the plant vitality, the planting and the protection of the plant after planting.

Mongolia has a system of subsidies for tree planting that is not sufficiently incentivizing a high success rate. In many other countries, subsidies for tree planting is linked to the success rate with one payment at the time of planting following an approved plan including species, plants per ha, location etc., and another payment

after the average plant height has reached a particular height and with a minimum number of plants per ha. To provide a sufficient incentive could mean providing a higher tariff per ha, but compared to a situation with a very low success rate this could easily prove to be cheaper and more cost-effective.

Climate change models predict that southern boreal forests are threatened. Plans for reforestation and in particular afforestation need to be realistic and focus on areas with a higher likelihood of success.

If natural regeneration is a possibility this should be the preferred option possible with some enrichment plantings to increase the diversity. This will be much cheaper than starting with planted plants only and increased resilience against fire and pest.

Improve plant quality

All commercial nurseries will receive training in nursery practices and can be certified and will thus be obliged to follow these practices in the future. For seed quality, the new Seed Law together with existing projects – bilateral with the Czech Republic and multilateral with ADB is already addressing seed quality including the genetic material used.

Incentivize high success rate of plantings

Identification of areas suitable for tree planting will improve the chance for success together with a system to incentivize a high survival rate. This can be achieved by splitting payments into two. One for the time of establishment of the plantings and one when the plants on average have reached an agreed height with a minimum number of plants per ha. The Sums Forestry Units can conduct such a control. In such a system it will be left to the contractor to identify the best system to ensure a high survival rate. One condition should be that plants have to be procured from a certified nursery and minimum plant numbers per ha. This will ensure the use of healthy plants, good site preparation and better protection of trees.

Improve regeneration practices

To ensure regeneration in forests, PFE will receive training in good forest management practices that will facilitate natural regeneration after harvesting of the older trees. This can include cleaning of the area and site preparation. Obligations to implement such practices could be specified in the forest management plans and linked to harvesting permit and Sums Forestry Units could provide quality control.

REDD+ outcomes

Core objective	Increase removals of CO ₂ by regeneration of forests
Co-benefit	Adaptation to climate change by the selection of good plant material and promoting regeneration. Improve biodiversity. Maintain the long-term production of forest services including wood production.

	Improve cost-effectiveness of tree planting programs.
Area covered	Areas suitable for forest regeneration. In order to be cost-effective it is necessary to prioritize areas suitable for tree plantings.
People and institutions involved	FUGs, PFEs, contractors, local forestry administration, MET and FRDC
Strength	A new tree seed law is underway and significant experiences with tree planting exist.
Risk	Not sufficient funding available. Climate change is predicted to make it more difficult to establish new forests in particular where the forest micro-climate has been lost. Local solution with grazing in forest plantings is not found.

Saxual forests

Saxual forest is a special ecosystem that has limited impact on emissions and removals of greenhouse gases, but high ecosystem service provision and for local communities. Nevertheless, Saxual can provide important benefits including minimizing wind velocity, protect the soil and plain, restrict sand movement, provide good livestock forage and fuelwood, and improve climate conditions. Saxaul forests are severely degraded and need protection. A GIZ funded project is currently being implemented with the aim to 1) assessed distribution and resources of Saxaul forest in Mongolia and 2) make recommendations on conservation and rehabilitation of Saxaul forest.

PAMs for the Saxaul forest in the context of REDD+ could be developed following the results emerging from this project.

Enabling PAMs

National Forest Inventory

To participate in an international REDD+ mechanism Mongolia needs to estimate forest-related emissions and removals of greenhouse gases. This requires data on forest area and forest condition/carbon stocks. This kind of information is not only needed for REDD+ but for sound policy development in general whether it is about harvesting rates, biodiversity, and other services provided by forests. A multipurpose National Forest Inventory has just been completed. This provides a good picture of the current state of the Mongolian forests.

PAM: Implementation of continued NFI as part of the National Forest Monitoring System following recommendations made by the existing NFI project which include monitoring 10% of the sample plots annually. According to the existing experiences, this will cost 1 million Euro to repeat. In order to improve information on the non-stocked forest areas these should also be monitored in addition to the areas already covered.

REDD+ outcomes

Core objective	Improve information on forest resources and forest related emissions and removals
Co-benefit	Improve the basis for good and relevant decisions on the management of the forest resources.
Area covered	The national forest area
People and institutions involved	MET and FRDC
Strength	A multi-purpose NFI has been completed.
Risk	Not sufficient funding available.

Increase staff level at the local level in order to enable them to supervise and enforce.

A number of the PAMs mentioned above require active supervision provided by the local forestry units at Soum and Aimag level.

Poor forest practices whether illegal or legal are degrading forest ecosystems, reducing resilience and making it more vulnerable to forest pest and diseases, forest fires and can cause irreversible damage to the stand's ability to natural regeneration. Poor forest practices are partly caused by ignorance and can be mitigated through training and supervision by professional foresters.

In Mongolia supervision and forest law enforcement are provided by the local forestry units: Soum Forestry Units and Aimags. These units are understaffed and not able to provide these services at sufficient level.

This PAM is to 1) nominate adequate staff numbers for each forestry unit to make it possible to supervise FUG and PFE operations and strengthen forest law enforcement, 2) allocate funding and do the recruitment and 3) provide training in SFM to local forestry units including in the development and use of forest management plans.

REDD+ outcomes

Core objective	Strengthen sustainable forest management and thus forest ecosystem resilience and thereby reduce emissions and enhance removals. Reduce the loss of carbon and forest degradation due to illegal logging.
Co-benefit	Support legal businesses producing wood products Increase government revenue by reducing illegal logging Improve biodiversity protection by protecting forests and implementing sustainable forest management practices.
Area covered	In principle all of the national forest area but with focus on areas with illegal practices and areas under active management.
People and institutions involved	Local administration at Soum, Inter-Soum and Aimag level, MET, MoF.

Strength	An on-going project to help certify forest management after international standards will help to ensure that management follow SFM principles.
Risk	Challenging to enforce on the vast Mongolian forest area – need to focus on hotspots. No funding available to increasing staff numbers at local level.

Improve inter-ministerial policy coordination

A number of the PAMs mentioned above require active participation and collaboration by a number of institutions belonging to different ministries. Inter-ministerial policy collaboration is required to ensure that PAMs are well designed and implemented.

A body representing the relevant stakeholders should be established by MET to discuss and refine policy and measures relevant for the sustainable management of forests and their implementation. The objective is to avoid “silo thinking” in different ministries, share information relevant for the management of forests and to improve the basis for good decisions regarding management of the forest resource to the benefit of Mongolia taking into account all the possible benefits and trade-offs.

Such a body should meet as required but at least twice a year and be a forum for also sharing of information relevant to the management of forests.

REDD+ outcomes

Core objective	Strengthen sustainable forest management and thus forest ecosystem resilience to the effects of climate change.
Co-benefit	Increase the effectiveness of policy initiatives. Increase cost-effectiveness. Improve biodiversity protection by protecting forests and implementing sustainable forest management practices.
Area covered	All of the national forest area.
People and institutions involved	Ministry of Environment and Tourism, International cooperation and Climate Change Coordination Department, Department of Strategy and Green Development, Department of Protected Areas Administration, Department of Forest policy and Coordination, Division of Finance & Investment, Forest Research & Development Centre, Border Protection Agency, Department of Tourism, Ministry of Agriculture (Departments of Light Industry & Department of Livestock Policy Coordination), Ministry of Construction & Urban Development, Ministry of Defence, Agency of Economic Development (Division of Sector Development Policy & Regulation), Ministry of Education, Culture, Science and Sport Ministry of Energy, Ministry of Finance, Ministry of Mining

	and Heavy Industry Ministry of Roads & Transportation, National Emergency Management Agency, National Security Council, Local government: Aimag Environment & tourism Agency Aimag Government, Soum & Inter-Soum Forest Units, Ulaanbaatar Department of Environment, Ulaanbaatar Department of Urban Planning Forest user groups, private sector and civil society: Forest User Groups, Non-Governmental Organizations and Professional Forestry Organizations
Strength	The institutions and organizations have already been involved in forest and REDD+ discussions earlier.
Risk	Some institutions see this as not relevant for their core mandate.

Awareness raising

One of the underlying drivers causing poor management of forest resource is a lack of awareness of forest and sustainable forest management and the benefits provided to society.

If the use of forest resources is only understood as an extraction activity there is a risk that forests are not managed sustainably and in particular a risk that forest activities are merely focusing on harvesting commercial timber and not on maintaining a healthy forest ecosystem.

PAM

1) Awareness of the importance of forests and climate change should be taught at the secondary school for students. 2) Professional foresters either as representative of local forestry units or as representative of professional forester's organization should provide supervision and training to FUG and PFE that are engaged in forest management operations. 3) The latter groups should be able to obtain certification following international standards for certification of sustainable forest management.

REDD+ outcomes

Core objective	Improve awareness of sustainable forest management, forest ecosystem benefits and climate change.
Co-benefit	Support PAMs to improve the management of forests. Improve the use and protection of forests.
Area covered	All of Mongolia
People and institutions involved	MET, Climate Change Coordination Office, local government at Soum and Aimag level, FUGs, PFEs, Non-Governmental Organizations, Professional Forestry Organizations
Strength	An on-going project to help certify forest management after international standards will help to ensure that

	management follow SFM principles. A project to develop silviculture guidelines for Mongolia could be very useful for this work.
Risk	Funding for the development of information material and the dissemination and training is not available.

Fulfilling household energy requirements

A significant number of households in Mongolia have individual heating of homes. A number of fuels are available for this including wood-based fuels. With a difficult economic situation, many households use various fuels types including very polluting fuels that creates air pollution. In urban areas such as Ulaanbaatar, this has negative consequences for human health which not only is a problem for the individual person or families affected but also an economic loss for the society.

Sustainable fuels such as sustainable firewood or charcoal could be part of the solution to the current heating and air pollution problems.

A program that will deliver affordable and sustainable fuelwood possible in the form of charcoal to households could not only reduce the pressure on forests for illegal logging and reduce emissions due to forest degradation. It could also reduce air pollution and create jobs and income opportunities in rural areas.

One challenge is the distance between the forest areas and the consumer. When the distance increase it becomes not economical feasible without financial support.

This PAM will require the government to set up the needed infrastructure to ensure a production of sustainable fuelwood, transport it to urban areas and distribute it at an affordable price. Private companies could be contracted to deliver the infrastructure needed, FUGs and PFE could be contracted to produce a fixed amount of fuelwood to an agreed price per m³ based on the available resources within their area. The private company contracted shall sell the products in settlements at a fixed affordable cost. The government could cover the possible loss up to an agreed limit as a subsidy for affordable sustainable heating for households. Such a program could also be targeted households will lesser income.

While there will be costs of running such a program there will also be significant economic advantages, provision of rural jobs will help to reduce rural poverty, the pressure on forest in particular close to urban areas will be reduced and thus reduce the need for additional protection and planting, air pollution will be reduced and thus improve human health.

In the long-term government subsidies could be reduced and perhaps totally eliminated as the economic situation improves and the system of providing sustainable fuelwood from rural to urban is optimized.

GIZ together with Eco Consult has developed a report on demand of supply of timber and fuelwood in Mongolia that could very useful for this work.

REDD+ outcomes

Core objective	Improve incentives for the sustainable management of forest. Reduce emissions from illegal logging leading to forest degradation and deforestation.
Co-benefit	Support PAMs to improve the management of forests. Create incentives for FUG protection of forest areas. Improve the condition of forests near urban areas. Creates jobs in rural areas and reduce poverty. Creates a more visible and stronger contribution of forest to society. Can have a positive social dimension by supporting households with lesser income. Reduce air pollution.
Area covered	Urban areas and boreal forests
People and institutions involved	MET, MoF, local government at Soum and Aimag level, FUGs, PFEs, Non-Governmental Organizations, Professional Forestry Organizations
Strength	GEF/GIZ project building capacity for FUGs to manage forests is already being implemented including testing of charcoal production.
Risk	Needed funding is not available.

Maintaining and expanding the existing network of forest roads to improve access for forest management and other forest activities.

Following a period with reduced harvesting forest roads have in many cases not been maintained and thus makes forest areas inaccessible. This has negative effects on the ability to manage forest as well as activities to manage and control forest fires and pest outbreaks.

While minor forest roads are the responsibility of the private forest company that operate in the area, larger forest roads are the responsibility of the government.

A plan for maintaining and expanding the existing network of forest roads to improve access to forest areas should be developed including a budget for the implementation and a proposed timeline for the implementation of the plan. The plan could include a prioritized list of most needed roads as it will take some years to implement such a plan.

REDD+ outcomes

Core objective	Improve access to forest areas to allow forest management interventions.
Co-benefit	Support PAMs to improve the management of forests. Creates improved conditions for the forest sector and thus jobs in rural areas. Creates a stronger contribution of forest to society.

Area covered	Prioritized forest areas where forest roads are most needed
People and institutions involved	MET, local government at Soum and Aimag level, FUGs, and PFEs
Strength	Mongolia have a network of roads that have been poorly maintained but which could form the basis of this new network of roads.
Risk	Needed funding is not available.

Monitoring and Evaluation

All selected PAMs should be monitored and evaluated sometime after their implementation with a view to adjust, strengthen or remove the PAM if needed. However, many PAMs are addressing the same driver and it can in some case be difficult to determine which PAM is effective and which is not being effective. Furthermore, a number of the drivers such as forest fire and forest pest and diseases are also natural phenomena that depend on the annual climatic conditions. Building more resilient forest ecosystem will be useful it does not change the fact that a very dry year will most likely lead to more severe forest fires regardless of the effectiveness of the PAMs compared to a year with more precipitation.

The proposed monitoring framework is therefore not focusing so much on the direct drivers but on indicators that more directly related to the effectiveness of the particular PAM.

For most indicators there need to be established a baseline to measure the outcome of the different PAMs. This can be done through surveys and in some cases through expert interviews.

Table 3. PAM monitoring indicators

PAMs		Indicator
1	Strengthen the forest sector and improve forest management	
1.1	Improve the effectiveness and engagement of FUG in Participatory Forest Management (PFM)	200 FUGs will have received training in 5 years, and 700 (i.e. an additional 500 FUGs) in 10 years and are capable of pre-commercial thinning and other basic forest management activities. FUGs will be able to manage forest and conduct pre-commercial thinning. FUG managed forests are managed better and more resilient to pest and fire. The engagement and benefits for FUGs has increased.
1.2	Improve forest management and income generation by private sector enterprises (PFE)	A prototype forest management plan has been develop and tested within 12 months. 400.000 ha of production forest for PFE have a management plan after 5

		<p>years. All production forests for PFE and 200.000 ha for FUG have a management plan after 10 years. The procedure for allocating annual harvesting levels provides long time predictability for PFE. PFE is receiving training in SFM practices and can be certified.</p> <p>The forest sector is growing in terms of production and jobs. The contribution to GDP has increased and number of jobs in the sector has increased.</p>
2	Forest fire	
2.1	Prevention by raising awareness	<p>Awareness of forest fire and how to prevent them has increased.</p> <p>Training and firefighting equipment is being provided to Soum Forestry Units and relevant communities.</p>
2.2	Improve the ability to control forest fire at local level	<p>Number of Soums Forestry Units and communities trained as trainers in efforts to control forest fires.</p>
2.3	Improve forest fire control by improving information sharing	<p>A system of detection and information dissemination has been established and made operational.</p>
2.4	Reduce the risk that forest fires expand beyond control	<p>Forest data shows that the amount of dead wood is decreasing.</p> <p>The annual harvesting volume has increased.</p>
2.5	Improve the capacity to deal with forest fire through international collaboration	<p>Regular meetings with neighboring countries.</p> <p>Staff familiar with practices implemented by other countries with boreal forest have increased.</p>
3	Forest pest	
3.1	Increase resilience	<p>The annual harvesting volume has increased.</p> <p>PFE are actively promoting regeneration after harvesting.</p>
3.2	Improve decision-making process on control measures	<p>A paper describing a clear decision-making process building on thresholds for the different forest types have been produced and agreed by the relevant agencies.</p> <p>Relevant government agencies are aware of their role in managing pest outbreaks</p>
3.3	Build national capacity through international collaboration	<p>Staff familiar with practices implemented by other countries with boreal forest have increased.</p>

3.4	Improve national capacity to control pest outbreak	A report describing advantages and disadvantages for the establishment of a national facility to produce biological substance to control pest outbreaks has been produced and approved.
4	Tree planting	
4.1	Improve plant quality	All commercial nurseries have received training in nursery practices and can be certified. Plants produced will have increased in quality including the genetic material used.
4.2	Incentivize high success rate of plantings	A system to split payment into two to incentivize higher survival rates has been developed. Survival rate has increased to at least double the current level.
4.3	Improve regeneration practices	PFE receive training and supervision in SFM. Regeneration is included as one topic of the forest management plans. Field observations verify that SFM practices are being followed.
5	Enabling PAMs	
5.1	National Forest Inventory	A NFI is being implemented.
5.2	Increase staff level at local level in order to enable them to supervise and enforce	Local level forestry units are providing support and supervision for FUG and PFE.
5.3	Improve inter-ministerial policy coordination	The coordination body is meeting twice a year and stakeholders interviewed agree that coordination has improved.
5.4	Awareness raising	Climate change is integrated in school curriculum. A system with regular supervision for FUG and PFE has been established. A certification system for SFM has been established.
5.5	Fulfilling household energy requirements	The use of legal firewood has increased.
5.6	Forest roads	A plan for maintaining and expanding the existing network of forest roads including funding has been developed and agreed.

Validation

A validation workshop was held in Ulaanbaatar on 5 December 2016. The workshop had 41 participants, five participants representing ministries and agency, six participants from local forest administrations, six participants from NGO, seven participants from FUG and PFE, seven participants from universities and scientific institutions and ten participants from international projects and organization. The participants mainly represented groups directly involved in forest use while the non-forest sector was less well represented. List of participants in annex 3.

The Consultant Team presented the 19 prioritized PAMs divided into four clusters, 1) Forest sector strengthening, 2) Forest fire, pest and disease management, 3) Tree planting and 4) Enabling PAMs. Following the presentation of each cluster of PAMs participants discussed in four separate groups with a view to validate, dismiss or correct the proposed PAMs. This discussion also resulted in additional PAMs being suggested. These additional PAMs have however not been through the same prioritization process as the existing proposed 19 PAMs, but are included here for information and possible further work. While the validation process has been useful there continue to be a need to consider appropriate PAMs for the forest in Mongolia. Efforts should also be done to reach out to stakeholders outside the traditional forest sector that nevertheless also can have activities which impact the forest sector.

Comments received from the four groups are listed in table 4 below.

Table 4. Overview of comments received at the validation workshop.

	Policy and Measures	Recommended key activities	Participants comments and advise
	One. Strengthening forest sector		
1	Strengthen the forest sector Forest User Groups	<p>Improve incentives for FUG to manage and protect forests</p> <p>They should be able to do pre-commercial thinning, remove standing dead wood, establish small business to market products</p> <p>Need training and supervision</p>	<p>Reconsider concession area for FUG, need to be reduce area for FUG concession.</p> <p>Improve cooperation between PFE and FUG. A simpler Forest Management Plan for FUG.</p> <p>Supported this action. But local forest unit should have efficient control.</p> <p>Have to consider the training methodology and type of training</p>

2	Strengthen the forest sector Private Forest Enterprises	Private Forest Enterprises needs to grow and invest	Supported
		Provide long-term clarity on harvesting levels – 10-year management plans	Create special policy for issue concession for PFE.
		Provide training and supervision for PFE	Supported
		PFE needs to be able to implement SFM	Supported
		Encourage PFE to be certified in SFM	Supported
		Use the NFI and increase harvesting levels including the area under active management	Have to consider the implementation of Forest Cleaning Program.
Two. Forest fire management			
3	Prevention by raising awareness	Prevention by awareness raising	Supported
4	Training in firefighting and purchase of equipment	Provide training to local level and sufficient firefighting equipment	Supported
		Not sufficient firefighting equipment at local level Provide training in controlled prescribed fires of steppe near forest edges to reduce the fire risk.	
5	Improve forest fire control by improving information sharing	Improve information sharing – using modern technologies to facilitate rapid suppression	Supported
6	Reduce the risk that forest fires expand beyond control	Removal of dead wood should follow as a	Propose to introduce incentives system for FUG

		consequence of other PAMs.	and PFE involved forest fire fighting.
7	Improve the capacity to deal with forest fire through international collaboration	International collaboration	Supported
Three. Forest insect and disease management			
8	Increase resilience of forests	Active management that creates healthy and more resilient forest is the best option.	Supported
9	Improve decision-making process on control measures	Establish a system with clear thresholds and economic consequences for how to deal with pest outbreak.	Have to conduct survey for result of the insect control measures.
10	Build national capacity through international collaboration	Contact should be made to countries with boreal forests such as Russia, Canada, USA, Finland etc. with a view to share information on pest and disease management of boreal forest in a changing climate. This activity could be very useful before implementing other PAMs against forest pests.	-Improve national expert skills -Create permanent monitoring plots
11	Improve national capacity to control pest outbreak	A ToR for drafting a report on advantages and disadvantages including costs for the establishing of a national facility to produce substance to control pest outbreaks should be produced and assigned to an	Producing substances is already existed. But need to have proven the quality. Review feasibilities of most effectiveness substances

		expert with good expertise.	
Four. Tree plantation			
12	Improve plant quality	Training and certification to nurseries.	
13	Incentivize high success rate of plantings	Provide incentives for high success rate by splitting payment in two, where the second payment depends on the planting meeting a minimum standard – possible with higher tariff.	Plantations have to be protected by fences.
14	Improve regeneration practices	<p>Improve regeneration practice – regeneration is the cheaper and better option when possible.</p> <ul style="list-style-type: none"> • PFE should receive training and be responsible for regeneration within their concession – should be part of the management plan 	
Five. Enabling PAM			
15	National Forest Inventory	National Forest Inventory – a need for data for policy development, harvesting allocation etc.	Increase price of inventory. Increase methodology for inventory and taxation Certified consulting company must do forest inventory
16	Increase staff level at local level in order to enable them to supervise and enforce	Increase staff numbers at local level in order for them to supervise and enforce - all this cannot be done without adequate staff at the field level.	Have to be include professional workers such as chainsaw and operator for harvesting etc. Prepare high skills forest engineers for PFE Increase wage of all forest sector's workers

			Establish a benchmark forestry
17	Improve inter-ministerial coordination	Establish a forum for Inter-ministerial coordination on forest policy development to improve the effectiveness of forest policy	Add word of agencies. Nonprofessional persons are appointed for political reason.
18	Awareness raising	Training of Private Forest Enterprises	Improve knowledge of forest silvicultural activity.
		PFEs need to operate professional and implement SFM practice.	
		They should be able to get certification.	Certified PFE have right to harvesting
19	Fulfilling household energy requirements	Fulfill household energy needs – facilitate the production and use of sustainable fuels.	Consider some renewable energy (wind and sun) usage for household heating purpose.

In addition to the above comments table 5 list some additional PAMs suggested and the rationale behind. These PAMs were in some cases proposals from individuals and did not necessarily represent the view of a majority of the participants. Nevertheless, the ideas are acknowledged as useful contributions for the further work.

Table 5. Additional PAMs proposed at the validation workshop

Additional PAM's		Rationale for PAM
One. Forest sector strengthening		
1	To create permanent management structure in forest sector	Lack of experienced human resources and lack of forest policy due to changes every four years based on the election outcome.
2	To develop Forest Unit to conduct all kind of silviculture activity and self-finance all their activities. This would be outside the current government structure as an independent State Forest Company assigned with duties to supervise the sustainable use of forests and the enforcement of rules and regulations.	Forest Unit is doing only some control work, not been involved any silviculture activity.
Two. Forest fire, pests and disease management		

3	Establish an air-patrolling agency using light airplane.	It will be given good opportunity for rapid detection of fire and control of pests.
Three. Tree Planting		
4	Increase scientific survey for breeding seedlings and reforestation.	The survival rate will increase due the based on scientific survey.
5	Protect plantation and regenerations from grazing livestock.	Most of plantations and regeneration effected by the livestock grazing in edge of forest area.
Four. Enabling PAM		
6	Increase public knowledge of forests role.	Improve the effectiveness of forest protection.
7	Conduct analysis of demand and potential supply of forests use and timber usage.	Evidence based decision making

Additional PAMs suggested during the commenting period

In addition to the PAMs proposed at the validation workshop additional PAMs were proposed during the commenting period to the first draft of this report. Some of these PAMs such as introducing stand wise sustainable forest management is already covered implicitly by the focus on developing forest managements plans for the production forests and this has been made clearer in the text, others have not been explored further and are included here to allow for further investigation.

1. Introduce stand wise sustainable forest management.
2. Introduce enrichment plantation with different tree species.
3. Analysis of climate change on seedling stocks and development of genetic improvement strategy.
4. Tree planting in riparian zones, saxual wetland areas, desertification priorities.
5. Evaluation of Forest Estate and Management Priorities in light of climate change, land use planning and socio-economic development.
6. Private Sector Business Grant Fund.
7. Climate Change Adaptation Study.
8. Tax Incentives.
9. Green Procurement & Strategies to Support Timber Processing.

Recommended Plan of Action

The first steps in follow-up on the prioritized PAMs will be to agree on a plan for their implementation with the responsible institution. Some PAMs are policy oriented and need careful consideration of the possible effect and how they can be presented to the political decision-making level. In this case, a concept note with clear pros and cons should be prepared. This includes PAMs related to the improved engagement of FUG and changes to the method of annual harvesting allocation for PFE. In some cases, the responsible institution can do this in other cases, it will be more effective to engage assistance from outside.

Some PAMs have clear financial implications, this includes adequate staffing of local Forest Management Units; developing of management plans, implementing NFI, provision of adequate firefighting equipment to communities expected to participate in controlling forest fires; support to the provision of fuelwood to households etc.

It has not been possible to estimate costs associated with the different PAMs as this requires more information to be estimated e.g. for developing forest management plans there is first a need to decide on a prototype management plan which could include piloting different approaches. This work should also includes costs estimates for the different approaches.

For most PAMs, there is a need to estimate the needs and prepare a budget estimate before further decisions will be made. In some cases, this can also build on earlier works by other projects such as the NFI. Realistically not all PAMs will be funded from the start, and in some cases it will be possible to seek funding from international

funding sources. In both cases, reliable budgets need to be developed together with a sound rationale for why this is a priority. This report has only taken the first step in this direction and further work will need to be done.

In some cases, PAMs can also be expected to generate additional revenue for the government as well as local jobs and income. Whether this will be used to fund other PAMs is a policy decision to be made by the government.

In some cases, PAM only need minor efforts or continuation of existing efforts. International collaboration on forest fire is already taking place but can be enhanced. With the effect of climate change this type of collaboration becomes more important both in relation to forest fire, forests pest and diseases and management of boreal forests in general. Management regimes have to adapt to this new situation that will add additional stress on boreal forest ecosystems.

Table 6. Recommended action plan for suggested PAMs

PAM	Recommended action	Respondent	Time period	Budget source
Strengthen the forest sector and improve forest management				
Improve the effectiveness and engagement of FUG in Participatory Forest Management (PFM)	A clear description of the problems with the legal framework and proposed solution should be described. FAO has already worked on this. Regarding training FAO is already training FUG and further action should build on this.	MET, FRDC	2017-2018	State budget, FAO, GEF project
Improve forest management and income generation by private sector enterprises (PFE)	A proposal for how the current annual harvest allocation system can be replaced with a system building on 10 years' management plans should be developed. This should build on the most recent data on available timber for harvesting. This will include developing a proposal for a prototype forest management plan including which parameters to include, how to store the information and how to link it to harvest allocations and regeneration needs. This will also include developing costs estimates for developing management plans and a proposal for how to contract this assignment to a company if the resources to do this are not available in the ministry. A proposal for training PFEs in SFM practices should be developed. This can then be done by the relevant government agency or out-sources to professional forester's organization. Efforts to promote certification should be supported. This is already happening with support from GIZ.	MET, MFALI, International projects and MSFM NGO	2017-2020	State budget, PFI investment

Saxual forest	PAMs for this area will follow recommendations to be made by an on-going project assessing the situation and the possible problems with Saxual forest management.	MET, GIZ	2017	GIZ
Forest fire				
Prevention by raising awareness	Institutions and experts working with forest fire control measures should be interviewed and information should be disseminated through mass media.	MET, NEMA	Every year	State budget
Training in firefighting and purchase of equipment.	Experts should develop a training program for local communities in firefighting including budget for its implementation. A list of needed firefighting equipment should be produced and subsequently procured. Collaboration with existing overlapping initiatives should be ensured.	MET, NEMA	2017-2020	State budget, International donors
Improve forest fire control by improving information sharing	A working group with experts from relevant institutions should develop a proposal for such an information collection and sharing system including a budget for the implementation.	MET, NEMA, Local Governors	2018	State budget , International donors
Reduce the risk that forest fires expand beyond control	Removal of dead wood should follow as a consequence of other PAMs.	MET, NEMA, Local Governors, Forest units	Since 2017	State budget, PFE and FUG investment
Improve the capacity to deal with forest fire through international collaboration	Regular meetings with neighboring countries should be promoted. Experts on forest management from USA and/or Canada should be invited to Mongolia to share experiences.	MET, NEMA	2017	State budget
Forest pest				
Increase resilience	This should follow from the implementation of other	MET, Local	Since 2017	State budget,

of forests	PAMs.	Governors, Forest units		PFE and FUG investment
Improve decision-making process on control measures	A working group with experts from relevant institutions should develop a proposal for such a decision-making process including possible additional activities in terms of monitoring as well as budget implications.	MET, Scientific institutions	FRDC, 2018	State budget
Build national capacity through international collaboration	Contact should be made to countries with boreal forests such as Russia, Canada, USA, Finland etc. with a view to share information on pest and disease management of boreal forest in a changing climate. This activity could be very useful before implementing other PAMs against forest pests.	MET, FRDC	2018	Not required specific budget
Improve national capacity to control pest outbreak	A ToR for drafting a report on advantages and disadvantages including costs for the establishing of a national facility to produce substance to control pest outbreaks should be produced and assigned to an expert with good expertise.	MET, Scientific institutions	FRDC, 2018-2019	State budget
Tree planting				
Improve plant quality	An assessment of the current status for nursery practices should be undertaken and a program for training in nursery practices should be developed. A process for certification of nurseries should be developed.	MET, Universities, NGO	FRDC, 2018-2019	PFI investment
Incentivize high success rate of plantings	A proposal for a more effective system for incentivizing reforestation should be developed. As a first step this should be described in a proposal.	MET, FRDC	2017-2019	State budget
Improve regeneration practices	The training of PFE in SFM practices should include training in practices to promote natural regeneration.	FRDC, PFI	Since 2017	State budget, PFI investment

Enabling PAMs					
National Forest Inventory	Based on a proposal for a continued NFI a proposal for how to secure funding should be developed.	MET, FRDC		2019-2020	State budget
Increase staff level at local level in order to enable them to supervise and enforce	A working group should be established to clarify the role and responsibilities for Aimags and Soum Forestry Units and criteria for determine adequate staff numbers for each local unit should be developed. This can be based on forest area, productive forest area etc. A budget for following the recommendation made by the working group should be developed.	MET, Local Governors, Forest units		2017	State budget
Improve inter-ministerial policy coordination	MET should propose a ToR for a new inter-ministerial working group.	MET, MFALI, MECSS, NEMA, MJEA		2017	Not required specific budget
Awareness raising	Ministry for Education, Culture, Science and Sport should be approached for a discussion on how climate change and forest can become part of the school curriculum. A system with supervision for FUG and PFE activities should be established. This can be annually or when needed. A system for certifying SFM should be developed.	MET, MFALI, MECSS, International projects and NGO		2017	State budget, International donors
Fulfilling household energy requirements	Discussions with city authorities on long-term plans for energy consumption including heating of homes should be initiated. Contact should be made to a World Bank supported project looking into heating supply to the Ger districts with a view to explore possible synergies. A proposal for the role of wood based energy should be developed that take into account the potential for	MFALI, MET, City Mayer,		2018	Not required specific budget

	a sustainable and economically feasible production. Depending on the outcome of this discussion a			
Forest roads	Based on a mapping of forest resources where forest management is hampered due to the lack of forests road infrastructure a plan for which roads to be re-established or established from new should be developed. This will need consultation with the companies operating in the areas.			

Conclusion

Mongolia has significant forest resources that are under increasing pressure from the effects of climate change. PAMs developed and prioritized as part of this report thus address both mitigation and adaptation aspects relevant for the Mongolian forest..

The recently completed NFI provides a picture of a forest with many over-mature stands that from a forest management point of view could benefit from harvesting. Seen in connection with the aggravated effects of forest fire, pest and diseases that are expected to follow from climate change there is strong arguments for strengthening forest management to build resilience and improve the ability of the forest to adapt to climate change. This should include harvesting and rejuvenation to develop forest stands with more tree species with a better balanced age class distribution. Harvesting should be within the limits of sustainability according to the stands where there harvesting takes place. Management plans can provide information on allowable harvest quantities, on areas where regeneration should be promoted and where enrichments plantings should take place to enhance tree species diversity. Supervision and support from professional foresters will be needed.

Sustainable forest management is the most obvious PAM to prioritize as it addresses most of the underlying drivers. This will require involvement of relevant government ministries as well as Soum and Aimag Forestry Units, PFE and FUGs.

However, current policies, rules and regulations do not promote the development of a strong forest sector. This includes both engagement of FUGs and the investments of the PFEs. Enabling conditions could easily be introduced that would alleviate this situation. Whether this is sufficient remains to be seen but support for various production streams could also be considered.

From an economic perspective increased harvesting and a strengthening of the forest sector can generate jobs and income in the rural economy as well as revenue for the government. This will obviously have to take place within the limits of sustained yield, which will have to be determined through management plans based on inventory data.

Enabling conditions include training and supervision in sustainable forest management practices. Harvesting and regeneration should go hand in hand to secure the future supply of forests resources. Public and private forest organizations can help and support certification of sustainable forest management.

Existing efforts to control forest fire and pest management should be reconsidered in light of the anticipated effects of climate change. Control measures can be improved including by providing training and equipment to communities e.g. for fire control, but any long term strategy should include improving the resilience of forest ecosystems. Spraying for the same forest pest every two or three years without improving the resilience is not cost-effective.

Tree planting should only take place in areas where plants have a high likelihood of survival and where they can be protected from grazing livestock. Mongolia has some very ambitious targets for expanding the forest area. The current system of supporting tree planting is not cost-effective and should be improved.

Mongolians are very depended on energy for household heating. Wood-based products can play an important role and generate jobs at the same time, but the distance between supply and demand is in some cases an obstacle. Support to overcome this will be useful both for the forest and the consumer.

References

FAO (2014) project document, GCP/MON/002/NET, Project Final Evaluation Report.

FAO (2015). Global Forest Resource Assessment.

Flanningan, M., Stocks B., Turetsky M. and Wotton M., (2008). Impacts of climate change on fire activity and fire management in the circumboreal forest. *Global Change Biology*, 14, pp 1-12.

FRDC 2014. Report on Forestland of Mongolia. Ulaanbaatar, Mongolia.

FRDC 2015. Report on Forestland of Mongolia. Ulaanbaatar, Mongolia.

Gautier S., Bernier, P., Kuuluvainen, T., Shvidenko, A.Z. and Schepaschenko D. G., (2015). Boreal forest health and global change. *Science*, Vol. 1349, Issue 6250, pp 819-822

Gilmour, D., (2012). Capacity Building and Institutional Development for Participatory Natural Resources Management and Conservation in Forest Areas of Mongolia

HijabaYkhanbai, (2009). Mongolia Forestry Outlook Study, FAO Asia-Pacific Forestry Sector Outlook Study II, Working Paper No. APFSOS II/ WP/ 2009/ 21.

Horst, A. (2016). REDD+ Compatible National Forest Inventory of Mongolia, Evidence-based Recommendations from the Multipurpose National Forest Inventory for National Forest policy Implementation (In prep.)

IPCC, 2003. Definitions and Methodological Options to Inventory Emissions from Direct Human-induced Degradation of Forests and Devegetation of Other Vegetation Types.

Iversen P., Lee D. and Rocha, M., (2014). Understanding Land Use in the UNFCCC.

Klapwijk, M., Bylund, H., Schroeder M. and Björkman C., (2016). Forest management and natural biocontrol of insect pests. *Forestry*, 0, pp. 1-10.

Koven, C.D., (2013). Boreal carbon loss due to poleward shift in low-carbon ecosystems. *Nature Geoscience* 6, 452–456.

Kurz, W.A., Stinson, G., and Rampley, G. 2008. Could increased boreal forest ecosystem productivity offset carbon losses from increased disturbances? *Philos. Trans. R. Soc. Lond. B Biol. Sci.* 363(1501): 2261–2269.

Kurz, W.A., Shaw, C.H., Boisvenue, C., Stinson, G., Metsaranta, J., Leckie, D., Dyk, A., Smyth, C., and Neilson, E.T. 2013. Carbon in Canada's boreal forest – a synthesis. *Environ. Rev.* 21(4): 260–292.

Ministry of Environment and Green Development of Mongolia (2014), Mongolia Second Assessment Report on Climate Change.

Narangerel, Z., Nandin-Erdene, G., de Lamo, X., Simonson, W., Guth, M. and Hicks, C. (2016) Using spatial analysis to explore potential for multiple benefits from REDD+ in Mongolia. Joint report of the Information and Research Institute of Meteorology, Hydrology and Environment (IRIMHE), UNEP World Conservation Monitoring Centre and Mongolia National UN-REDD Programme, Ulaanbaatar.

Sved, Johnny (2011). Forest Management Guidelines - For Forest User Groups in Mongolia, Forestry Development Centre Tapio, Finland

Tsogtbaatar J. et al. (2015) Assessment Report of the Current Condition of Saxaul Forest in Mongolia, GIZ report.

UN-REDD Programme (2013), Entry points and strategic options for mainstreaming financing for sustainable forest management into sectoral budgets

UN-REDD Programme (2013). Forest Sector Financing Flows and Economic Value in Mongolia

UN-REDD Programme (2016), Preliminary Assessment of the Drivers of Forest Change in Mongolia: A Discussion Paper for Supporting Development of Mongolia's National REDD+ Strategy

World Bank (2004). Mongolia Forestry Sector Review

World Bank, (2006). Wood Supply in Mongolia: The Legal and Illegal Economies. Mongolia Discussion Papers. Washington, D.C.

Narangerel Hicks, C., de Lamo, X. and Guth, M. (2016) Report of Consultations on multiple benefits from forests in Mongolia in Khovsgol and Tov Aimags, 3-6 November 2015. Prepared on behalf of the UN-REDD Programme. Information and Research Institute of Meteorology, Hydrology and Environment (IRIMHE), Ulaanbaatar, and UNEP World Conservation Monitoring Centre, Cambridge.

Zamolodchikov, D. G., Grabovskii, V. I. and Kraev G. N., (2011). A Twenty Year Retrospective on the Forest Carbon Dynamics in Russia. *Contemporary Problems of Ecology*, Vol. 4, No. 7, pp. 706-715.

Zamolodchikov, D. G., Grabovsky, V. I., Shulyak, P. P. and Chestnykh, O. V., (2013), The Impacts of Fires and Clear-Cuts in the Carbon Balance of Russian Forests. *Contemporary Problems of Ecology*, Vol 6. No. 7, pp. 714-726

Annex 1. List of consultations and meetings

	Meeting field	Attendees and participants	Date
1	PLR of forest sector	Officers of Forest Policy and Coordination (DFPC)	12 September 2016
2	Forest silvicultural activities, forest management, insect control and NFI	Director and Heads of division of Forest Research and Development Center (FRSC)	20 September 2016
3	PFE and timber processing plants	Chairman and manager of Association of Timber Processing Enterprises	14 September 2016
4	Government strategic vision of forest sector	Director of Department of Strategic Planning	12 September 2016
5	Grazing and livestock policy and management	Director of Livestock Policy Coordination Department. MFALI	02 December 2016
6	Forest concession and practical management of forest	PFE and FUG representatives from Tunkhel village of Selenge province	20 September 2016
7	NFI and GIZ project introductory	GIZ programme director and experts	24 September 2016

	Workshop and round table discussion		Date
1	Workshop on forest fire management	Organized by REDD+ PIU and MSFM. Total 25 participants from PFE, Local administration, FUG, MET and NEMA delegations	16 September 2016
2	Workshop on pest management	Organized by REDD+ PIU and MSFM. Total 35 participants from PFE, Local administration, FUG, MET and Universities and Scientific Institutions.	18 September 2016
3	Workshop on the initial selection and prioritization of policies and measures for reducing emissions from deforestation and	Organized by REDD+ PIU. Total 71 participants from PFE, Local administration, FUG, MET and Universities and Scientific Institutions.	22-23 September 2016

	degradation in Mongolia		
4	Workshop on forest scientists	Organized by MET and MNU. Total 54 scientists.	
5	Workshop on Forest private sector	41 participants from wood processing plants, FUG, PFE and Scientific institutions. Organized by FWFA NGO with REDD+PMU	15 September 2016
6	PAM Validation workshop	Organized by REDD+ PIU and MSFM. Total 52 participants from PFE, Local administration, FUG, MET and Universities and Scientific Institutions.	5 December 2016

Annex 2. Assessment of the Mongolian Forest Policy, Laws and Regulations

Name of the law		Adopted year, No of the resolution	Law implementing ministry and agency	Provisions consistent with REDD+ programme, drivers of forest degradation and deforestation
State policy and programme on environment and forest				
1	National security concept of Mongolia	The Parliament of Mongolia, Resolution#48 of 2010	Government, MNET, other ministries, agencies, the aimag and capital administration	3.5.3....Prohibit export of wild plants, forest-derived resources and logging and increase the forest reserve by two percent, resolve the issue of fuel in a comprehensive manner, implement the policy for increasing the import of wood and wood-substituting materials, encourage increased engagement of civil society, private organizations and local population in forestation and reforestation.
2	Green development policy	The Parliament of Mongolia, Resolution#43 of 2014	Government, MNET, other ministries, agencies, the aimag and capital administration	3.3. Conserve pristine nature and maintain ecosystem sustainability by protecting at least 60 percent of fresh water reserves and stream formation areas, expanding protected areas to 25 percent by 2020 and 30 percent by 2030, and creating sustainable financing mechanisms for protection. 3.9. Enhance the carbon sequestration by implementing sustainable forest management.
3	Mongolia's Sustainable Development Agenda-2030	The Parliament of Mongolia, Resolution#19 of 2016	Government, MNET, other ministries, agencies, the aimag and capital administration	Objective 2. Introduce environmentally friendly advanced technology and reduce carbon emissions in the industry, application, Phase I (2016-2020): promote renewable energy, coal, natural gas liquefaction, and reduce greenhouse gas emissions by 2 percent from the estimated current forecast for Combating Desertification advanced gasification technology, to 8.5 percent of the total land area of 25% the size of protected areas, forest-covered area. / 2.3.3/
4	The State Forest policy	The Parliament of Mongolia, Resolution#49 of 2015	Government, MNET, other ministries, agencies, the aimag and capital administration	4.1. The State forest policy shall be implemented by two main stages: the first stage in 2015-2020 and second stage in 2020-2030. 4.5.The greenhouse gas emissions from forest degradation and deforestation shall be reduced by 2 percent in 2020 and 5 percent in 2030.

5	Green Wall National programme	The Government of Mongolia, Resolution#44 of 2005	MNET, the aimag and capital, soum, district's administration	Reforestation will be carried out in the stages as 2005-2015, 2015-2025 and 2025-2035.
6	National programme on Forests	On Approval to renew the programme, The Government resolution No. 248 of 2001 On the program amendment, The Government of Mongolia, Resolution#113 of 2001	MNET, MOFALI, the aimag and capital, soum, district's administration	Two. Objective of the programme: 1. To implement urgently and arrange measures for prevention and fighting of forest fire, harmful insects and diseases; 2. To introduce modern machinery and technology in wood processing industry, raise the utilization effectiveness, 3. To conduct reforestation at first in head-water area of rivers, logged areas and forest areas affected by forest fire and insects, accordingly increase tree seeds harvesting and breeding of tree seedlings. 4. To refine institutional structure and management in forestry and wood industry sector 5. To apply modern technology and scientific achievement in the practice and develop international collaboration in forestry and strengthen personal capacity of the sector Three. To implement the programme in 2005-2015
7	Forest cleaning program	The Government of Mongolia, Resolution#30 of 2014	MNET, MOFALI, the aimag and capital, soum, district's administration	2..2. The objective of the programme is to make healthy and improve the forest situation, to ensure rehabilitation by implementing forest cleaning measures without negative influence to ensure the wood demand and supply of timber harvested by forest cleaning. 4.1. To implement the programme in 2014-2016 and 2016-2020
The legal environment of natural resources and water, land use				
8	The Constitution of Mongolia	Great Khural Plenary session / 13.01.1992/	Government, ministries, the aimag and capital, soum and district's administration	The land, its subsoil, forests, water, fauna and flora and other natural resources in Mongolia shall belong exclusively to the people and be under the State protection. Article 6.1.
9	Criminal Law of Mongolia	Session of the State Great Khural 03.12. 2015.	MNET, MOJHA, the aimag and capital, soum, district's administration	Article 24.7. 1. If forest and steppe wildfire is occurred due to negligent treating with fires and flammable and caused severe damage to human body and/or caused human death and/or caused damage of large amount it shall be punishable by imprisonment for term of one year to five years. 2. If forest and steppe wildfire is set intentionally, it shall be punishable by imprisonment for term of two years to eight years.
10	Civil law of Mongolia	Session of the State Great Khural /10.01.2002/	MOJHA, the aimag and capital, soum, district's administration	Article 1. 1.1. The purpose of the Law shall be to regulate relationship with respect to material and non-material wealth arising between legal persons and ensure equality and autonomy of participants to the civil legal relations,

				sanctity of their property, contract freedom, non-interference into personal affairs, unlimited exercising of civil rights and fulfillment of obligations.
11	Law on environmental protection	Session of the State Great Khural / 30.03.1995/	Government, MNET, other ministries, the aimag and capital, soum and district's administration	Article 1. The purpose of this law is to guarantee the human right to live in a healthy and safe environment, an ecologically balanced social and economic development, the protection of the environment for present and future generations, the proper use of natural resources and the restoration of available resources.
12	Law on Environmental impact assessment	Session of the State Great Khural /01.05.2012/	Government, MNET, other ministries, administration of the Aimag and capital, soum, district	Article 1. The purpose of this Law is to protect the environment, prevent ecological imbalance, ensure minimal adverse impacts on the environment from the use of natural resources, and regulate relations that may arise in connection with the assessment of environmental impacts of and approval decisions on regional and sectoral policies, development programs and plans and projects.
13	Conflict of interest law in Mongolia	Session of the State Great Khural /04.12.2015./	Government, MNET, other ministries, administration of the Aimag and capital, soum, district	Article 1.1.1. The purpose of this law is to consider the actions and omissions conflicts violated with respect to laws and administrative rules and impose it done and penalties to legal entities and to strengthen the justice system. Article 6 determined the amount of the violation penalty by related laws such as forests, water, wildlife, plants, air, land and subsoil.
14	Law on Land	07.06.2002	MNET, MOFALI, MCUD, administration of the Aimag and capital, soum, district	Article 1.The purpose of this law is to regulate possession and use of state-owned land and other related issues. The land was classified as lands with forest resources according to the Article 6.2.4.
15	Law on Land fees	Session of the State Great Khural /24.041997/	MNET, MOFALI, MCUD, administration of the Aimag and capital, soum, district	Article 1. The purpose of this law is to charge citizens, business entities, and organizations with fees for possessing and/or using state-owned land, and to regulate the relations arising from paying the fees to the state budget.
16	Law on allocation of land to Mongolian citizens for ownership	Session of the State Great Khural /22.06.2002/	MNET, MOFALI, MCUD, administration of the Aimag and capital, soum, district	1.1. The purpose of this law is to govern allocation of land to citizens-families of Mongolia for ownership and related relations arisen out of such allocation.
17	Law on Soil protection and prevention of desertification	Session of the State Great Khural /17.05. 2012/	MNET, MOFALI, MCUD, administration of the Aimag and capital, soum, district	It is indicated regarding to maintain agriculture with forest belts in article 6.2.2, to protect the forests and vegetation, reforest in article 6.2.4.

18	Law on water	Session of the State Great Khural /17.05.2012/	Government, MNET, MOFALI, other ministries, administration of the Aimag and capital, soum, district	Article 1. The purpose of this law is to govern relations concerning the protection and rational use and restoration of water resource and its basin.
19	Law on Water pollution fees	Session of the State Great Khural /17.05.2012/	Government, MNET, MOFALI, other ministries, administration of the Aimag and capital, soum, district	Article 1. 1.1. The purpose of this law is to govern relations concerning the imposing of fees payable by entities and organizations that pollute water resources and paying the fees to the state budget.
20	Law on Genetically Modified Organisms	Session of the State Great Khural /28.06.2007/	Government, MNET, MOFALI, other ministries, administration of the Aimag and capital, soum, district	Article 1. 1.1. The purpose of this Law is to regulate the relations in respect of producing, handling and use of genetically modified organisms, its trans-boundary movement through the state border and protection of bio-safety within the state territory.
Law on mining				
21	Law on Subsoil	Session of the State Great Khural /29.11.1988/	MMHI, MNET, other ministries, administration of the Aimag and capital, soum, district	Article 41 ¹ .1. Users of subsoil shall have a duty to implement actions to protect the environment, and shall, for this purpose, have ecological assessments and environmental impact assessments done by relevant professional authorities [specialised agencies]. They shall keep these assessments together with their drawings of the subsoil and deposits and technical documentation.
22	Law on Common Minerals	Session of the State Great Khural /09.01.2014/	MMHI, MNET, other ministries, administration of the Aimag and capital, soum, district	Article 1. 1. The purpose of this law is to regulate relations within the territory of Mongolia with respect to prospecting, exploration and mining, granting a license of common minerals, protecting the rights and obligations, prospection and exploitation areas of special license holder and restoration.
Legislation on Forests				
23	Law on Forests	Session of the State Great Khural, 17.05.2012	MNET and other ministries, administration of the Aimag and capital, soum, district	Law on Forests defines many important issues, such as forest ownership under the contract, forest and protection use in accordance with the management plan, preventing of forests from forest fires, harmful insects and diseases.
24	Regulation for forest ownership under the contract	The Government of Mongolia, Resolution#227 of 2009	MNET, administration of the Aimag and capital, soum, district	The criterion and period, reporting work for forest ownership under the contract " are regulated.

25	On adoption of the list	The Government of Mongolia, Resolution#255 of 2012, Resolution#79 of 2016	The Government, MNET	Normative of responsible forest area, location of inter-forest units to be established in aimag, capital were approved.
26	Draft of "Regulation for timber harvesting from the forests"	The draft of the regulation has developed. It's under the step of approval.	MNET, administration of the Aimag and capital, soum, district	to make contract on timber harvesting, to certificate and to grant certificate of origin and to control for timber harvesting.
27	On adoption of the rule	Order# A-153 of 2013 of Minsiter of MEGDT	MNET, administration of the Aimag and capital, soum, district	"Regulation on forms of certificate for timber harvesting from the forests and certificate of origin"
28	On adoption of the rule	Order# A-96/71 on 29th of March of 2013 of Minsiter of Ministry of Environment and Green Development, Tourism	MNET, administration of the Aimag and capital, soum, district	The regulation for planning and managing reforestation and silviculture measures, financing, evaluating planted forests, purchasing in the state forest fund, ownership.
29	On Renewal of approval of the regulation	The Government Resolution No. 105 of 2013	MNET	On work methodology and their arrangement for conducting forest inventory and taxation inventory/Article 2, 3/
30	On adoption of the rule	The Government Resolution No. 137 of 2006	MNET, MOFALI, administration of the Aimag and capital, soum, district	To grant rights of environmental professional organizations to entities and organizations
31	On adoption of the rule	1 st annex, joint order# A/140/63 of 31 of March, 2015, of Minister of Finance and Minister of Nature and Environment	MNET, MOFALI, administration of the Aimag and capital, soum, district	To provide incentive for forest protection and planting of seedlings.
32	Law of the Prohibition of Mining Operations in the Headwaters of Rivers, Protected Zones of Water Reservoirs and Forested Areas	Session of the State Great Khural 16.07.2009	MMHI, MNET, administration of the Aimag and capital, soum, district	It defines to revoke operation licenses and prohibit mining prospection and exploitation in the headwaters of rivers, protected zones of water reservoirs and forested areas.

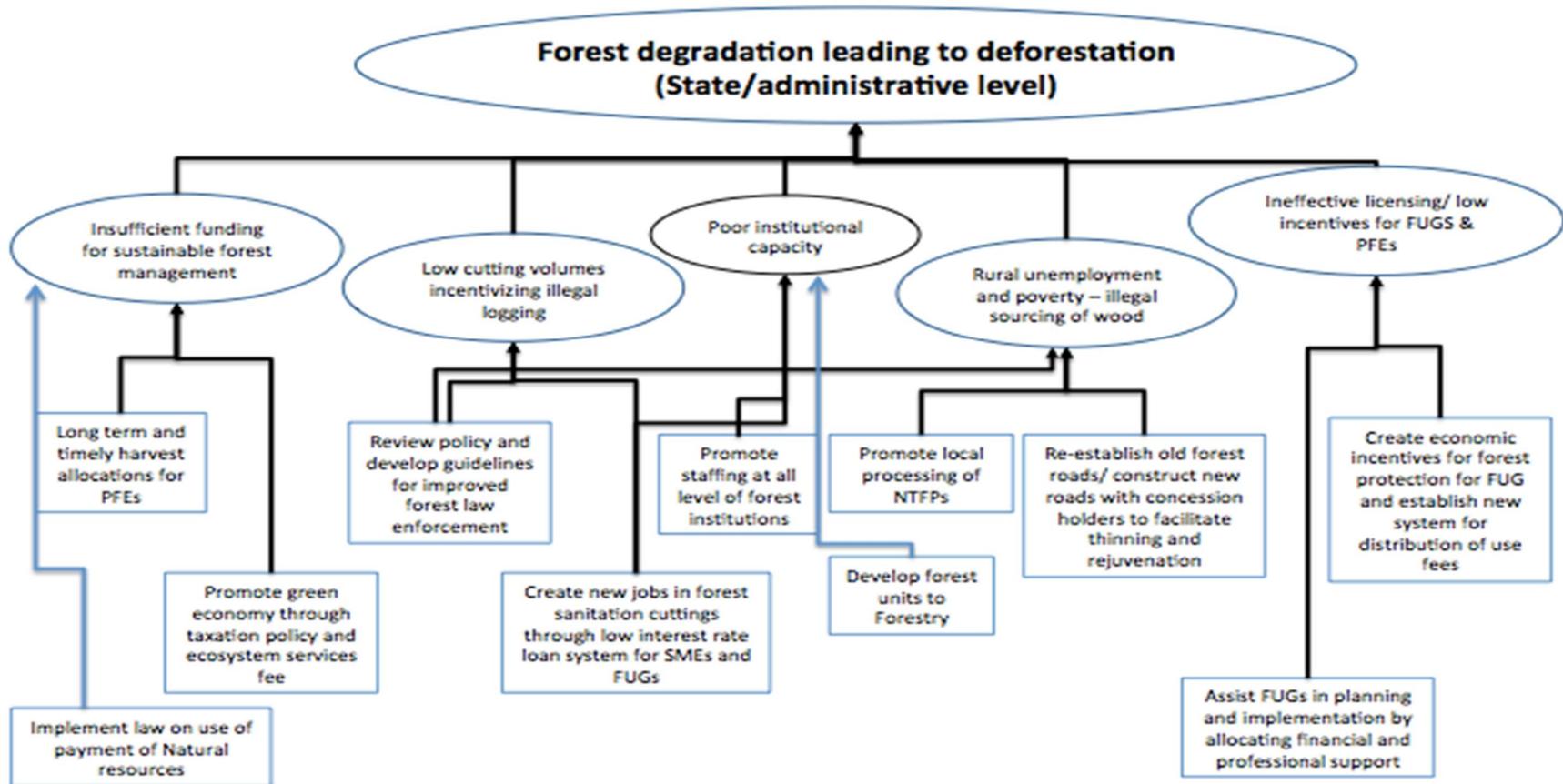
	/to revoke license within 5 months/			
33	On amendment of Law on export customs duty on some products	Session of the State Great Khural 08.01.1999	MNET, MOFALI, CGA, administration of the Aimag and capital, soum, district	It was imposed export customs tax of 150.0 thousand tugrik on round wood, lumber, sawnwood and restricted the timber export.
34	Law on Disaster Protection	Session of the State Great Khural, /20.06.2003/	MNET, NEMA, administration of the Aimag and capital, soum, district	To include forest fires in disaster and carry out measures for fire prevention and protection /4.1.2/
35	Law on Fire safety	Session of the State Great Khural, /02.07.2015./	MNET, NEMA, administration of the Aimag and capital, soum, district	4.1.1. To prevent object and forest and steppe fires, rescue, ensure integrated management and policy, implement the state fire control work; 10.1.Fire fighting units organize the object and forest fire-fighting operations under rule for fire extinguishing.
36	On adoption of the rule and list	The Government Resolution No. 106 f 2013	MNET, NEMA, administration of the Aimag and capital, soum, district	The works for estimation of damages to the forest and steppe fires, and fire prevention are regulated and the items of the fire essential equipments and citizens' personal supplies, the list of the method and technique to be necessarily obtained were released.
37	On cooperation in field for preventing of industrial accidents and natural disasters and eliminating their consequences	Agreement between the government of Mongolia and the government of Russian Federation /1995/. XIII-22. 10.2014.	MNET, NEMA, administration of the Aimag and capital, soum, district	To cooperate Mongolia and Russian Federation on preventing of industrial accidents and natural disasters and eliminating their consequences
38	On forest fire prevention	Agreement between the government of Mongolia and the government of Russian Federation /03.09.2014/	MNET, NEMA, administration of the Aimag and capital, soum, district	To cooperate on preventing and fighting with transboundary forest fires near boundary of Mongolia and the Russian Federation.
39	On cooperation regarding to fighting with transboundary forest and steppe fires fighting with	Agreement between the government of Mongolia and the government of the People's Republic of China /05.07.1999/	MNET, NEMA, administration of the Aimag and capital, soum, district	To cooperate on fighting with transboundary forest and steppe fires near boundary of Mongolia and the People's Republic of China.

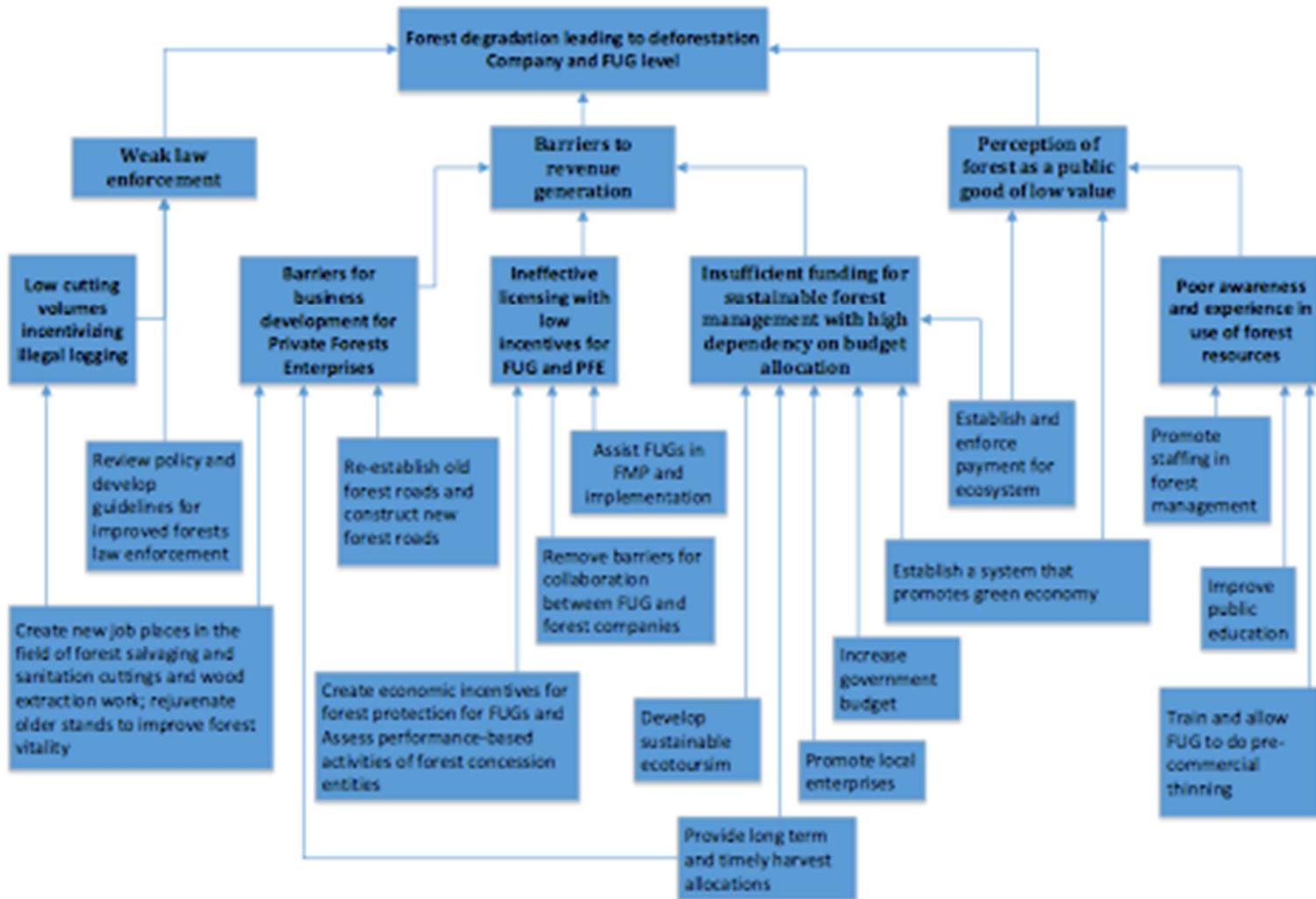
	transboundary forest and steppe fires near boundary			
Financing of forest measures and economic incentives				
40	Law on fees for natural resources use	Session of the State Great Khural 17.05.2012/	MF, MNET, administration of the Aimag and capital, soum, district	Article 18. It defines that revenue from forest resources use fees of 85 percent shall be spent on environmental protection and natural resources restoration measures.
41	On adoption of the rule	The Government Resolution No. 43 of 2014	MNET, administration of the Aimag and capital, soum, district	" Regulation on forming part of the revenue, spending and reporting fee to spend on environmental protection and its restoration"
42	On adoption of the rule	The Government Resolution# 59 of 2010	MNET, administration of the Aimag and capital, soum, district	To give an incentive citizens and FUGs economic entities, organizations who had reduced the harmful impacts to the forest, introduced advanced methods, technology"
43	On adoption of the rule	By joint order# 342/366, 2006 of Minister of Finance and Minister of Nature and Environment	MNET, administration of the Aimag and capital, soum, district	Regulation for providing monetary incentives citizens who revealed violations of environmental laws or regulations and gave real information on violations", "Regulation for rewarding the state environmental inspector and ranger from revenue of natural resources' sale that were prepared illegally and confiscated"
44	Law on exempting from Customs tax	Session of the State Great Khural /07.06. 2013/	MOFALI, CGA, economic entities	Article 1. To exempt imported /4410.12/ oriented strand board /OSB/, wooden design which was made according to the standart, ready to construct from customs tax duty.
45	Law on exemption from valued added tax	Session of the State Great Khural 07.06.2013.	MNET, CGA, economic entities	To exempt works of reforestation and horticulture, silviculture from value added tax duty./ until 2017.12. 31/
46	On adoption of the list	The Government Resolution#230 of 2013	MOFALI, CGA, economic entities	The list for exempting of imported wood and wooden materials from value added tax/
Special protected areas				
47	Law on Special protected areas	Session of the State Great Khural / 14.11.1994/	MNET, administration of the Aimag and capital, soum, district	Article 1. The purpose of this law is to regulate relations concerning utilization of and taking areas under special protection, preservation and protection of natural landscape in order to keep particular features of natural zones and belts, their peculiar formation, forms of rare and rarest fauna and flora, historical and cultural sites and natural sightseeing as well as studying and identifying their evolution.

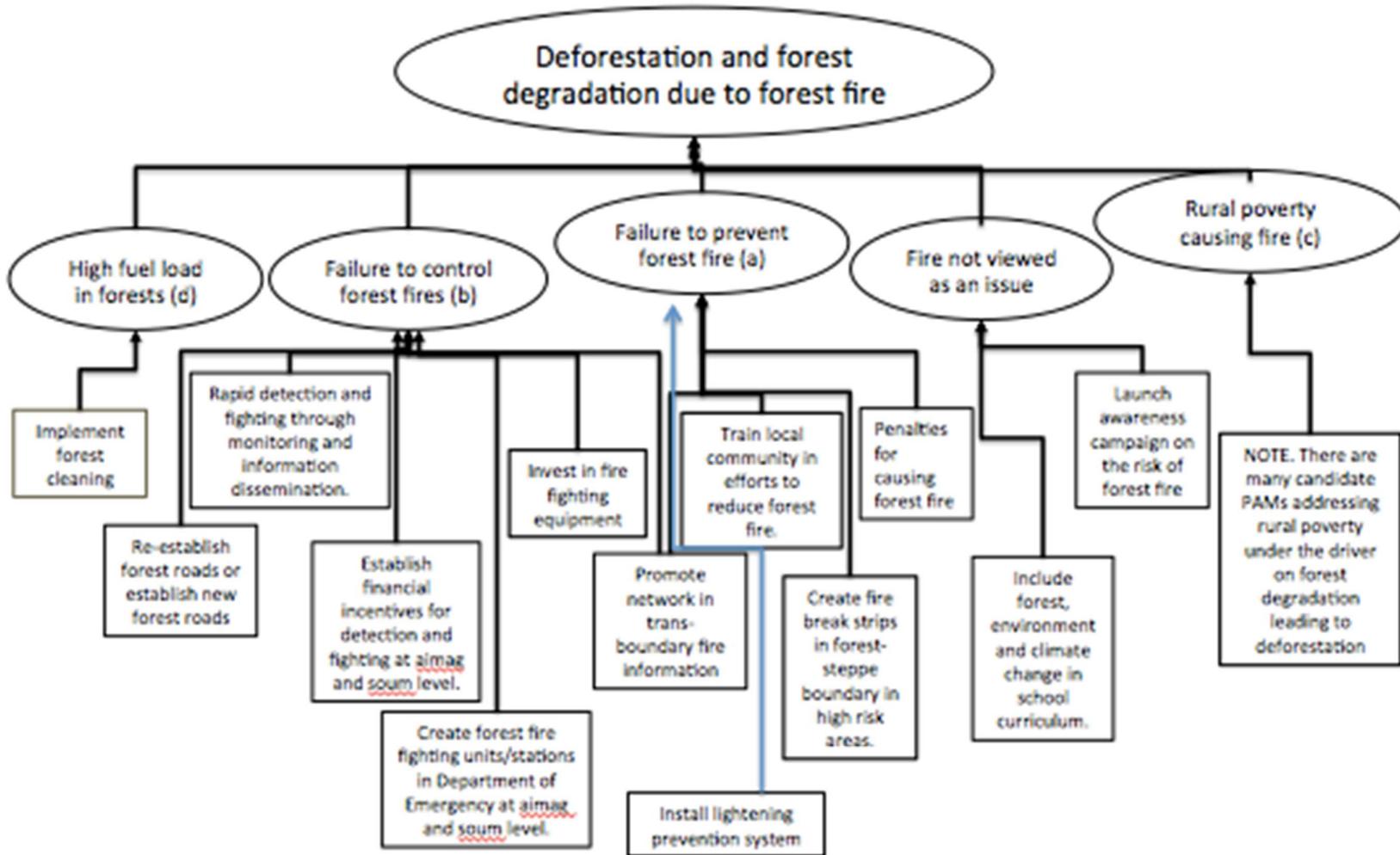
48	Law on Buffer zone of Special Protected Areas	Session of the State Great Khural /23.10.1997/	MNET, administration of the Aimag and capital, soum, district	Article 1.1.1. The purpose of this Law is to regulate the determination of Special Protected Area Buffer Zones and the activities therein.
The development policy, special fund, corruption and conflict of interest				
49	Law on Government Special Funds	Session of the State Great Khural /29.06.2006/	MF, MNET, administration of the Aimag and capital, soum, district	Article 12. Sources of the Environment protection fund financing consist of the following: 1. Fees for eco tourism licenses issued for protected areas; 2. Revenues as indicated in paragraph 4.2 of the Law on percentage and amount of royalty revenues to be expended on environment protection and natural resource rehabilitation activities. 3. Revenues from fees of water pollution 4. The compensation fees for damage caused to the environment and natural resources from individuals, entities and organizations. 5. Revenues from the sale of confiscated weapons and vehicles, transportation, machinery and equipment used to commit crimes and violations against the rules of environmental protection; 6. Law revenue from the sale of confiscated natural resources harvested illegally.
50	Law on Budget stability	Session of the State Great Khural /24.06.2010/	MF, other administration of the Aimag and capital, soum, district	Article 1. 1.1. The purpose of this law is to regulate relations concerning defining state rights and obligations in order to provide stability of integrated budget by determining and implementing, controlling the budget management principle and the budget special requirement, and building renewable resource by revenue from minerals, investing for promoting economic development and creating the financial savings.
51	Law on Development policy and planning	Session of the State Great Khural /26.11.2015/	The Government, ministries, administration of the Aimag and capital, soum, district	Article 1. 1.1. The purpose of this Law is to define the steps and underlying principles, stakeholder's rights and obligations for developing and implementing a Development Policy of Mongolia and carrying out monitoring and evaluation, and to build integrated framework of Development policy planning.
52	Law on Human development fund	Session of the State Great Khural /18.11.2009/	The Government, MF	Article 1. 1.1. The purpose of this law is to regulate relations concerning creating deposit from mineral sector's revenues and establishing development fund by forming permanent resource with steady increase, managing and spending the funds, reporting the performance, controlling.

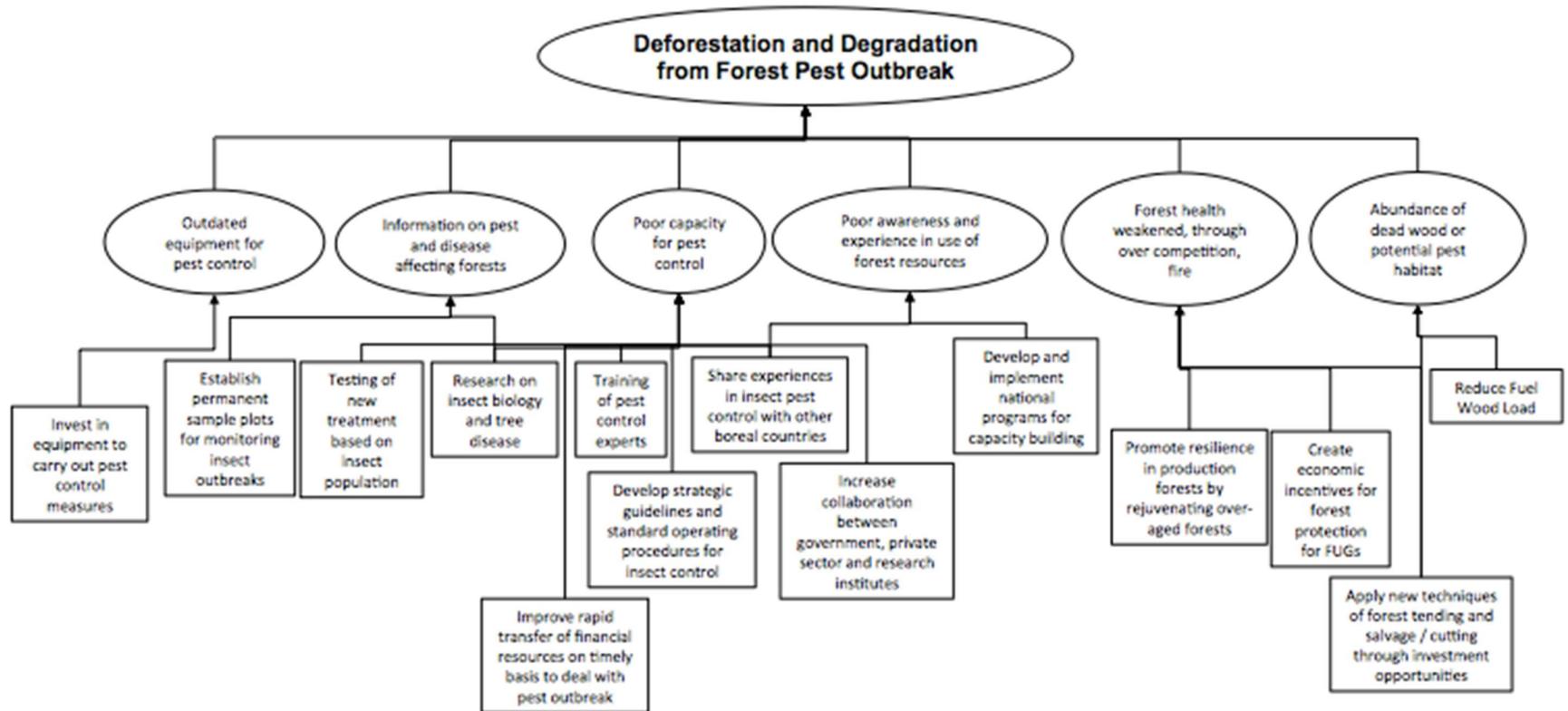
53	Law on Anti-Corruption	Session of the State Great Khural /07.06.2007/	The Government, ministries, IAAC, administration of the Aimag and capital, soum, district	Article 1. 1.1. The purpose of this Law is to define the legal basis for anticorruption activities and the anti-corruption body, and to regulate relations connected to them.
54	Law on Regulating Public and Private Interests in Public Service and Preventing Conflicts of Interest	Session of the State Great Khural /19.01.2012/	The Government, ministries, IAAC, CSC, administration of the Aimag and capital, soum, district	Article 1. The purpose of this law is to prevent conflicts of interest arising between the official duties and private interests of those in public service roles, and to regulate and monitor conflicts of interest in order to ensure that public service activities accord with the public interest and that transparency and faith in public services is maintained.

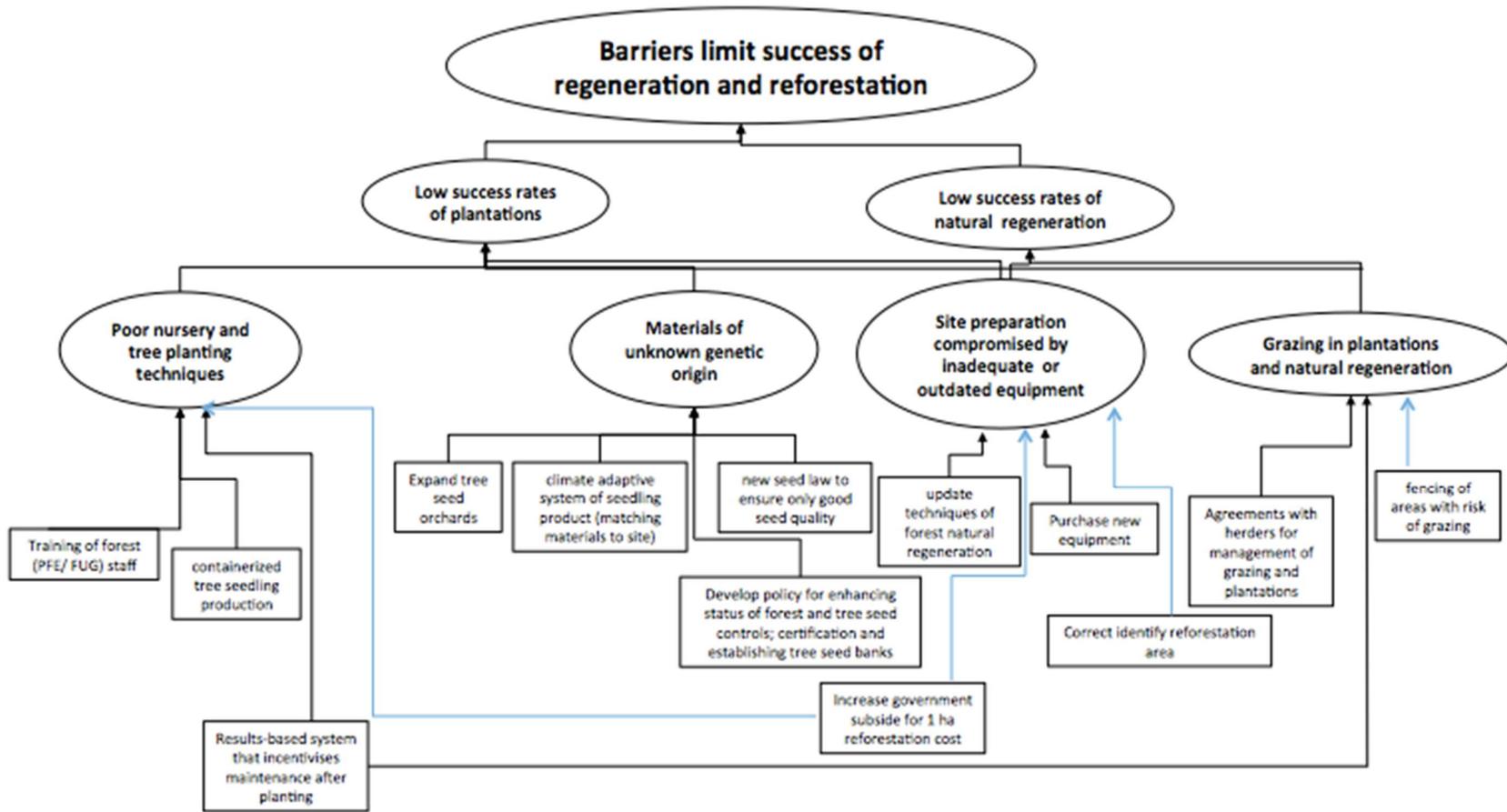
Annex 3. Problem trees with direct drivers, underlying drivers and associated PAMs













Annex 4. Methodology used illustrated by figures

Figure 1: Driver underlying driver and PAMs for each underlying driver

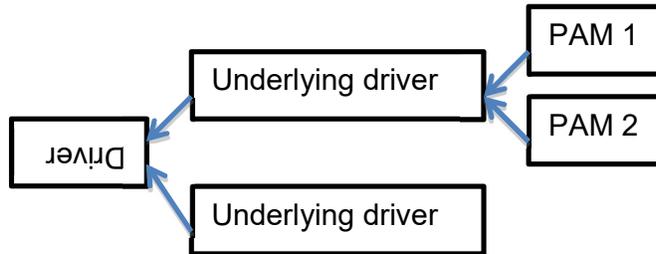


Figure 2: Weighting of three selection criteria by five groups (only weighting from one group is shown in the figure)

	Weight	Weight	Weight
Selection criteria 1	25 %		
Selection criteria 2	30 %		
Selection criteria 3	45 %		
	100 %		

Figure 3: Scoring of each PAM against the three criteria using a score 1 to 5 and calculating the average value by using the score from each workshop participant (In the figure only 4).

	PAM 1	PAM 1	PAM 1	PAM 1	Average
Selection criteria 1	3	2	4	5	3,5
Selection criteria 2	5	2	4	2	3,25
Selection criteria 3	2	4		4	3,5

Calculation for PAM 1: Average scoring multiplied with weight.

$\text{Score for PAM1: } 3,5 \times 25\% + 3,25 \times 30\% + 3,5 \times 45\% = 3,59$

A similar calculation was made for each of the 74 PAMs and for each underlying driver a list was made with number 1, 2, 3 etc. (see the workshop report).

This methodology combines a value preference (the weighting) with an assessment of the expected performance of each PAM (the scoring).

Finally a scoring of the feasibility was made using the score low, medium and high. In this case participants scored all PAMs for practical, financial and political feasibility.

	PAM 1	PAM 2	PAM 3	PAM 4
Practical feasibility	Medium	High		
Financial feasibility	Medium	Low		
Political feasibility	High	Low		

Annex 5. Agenda and list of participants of First consultation and validation workshop



БАЙГАЛЬ ОРЧИН,
АЯЛАЛ ЖУУЛЧЛАЛЫН ЯАМ

UN-REDD
PROGRAMME



Agenda

INITIAL SELECTION AND PRIORITIZATION OF POLICIES AND MEASURES FOR REDUCING EMISSIONS FROM DEFORESTATION AND DEGRADATION IN MONGOLIA

September 22-23, 2016

Aim of Workshop

To discuss selection and prioritisation of Policies and Measures for National REDD+ Strategy

Group Facilitators:

O.Bilguun, Ts.Khongor, L.Dorjtseden, D.Munkhзориг, B.Batchuluun

TIME	SESSION	PERSON
Sept 20, 2016 / Tuesday		
08:00	Depart from Ulaanbaatar	From Ministry of Environment and Tourism
10:00-10:15	Registration: Arrive at Khaan Jims Resort, Tsonjin boldog	PMU
10:15-10:30	Coffee tea break	PMU
10:30-10:35	Introduction and Welcome: Workshop Ground Rules	M.Tungalag, NPD, Head of DFPC
10:35-10:45	Brief Introduction of REDD+ and UN-REDD Mongolia National Programme	B.Khishigjargal, UN-REDD Mongolia National Programme
10:45-11:00	Introduction to REDD+: Examples from Asia	Tim Boyle, Regional Advisor of UN-REDD Programme
11:00-11:15	Current situation of forest resource, its protection and reforestation	Ts.Shiirevdamba, Adviser to the Minister
11:15-11:30	National REDD+ Strategy: Steps and Policies and Measures	Chris Dickinson, CTA, UN-REDD Mongolia National Programme
11:30-12:10	Review of Drivers of Deforestation and Degradation and Barriers for the Enhancement of Forest Carbon Stocks	National Consultants' Team
12:10-12:30	Question Time	
12:30-13:30	LUNCH	
13:30-14:00	Policies and Measure: Definition, Criteria and Selection Process	Peter Iversen, International Consultant

TIME	SESSION	PERSON
14:00-15:15	<p>Results Chains for Major Drivers: Group work for focus groups to map out the major issues Facilitated by NC and PMU</p> <p>5 Groups Topics:</p> <ol style="list-style-type: none"> 1. Fire 2. Pests 3. Poor forest management <ol style="list-style-type: none"> A. State and administrative level B. Company and FUG level 4. Barriers of forest restoration and rehabilitation 	NC and PMU
15:15-15:30	Coffee tea break	
15:30-15:45	Group Feedback	
15:45-17:00	<p>Discussion on Proposed Criteria: Identify and prioritize selection criteria for PAMs. Each group will assign weight for each criterion. The result of all input will be presented in one table.</p>	Peter Iversen and NC
17:00-18:15	Present candidate PAMs (a list of perhaps 40-50 PAMs)	NC and PMU
18:30	Dinner	PMU
Sept 21, 2016 / Wednesday		
08:30	Welcome day 2 and recap from Day 1	B.Khishigjargal, UN-REDD Mongolia National Programme
8:30-10:40	Present candidate PAMs and ask the groups to provide their score (1-5) on how the PAMs are expected to perform against the criteria.	Peter Iversen and NC
10:40-11:00	Coffee tea break	
11:00-12:30	Present table with the score for each candidate PAM from all groups and make the calculations that will produce a table with scoring times weight and produce a prioritized lists of PAMs	Peter Iversen and NC
12:30-13:30	Lunch	
13:30-14:00	Summary and Feedback: Next Steps in PAM Prioritisation	Peter & Chris
14:00-14:10	Closing Remarks	M.Tungalag, NPD, Head of DFPC Tim Boyle, Regional Advisor of UN-REDD Programme

List of Participants

No.	Name	Position and Organization	Contact details
Ministries representatives			
1	Ts.Shiirevdambe	Adviser to the Minister, MET	shiirevdamba@yahoo.com 99117608
2	M.Tungalag	Director of Department of Forest Policy and Coordination, MET and NPD, UN-REDD Mongolia National Programme	matungalag@yahoo.com
3	Ts.Banzragch	Senior Officer, Department of Forest Policy and Coordination, MET	uts_banzai@yahoo.com 9111-5345
4	B.Otgonsuren	Senior Officer, Department of Forest Policy and Coordination, MET	otgonsuren1962@yahoo.com 9912-5806
5	N.Enkhtaivan	Senior Officer, Department of Forest Policy and Coordination, MET	enkhtaivan_no@yahoo.com
6	Ch.Chuluunbaatar	Senior Officer, Department of Forest Policy and Coordination, MET	99137514 chuluunbaatar_ts@yahoo.com
7	I.Dorj	Officer Department of Forest Policy and Coordination, MET	dorj2009@gmail.com 9906-7493
8	D.Enkhjargal	Officer, Department of Forest Policy and Coordination, MET	tree_forest_tree@yahoo.com
9	D.Jagdag	Officer, Department of Forest Policy and Coordination, MET	jagdag_0301@yahoo.com 88080261
10	D.Tengis	Senior Officer, Department of Green Development & Strategic Planning, MET	99056724
11	E.Erdenekhuu	Forest Officer of Cadastre Division, MET	99248887 Erdenekhuu_e@yahoo.com
12	Choi-Ish	Director of Livestock policy Department, MoALI	
13	Mr.Tsogtbaatar	Senior officer of Department of Mining Policy, MoMining	264056 Албан бичиг илгээх
14	N.Ganibal	Director of Department of Livestock Husbandry Policy Implementation and Coordination	ganibal@mofa.gov.mn 262469
15	Ts.Bolorchuluun	Director of Department of Agriculture Policy Implementation and Coordination	bolorchuluun@mofa.gov.mn 262713
16	Z.Batjargal	National Focal Point UNFCCC, IPCC, GCF	zbatjargal@icc.mn 70000743, 99086786
Research institutions			
17	D.Munkhbat	Director of Forest Research and Development Centre (FRDC)	Munkhbat_do@yahoo.com 99112094
18	Kh.Michid	Head of Unit, Forest Research and Development Centre (FRDC)	96049441 michid_mgl21@yahoo.com
19	B.Ganzorig	Head of Unit, Forest Research and Development Centre (FRDC)	99799797 mglganzorig_0310@yahoo.com
20	Ch.Purevsuren	General Manager, Forest Research and Development Centre (FRDC)	88855910 Puje_anu@yahoo.com

21	N.Baatarbileg	Head and Prof. of Department of Forestry Study of Mongolian National University (NUM)	baatarbileg@num.edu.mn 9890-5686
22	B.Bayartsetseg	Director of Training and Research Institute of Forestry and Wood Industry, Mongolian University of Science & Technology	99903723 bayartsetseg@must.edu.mn
23	L.Natsagdorj	Consultant of Information and Research Institute of Meteorology, Hydrology and Environment	91157920 natsag03@yahoo.com
24	D.Tsendsuren	Forest researcher, Institute of Geography and Geoecology	93129979 dtsend2003@yahoo.com
25	Ch.Ganbaatar	Principal professor, team of Wood industry technology, Mongolian University of Science and Technology	99762926 ch_gan2000@yahoo.com
26	J.Bat-Erdene	Head of Department, University of Life Science	99239654
27	Z.Narangerel	EIC, Institute of Meteorology	znarangerel@yahoo.com 99993132
28	Gombolhuudev	Head of Climate change unit, Institute of Meteorology	Pgombo@hotmail.com 99256992
29	M.Undraa	Institution of General & Experimental Biology	zuunnast@gmail.com 99960257
International projects			
30	Klaus Schmidt-Corsitto	Director of Programme "Biodiversity and Adaptation of Key Forest Ecosystems to Climate Change"	klaus.schmidt-corsitto@giz.de 312282, 9999-0321
31	Dan Altrell	Project on REDD+ Compatible NFI	altrell@sajt.se
32	Andrew Inglis	FAO/GEF Project Chief Technical Advisor	Andrew.Inglis@fao.org 9960-2254
33	Ts.Solongo	FAO/GEF National Project Coordinator	Solongo.Tsevegmid@fao.org 99192187
34	D.Enkhsaikhan	FAO-GEF Project	denkhsaikhan@yahoo.com 99872677
35	J.Tsogtbaatar	ADB project	99118203
36	B.Enkhtsetseg	Biodiversity and Adaptation to Climate Change project, KfW	batochir@gmx.de 86005777
Local representatives			
37	G.Tsengelzaya	Head of Forest unit, Department of Environment and Tourism, Selenge province	99499474
38	P.Enkhbayar	Forest Officer, Department of Environment and Tourism, Tuv province	eb_0617@yahoo.com 99596945
39	Otgonbat	Head of Tsagaan burgas FUG, Tumurbulag soum, Khuvsgul province	88535317 puujee228@yahoo.com
40	Mandakhsan	Head of Forest Unit, Khutag Undur soum, Bulgan province	
41	D.Galkhuu	Head of Forest Unit, Tsenkher soum, Arkhangai province	dorjsuren.galkhuu@yahoo.com 98009995
42	D.Batbold	Umnudelger soum, Head of Community Association, Khentii province	batbolddashdende@gmail.com

			98998814
Consultants			
43	Ch.Dorjsuren	Member of national consultants team	chdorj_07@yahoo.com 9917-8887
44	L.Dorjtseden	Member of national consultants team, UN-REDD Mongolia National Programme	dorjtsedenl5@yahoo.com
45	D.Munkhзориг	Member of national consultants team, UN-REDD Mongolia National Programme	Munkhзориг.d@gmail.com 88119501
46	B.Oyunsanaa	Member of national consultants team, UN-REDD Mongolia National Programme	oyunsanaa@seas.num.edu.mn 99081104
47	Peter Iverson	International Consultant on PAMs, UN-REDD Mongolia National Programme	peteraai@yahoo.com
UNDP / Programme Management Unit			
48	Kh.Khishigjargal	Programme analyst, UNDP Mongolia	khishigjargal.kharkhuu@undp.org ; 327585
49	B.Khishigjargal	Manager, UN-REDD Mongolia National Programme	jagaa.b@gmail.com 99020722
50	Chris Dickinson	CTA UN-REDD Mongolia National Programme	
51	O.Bilguun	UN-REDD Mongolia Programme Coordinator	bilguuno@unredd.mn
52	Richard Metcalfe	International Consultant, UN-REDD Mongolia National Programme	
53	Ts.Khongor	National Consultant, UN-REDD Mongolia National Programme	99280129
54	B.Batchuluun	Communication officer, UN-REDD Mongolia National Programme	
55	B.Narantsatsral	Finance officer, UN-REDD Mongolia National Programme	96077771
NGO / Civil Society Organizations			
56	B.Erdene	Mongolian Environmental Civil Council NGO	99992097 Erdene.bz@yahoo.com
57	A.Enkh-Amgalan	Director, Center for Policy Research NGO	70117044 cpr@cpr.mn
58	D.Batbold	Director, WWF Mongolia	batbold@wwf.panda.org 99041022
59	Ch.Maamuu	Executive director, Foresters & Woodworking Manufacturers Association of Mongolia	maamuu@fwma.mn 99117338
60	Ch.Gendentsamts	General manger, Foresters & Woodworking Manufacturers Association of Mongolia	momueh@yahoo.com 99048137

**DISCUSSION AND VALIDATION OF POLICIES AND MEASURES FOR REDUCING
EMISSIONS FROM DEFORESTATION AND DEGRADATION IN MONGOLIA**

Agenda

05th December, 2016

Aim of Workshop

Discussion and validation of Initial Policies and Measures for National REDD+ Strategy

TIME	SESSION	PERSON
Sept 22, 2016 / Thursday		
9:30-09:40	Introduction and Welcome	M.Tungalag, NPD, Head of DFPC
09:40-10:00	Quick introduction of participants and purpose of the workshop	B.Khishigjargal, Manager, UN-REDD Mongolia National Programme
10.00-10.20	National REDD+ Strategy development	Chris Dickinson, CTA, UN-REDD Mongolia National Programme
10:20-11:10	First set of PAM followed by discussion (Enabling PAMs)	International and national consultants team
11:10-11:30	Coffee break	
11:30-12:30	Second set of PAMs followed by discussion (FUG and PFE)	International and national consultants team
12:30-13:30	LUNCH	
13:30-14:10	Third set of PAMs followed by discussion (Fire and Pest)	International and national consultants team
14:10- 15:00	Fourth set of PAMs followed by discussion (Tree planting)	International and national consultants team
15:00-15:20	Coffee break	
15:20-16:20	Discussion and validation of Initial PAMs by group work	International and national consultants team
16:20-16:50	Each team will represent the results	Team representative
16:50-17:00	Summary	International and national consultants team

List of participants

No.	Name	Position and Organization	Contact details
Ministries representatives			
1	M.Tungalag	Director of Department of Forest Policy and Coordination, MET and NPD, UN-REDD Mongolia National Programme	matungalag@yahoo.com
2	Ts.Banzragch	Senior Officer, Department of Forest Policy and Coordination, MET	uts_banzai@yahoo.com 9111-5345
3	B.Otgonsuren	Senior Officer, Department of Forest Policy and Coordination, MET	otgonsuren1962@yahoo.com 99125806
4	N.Enkhtaivan	Senior Officer, Department of Forest Policy and Coordination, MET	enkhtaivan_no@yahoo.com 98111581
5	Ch.Chuluunbaatar	Senior Officer, Department of Forest Policy and Coordination, MET	99137514 chuluunbaatar_ts@yahoo.com
6	D.Enkhjargal	Officer, Department of Forest Policy and Coordination, MET	tree_forest_tree@yahoo.com
7	D.Jagdag	Officer, Department of Forest Policy and Coordination, MET	jagdag_0301@yahoo.com 88080261
8	R.Ganbat	Officer, Department of Forest Policy and Coordination, MET	forest_ganbat@yahoo.com
9	D.Tengis	Senior Officer, Department of Green Development & Strategic Planning, MET	99056724
10	D.Enkhbayar	Модо модон эдлэлийн үйлдвэрлэл хариуцсан мэргэжилтэн, Бодлого зохицуулалтын газар, ХХААХҮЯ	Enkhbayar6516@gmail.com 96666516
11	Z.Batjargal	National Focal Point UNFCCC, IPCC, GCF	zbatjargal@icc.mn 70000743, 99086786
12	S.Galtzul	Officer, NEMA	93054143, 263551.
13	D.Altangerel	NEMA	88115780
14	N.Byambadorj	Officer, Dep. of Livestock Policy, MoFALI	byambadorj@mofa.gov.mn 263247, 91009921 nbdorj@yahoo.com
15	E.Dulguun	Officer, Dep. of Depth & Development Funding, MoF	dulguun_e@mof.gov.mn ; 99183308
Research institutions			
16	D.Munkhbat	Director of Forest Research and Development Centre (FRDC)	Munkhbat_do@yahoo.com 99112094
17	Ch.Purevsuren	General Manager, Forest Research and Development Centre (FRDC)	88855910 Puje_anu@yahoo.com
18	N.Baatarbileg	Head and Prof. of Department of Forestry Study of Mongolian National University (NUM)	baatarbileg@num.edu.mn 9890-5686
19	N.Batkhuu	NUM	
20	B.Bayartsetseg	Director of Training and Research Institute of Forestry and Wood Industry, Mongolian University of Science & Technology	99903723 bayartsetseg@must.edu.mn
21	Z.Narangerel	EIC, Institute of Meteorology	znarangerel@yahoo.com 99993132
22	M.Undraa	Institution of General & Experimental Biology	zuunnast@gmail.com 99960257
23	D.Enkhsaikhan	Мэргэжлийн сургалт, үйлдвэрлэлийн сургуулийн багш	denkhsaihan@yahoo.com 9987 2677

24	Ch.Ganbaatar	MUST	ch_gan2000@yahoo.com 99762926
25	Z.Tsogt	Institute of Experimental & General Biology	99732622
26	N.Elbegjargal	GIS expert, Institute of Meteorology	n_elbegjargal@yahoo.com 88779989
27	B.Dondov	Professor, Institute of Plant Protection and Research	
International projects			
28	Klaus Schmidt-Corsitto	Director of Programme "Biodiversity and Adaptation of Key Forest Ecosystems to Climate Change"	klaus.schmidt-corsitto@giz.de 312282, 9999-0321
29	Dan Altrell	Project on REDD+ Compatible NFI	altrell@sajt.se
30	E.Erdenebat	Project on REDD+ Compatible NFI	Erdenjav.erdenebat@giz.de 312282
31	Andrew Inglis	FAO/GEF Project Chief Technical Advisor	Andrew.Inglis@fao.org 9960-2254
32	Ts.Solongo	FAO/GEF National Project Coordinator	Solongo.Tsevegmid@fao.org 99192187
33	Kristina Soennichsen	MSFM NGO advisor	kristina.soennichsen@gmail.com 94329464
34	J.Tsogtbaatar	National Consultant, ADB TA 8874 project	tsogtbaatar2014@gmail.com
35	Hans Hoffmann	Team leader, ADB TA 8874 project	hhoffm5563@aol.com
Local representatives			
36	G.Tsengelzaya	Head of Forest unit, Department of Environment and Tourism, Selenge province	99499474 zaya_64@yahoo.com
37	P.Enkhbayar	Forest Officer, Department of Environment and Tourism, Tuv province	eb_0617@yahoo.com 99596945
38	D.Otgonbat	Head of Tsagaanburgas FUG, Tumurbulagsoum, Khuvsgul province	88535317 puujee228@yahoo.com
39	B.Mandakhsan	Head of Forest Unit, KhutagUndursoum, Bulgan province	do_mandahsan@yahoo.com 95551491
40	D.Galkhuu	Head of Forest Unit, Tsenkhersoum, Arkhangai province	dorjsuren.galkhuu@yahoo.com 98009995
Consultants			
41	Ch.Dorjsuren	Member of national consultants team	chdorj_07@yahoo.com 9917-8887
42	L.Dorjtseden	Member of national consultants team, UN-REDD Mongolia National Programme	dorjtseden15@yahoo.com
43	D.Munkhзориг	Member of national consultants team, UN-REDD Mongolia National Programme	Munkhзориг.d@gmail.com 88119501
44	Peter Iverson	International Consultant on PAMs, UN-REDD Mongolia National Programme	peteraai@yahoo.com
UNDP/ Programme Management Unit			
45	Timothy Boyle	Regional Advisor, UN-REDD Programme	timothy.boyle@undp.org
46	Kh.Khishigjargal	UNDP	

47	B.Khishigjargal	Manager, UN-REDD Mongolia National Programme	jagaa.b@gmail.com 99020722
48	Chris Dickinson	CTA UN-REDD Mongolia National Programme	
49	O.Bilguun	UN-REDD Mongolia Programme Coordinator	bilguuno@unredd.mn
50	Ts.Khongor	National Consultant, UN-REDD Mongolia National Programme	99280129
51	B.Batchuluun	Communication officer, UN-REDD Mongolia National Programme	97115599
52	B.Narantsatsral	Finance officer, UN-REDD Mongolia National Programme	96077771
NGO / Civil Society Organizations			
53	B.Baasanbyamba	Head, Foresters & Woodworking Manufacturers Association of Mongolia	99065094
54	Ch.Maamuu	Executive director, Foresters & Woodworking Manufacturers Association of Mongolia	maamuu@fwma.mn 99117338
55	B.Gerel	Mon-Taxation LLC	93173685
56	N.Erdensaikhan	Environment safety center NGO	99114157 erdene@environ.mn
57	B.Javkhlantugs	Grand Forest LLC	99123322 javxlantugs_b@yahoo.com
58	U.Bolor	FDRCLLC	ulziidashbolor@yahoo.com 99179688
59	B.Bayarsaikhan	Khuvchiinkhoimor LLC	khuvch@yahoo.com 91912965
60	S.Dashdavaa	Tugul LLC	99886064
61	G.Luvsantseren	Head, Mongolian United Foresters' Association	99160082
62	J.Natsagdorj	Head, FUG Association	khaan_mongolei@yahoo.de 99192116

Annex 6. Result of the weighted scoring for each underlying driver

Underlying driver: Rural unemployment and poverty – illegal sourcing of wood	Шууд бус хүчин зүйл: Ядуурал/ажилгүйдэл-хууль бус мод бэлтгэл	Weighted score	Number
Rejuvenate older stands to improve forest vitality (shelter wood thinning). This both as a mean to increase forest income, create jobs, rejuvenate stands and promote climate change adaptation.	Нас гүйцсэн, хөгширсөн ойд тохируулах огтлолтыг хийнэ. Энэ нь ойгоос олох орлого, ажлын байрыг нэмэгдүүлэх бөгөөд залуу моддын өсөлтийг сайжруулна.	17,21	4
Re-establish old forest roads and construct new forest roads in collaboration with concession holders as a mean to facilitate increased thinning and rejuvenation of stands.	Хуучин ойн замуудыг сэргээх болон шинээр ойн зам барьж ойн аж ахуйн үйл ажиллагааг эрчимжүүлэх.	16,67	5
Create new job places in the field of forest salvaging and sanitation cuttings and wood extraction work by supporting through low interest rate loan system for small and medium sized forest entities and forest user groups.	Ойн цэвэрлэгээний ажлын хүрээнд үйлдвэрлэл, үйлчилгээ эрхлэх иргэд, ойн мэргэжлийн байгууллага, нөхөрлөлүүд, жижиг аж ахуйн нэгжийг хөнгөлөлттэй зээл, зээлийн хүүгийн хөнгөлөлтөөр дэмжин орон нутагт ажлын байр бий болгоно..	17,21	4
Provide government support for establishing entities, incubator centers and small and medium-sized enterprises with advanced technologies that develop, introduce and transfer advanced techniques for afforestation, restoration, forest conservation and timber use alongside research organizations, universities and higher education institutes.	Эрдэм шинжилгээний байгууллага, их, дээд сургуулийн дэргэд ойжуулалт, нөхөн сэргээлт, ой хамгаалал, мод ашиглах, боловсруулах үйлдвэрлэлийн дэвшилтэт технологи болвсруулах, нэвтэрүүлэх, дамжуулах нэгж, инкубаторийн төв, өндөр технологийн жижиг, дунд үйлдвэр байгуулахыг төрөөс дэмжих	19,28	2
Promote local enterprises to add value to forest products and create jobs by processing of non-timber forest products: medicinal plants; nuts and berries, mushrooms basing their sustaining resources.	Ойн дагалт баялгийн ашиглан нэмүү өртөг шингэсэн бүтээгдэхүүн үйлдвэрлэж, ажлын байр нэмэгдүүлэхийг дэмжих	18,00	3
Review policy and develop guidelines for improved forest law enforcement.	Ойн талаар баримтлах бодлого, эрх зүйн шинэчлэлт хийх	20,24	1
Underlying driver: Ineffective licensing/ low incentives for FUGS & PFES.	Шууд бус хүчин зүйл: Ойн санг гэрээгээр эзэмшигчидийн эрх, урамшуулал хангалттай бус		

Assess performance-based activities of forest concession entities and FUGs and deliver future guidance for their forest activities.	Ойн санг эзэмшигчдийн үйл ажиллагаанд үнэлэлт өгч, цаашид хэрэгжүүлэх үйл ажиллагааны зөвлөмж гаргана	18,83	2
Train and allow FUG to do pre-commercial thinning.	Нөхөрлөлүүдийг арчилгааны огтлолт хийх чадвар, эрхтэй болгох.	17,16	3
Create economic incentives for forest protection for FUG and establish new system for distribution and re-distribution of forest resource use fees for forest protection and management	Ойн нөхөрлөлүүдийн эдийн засгийн урамшууллын тогтолцоо, байгалийн нөөц ашигласны төлбөрийн хуваарилалт, дахин хуваарилалтын систем бий болгох	19,27	1
Underlying driver: Poor institutional capacity.	Хүчин зүйл: Салбарын байгууллагын чадавхи, тогтолцоо сул		
Promote staffing at all level of forest institutions.	Бүх шатанд ойн мэргэжлийн ажилчдын орон тоог нэмэгдүүлэх	20,12	1
Create new jobs in forest sanitation cuttings through low interest rate loan system for SMEs and FUGs.	Ойн цэвэрлэгээний ажлын хүрээнд үйлдвэрлэл, үйлчилгээ эрхлэх иргэд, ойн мэргэжлийн байгууллага, нөхөрлөлүүд, жижиг аж ахуйн нэгжийг хөнгөлөлттэй зээл, зээлийн хүүгийн хөнгөлөлтөөр дэмжин орон нутагт ажлын байр бий болгоно.	17,73	2
Underlying driver: Low cutting volumes incentivizing illegal logging.	Хүчин зүйл: Бэлтгэх модны дээд хязгаар хэт бага байгаа нь хууль бус мод бэлтгэлийг нэмэгдүүлж байна		
Create new jobs in forest sanitation cuttings through low interest rate loan system for SMEs and FUGs.	Ойн цэвэрлэгээний ажлын хүрээнд үйлдвэрлэл, үйлчилгээ эрхлэх иргэд, ойн мэргэжлийн байгууллага, нөхөрлөлүүд, жижиг аж ахуйн нэгжийг хөнгөлөлттэй зээл, зээлийн хүүгийн хөнгөлөлтөөр дэмжин орон нутагт ажлын байр бий болгоно	17,48	2
Review policy and develop guidelines for improved forest law enforcement.	Ойн талаар баримтлах бодлого, эрх зүйн шинэчлэлт хийх	20,22	1
Create new job places in the field of forest salvaging and sanitation cuttings and wood extraction work by supporting through low interest rate loan system for small and medium sized forest entities and forest user groups.	Ойн цэвэрлэгээний ажлын хүрээнд үйлдвэрлэл, үйлчилгээ эрхлэх иргэд, ойн мэргэжлийн байгууллага, нөхөрлөлүүд, жижиг аж ахуйн нэгжийг хөнгөлөлттэй зээл, зээлийн хүүгийн хөнгөлөлтөөр дэмжин орон нутагт ажлын байр бий болгоно	17,31	3
Underlying driver: Insufficient funding for sustainable forest management.	Хүчин зүйл: Хангалтгүй санхүүжилт, Төсвөөс хараат байдал		
Implement sustainable ecotourism spilt with communities and private sector	Тогтвортой эко аялал жуулчлалыг Ой бүхий газар нутгуудад хувийн	18,68	5

in buffer zones of key forest areas.	хэвшил, нутгийн иргэдийн оролцоотойгоор хөгжүүлнэ		
Long term and timely harvest allocations for PFEs.	Ойн санг эзэмшигч аж ахуйн нэгжид ОМТ-ний дагуу урт хугацаанд тогтвортой үйл ажиллагаа явуулах, хөрөнгө оруулалт татах боломжийг бий болгох	19,00	2
Promote green economy through taxation policy and ecosystem services fee.	Ногоон эдийн засгийн дэмжсэн татварын бодлого, эрх зүйн орчныг бий болгоно.	19,00	2
Promote local enterprises to add value to forest products and create jobs by processing of non-timber forest products: medicinal plants; nuts and berries, mushrooms basing their sustaining resources	Ойн хөрс, ус болон биологийн олон янз байдлыг хамгаалах зэрэг экологийн ач холбогдлыг үнэлсэн экосистемийн үйлчилгээний төлбөрийг бий болгон мөрдөх	17,07	4
Extend work area and responsibility of current inter Soum Forest units to Forestry such a self financing forest silvicultural activity and non timber product processing	Одоогийн ойн ангийг Ойн АА болгон өөрчлөх, өөрөө өөрийгөө санхүүжүүлэх, үйлдвэрлэл явуулах боломжтой болгох	20,30	6
Create vertical forest institutional structure at local level	Анхан болон дунд шатны Ойн байгууллагыг босоо бүтцэд оруулах	18,74	4
Underlying driver: Poor awareness and experience in use of forest resources	Хүчин зүйл: Ойн нөөцийг иж бүрэн ашиглах туршлага, мэдлэг сул		
Train and allow FUG to do pre-commercial thinning.	Нөхөрлөлүүдийг арчилгааны огтлолт хийх чадвар, эрхтэй болгох.	17,92	3
Promote staffing in forest management and practices in all level of forest institutions.	Бүх шатанд ойн мэргэжлийн ажилчдын орон тоог нэмэгдүүлэх	20,26	1
Improve public education.	Олон нийтийн мэдлэгийг дээшлүүлэх	19,80	2
Underlying driver: Perception of forests as a public good of low value.	Хүчин зүйл: Perception of forests as a public good of low value.		
Establish a system that promotes green economy.	Ногоон эдийн засгийг дэмжсэн тогтолцоог бүрдүүлэх	19,84	3
Establish and enforce payments for ecosystem services.	Экосистемийн үйлчилгээний төлбөрийг бий болгон мөрдөх	19,56	4
Expanding/strengthening the protected areas system.	УТХГН-ын сүлжээг өргөтгөх/бэхжүүлэх	18,01	5
Implement law on Payment of Natural Resources Use	БОНБАТ тухай хуулийг хэрэгжүүлэх	20,17	1
Increase inter Ministerial cooperation	Яамд хоорондын хамтын ажиллагаа, ажлын уялдааг сайжруулах	20,12	2

Underlying driver: Barriers for business development for Private Forests Enterprises.	Хүчин зүйл: Ойн салбарын аж ахуйн нэгжүүдийн хөрөнгө оруулалт, бизнесийн хязгаарлагдмал нөхцөл		
Provide long term and timely harvest allocations for forest companies to improve their ability to plan and make investments.	Ойн санг эзэмшигч аж ахуйн нэгжид ОМТ-ний дагуу урт хугацаанд тогтвортой үйл ажиллагаа явуулах, хөрөнгө оруулалт татах боломжийг бий болгох.	19,07	2
Re-establish old forest roads and construct new forest roads in collaboration with concession holders as a mean to facilitate increased thinning and rejuvenation of stands	Хуучин ойн замуудыг сэргээх болон шинээр ойн зам барьж ойн аж ахуйн үйл ажиллагааг эрчимжүүлэх.	17,90	5
Create new job places in the field of forest salvaging and sanitation cuttings and wood extraction work by supporting through low interest rate loan system for small and medium sized forest entities and forest user groups.	Ойн цэвэрлэгээний ажлын хүрээнд үйлдвэрлэл, үйлчилгээ эрхлэх иргэд, ойн мэргэжлийн байгууллага, нөхөрлөлүүд, жижиг аж ахуйн нэгжийг хөнгөлөлттэй зээл, зээлийн хүүгийн хөнгөлөлтөөр дэмжин орон нутагт ажлын байр бий болгоно	18,33	4
Forest professional NGO should be in charge of issuing forest professional certificates for companies.	Ойн мэргэжлийн байгууллагын эрх олгох асуудлыг Мэргэжлийн төрийн бус байгууллагаар гүйцэтгүүлэх	18,42	3
Allocate harvest permission for a ten year period in accordance with 10 years forest management plan.	ОМТ-г 10 жилээр баталдаг болох	20,72	1
Underlying driver: Weak law enforcement.	Хүчин зүйл: Хуулийн хэрэгжилт сул		
Review policy and develop guidelines for improved forests law enforcement.	Ойн талаар баримтлах бодлого, эрх зүйн шинэчлэлт хийх	19,99	2
Increase inter Ministerial cooperation.	Яамд хоорондын хамтын ажиллагаа, ажлын уялдааг сайжруулах	20,12	1
Direct driver: Forest fire	Шууд хүчин зүйл: Ойн түймэр		
Underlying driver: Fire not viewed as an issue.	Underlying driver: Ойн түймэрт хайхрамжгүй ханддаг		
Launch awareness campaign on the risk of forest fire and the consequences.	Түймрийн эрсдэл, хор хөнөөлийн талаар сургалт, сурталчилгаа явуулах.	22,33	1
Increase awareness by including forest, environment and climate change in school curriculum.	Байгаль орчин, түймэр, уур амьсгалын өөрчлөлтийн талаар дунд сургуулийн сургалтын хөтөлбөрт оруулах.	18,76	2
Underlying driver: Failure to prevent forest fire	Шууд бус хүчин зүйлүүд: Ойн түмрээс урьдчилан сэргийлэх ажил хангалтгүй		
Train local community in efforts to reduce forest fire, use local community champions to train other communities.	Нутгийн иргэдийн түймэртэй тэмцэх чадавхийг нэмэгдүүлэх, сургалтад хамруулах	23,70	1

Take prevention actions against forest fires by creating fire break strips in forest- steppe boundary in high risk areas.	Улсын хилийн бүс, шаардлагатай газруудад түймрийн эсрэг шороон зурвас татах, зам, ойн зааг гаргах ажлыг зохион байгуулах зэргээр түймрийн тархалтаас сэргийлэх арга хэмжээг авах	21,02	4
Promote networking in trans-boundary fire information exchanges among neighbours and create agreements on forest fire prevention and extinguishment at the level of Governments of neighbouring countries.	Хил дамжсан түймрээс сэргийлэх, түүнтэй тэмцэх талаар хөрш орнуудтай Засгийн газар хооронд гэрээ байгуулах, байгуулсан гэрээг хэрэгжүүлэх, хил дамнан гарч байгаа түймрийн мэдээллийн сүлжээг сайжруулах.	22,13	2
Penalties for causing forest fire	Түймэр алдсаны хариуцлага тооцох арга хэмжээг чангатгах	21,23	3
Install lightening prevention system in key forest area	Аянга зайлуулагч тавих	18,78	5
Underlying driver: Failure to control forest fire	Шууд бус хүчин зүйл: Түймэрт тавих хяналт сул		
Create forest fire fighting units/stations in Department of Emergency at aimag and soum level; and provide support from the state in supplying necessary equipment for combating forest fires with promotion of capacity of forest fire fighting and preventing activities.	Ойн түймрээс сэргийлэх, түймэртэй тэмцэх ажлын материаллаг баазыг бэхжүүлж, аймгийн онцгой байдлын газар, сумын ойн асуудал хариуцсан нэгжийн дэргэд ой, хээрийн түймэр унтраах хэсэг (станц) байгуулж гал унтраах машин, тоног төхөөрөмж хэрэгсэл, бодисоор хангаж төсвөөс санхүүжүүлэх.	20,79	5
Monitor implementation of planed activities for forest fire prevention and extinguishing at aimag, cities and soums and promote legal and financing incentives for forest fire management.	Ойн түймрээс сэргийлэх, түймэртэй тэмцэх талаар аймаг, нийслэл, сумын төлөвлөгөөнд тусгагдсан ажлын биелэлтийг жил бүр дүгнэж, түймрийн менежментэд эрх зүйн болон санхүүгийн урамшуулал үзүүлэх	20,61	6
Promote networking in trans-boundary fire information exchanges among neighbours and create agreements on forest fire prevention and extinguishment at the level of Governments of neighbouring countries.	Хил дамжсан түймрээс сэргийлэх, түүнтэй тэмцэх талаар хөрш орнуудтай Засгийн газар хооронд гэрээ байгуулах, байгуулсан гэрээг хэрэгжүүлэх, хил дамнан гарч байгаа түймрийн мэдээллийн сүлжээг сайжруулах.	21,73	2
Re-establish old forest roads or establish new forest roads with a view to improve access to forest areas.	Хуучин ойн замуудыг сэргээх болон шинээр ойн зам барьж ойн гүнд нэвтрэх боломжийг сайжруулах	19,23	7
Invest in forest fire equipment.	Түймэртэй тэмцэх тоног төхөөрөмжөөр хангах	20,83	4
Take actions for rapid detection and extinguish of fires through remote sensing monitoring and	Зайнаас тандан судлах, агаарын болон газрын эргүүл гаргах замаар ойн түймрийг шуурхай илрүүлж, тэмцэх, арга хэмжээ авах	22,33	1

improve information dissemination.			
Establish new financial incentives for operational detection and extinguish activities of forest fire prevention by organizing forest fire extinguishing voluntary groups and mobilizing seasonally operating patrols at aimags and soums of forest areas.	Ой бүхий аймаг, сумдад улирлын урамшуулалттай түймрийн эргүүл гаргах, түймэр унтраах сайн дурын бүлэг зохион байгуулах замаар түймрийг шуурхай илрүүлэх, тэнд ажилласан хүмүүст санхүүгийн урамшуулал үзүүлэх механизм бүрдүүлэх	20,95	3
Underlying driver: High fuel load in forests	Шууд бус хүчин зүйл: Ойд шатах материалын нөөц хэт их		
Re-establish old forest roads or establish new forest roads with a view to improve access to forest areas and reduce fuel load.	Хуучин ойн замуудыг сэргээх болон шинээр ойн зам барьж ойн гүнд нэвтрэх боломжийг сайжруулах.	19,87	2
Implement forest cleaning to reduce fuel loads.	Ойн цэвэрлэгээ хийж шатах нөөцийг бууруулах	20,20	1
Direct driver: Forest pest outbreak	Шууд хүчин зүйл: Ойн хөнөөлт шавьж, өвчин		
Underlying driver: Forest health weakened due to dense stands and fire	Шууд бус хүчин зүйл: Түймэр болон хөгшрөлтөөс ойн эрүүл байдал доройтсон		
Apply new techniques of forest tending and salvaging/sanitation cuttings through investment opportunities and investment loan and other different financial sources.	Хөрөнгө оруулалт, хөрөнгийн зээл болон бусад эх үүсвэрээс хөнгөлттэй нөхцөлтэйгөөр ойн арчилгаа, цэвэрлэгээний ажилд орчин үеийн техник, технологийг нэвтрүүлнэ.	19,55	2
Promote resilience in production forests by rejuvenating over-aged forests.	Нас гүйцсэн, хөгшин модыг ашиглаж ойн бүтээмжийг нэмэгдүүлэх	20,18	1
Underlying driver: Abundance of dead wood - habitat for pest and diseases	Шууд бус хүчин зүйл: Унанги хатсан модны хэмжээ нэмэгдсэнээс хөнөөлт шавж, өвчин нэмэгдэх нөхцлийг бүрдүүлж байна		
Create incentives for FUG for forest protection	Ойг цэвэрлэгээний ажил гүйцэтгэсэн нөхөрлөлүүдийг урамшуулах	22,02	1
Promote resilience in production forests by rejuvenating over-aged forests.	Нас гүйцсэн, хөгшин модыг ашиглаж ойн бүтээмжийг нэмэгдүүлэх	20,17	2
Underlying driver: Poor awareness and experience in use of forest resources and sustainable forest management	а) Шууд бус хүчин зүйл: Ойн нөөцийг иж бүрэн ашиглах туршлага, мэдлэг сул		
Develop and implement national programs for capacity building.	Мэдлэг, чадавхийг дээшлүүлэх үндэсний хөтөлбөр боловсруулж хэрэгжүүлэх.	20,21	2

Share experiences in insect population control and tree diseases with other countries with boreal forests	Хөнөөлт шавж, өвчинтэй тэмцэх арга зүйн талаар бусад орны туршлагыг судлах, хэрэгжүүлэх арга хэмжээ авч эхлэх	20,20	3
Increase collaboration between government, private sector and research institutes on forest pest management.	Төр, хувийн хэвшил, судалгааны байгууллага хоорондын ажлын уялдаа холбоог сайжруулах	19,19	5
Make it more attractive to be forest professional	Ойн мэргэжлийн ажилчдын цалин хангамжийг нэмэгдүүлэх, нийгмийн арга хэмжээ авах	20,31	1
Introduce National forest certification system comply with International Certification system	Үндэсний Ойн магадлан итгэмжлэлийг нэвтрүүлэх, улмаар олон улсын магадлан итгэмжлэлд нэгдэх	19,67	4
Underlying driver: Poor capacity for pest control	Шууд бус хүчин зүйл: Хөнөөлт шавжинд тавих хяналт, чадавхи сул		
Develop strategic guidelines and standard operating procedures for insect control.	Хөнөөлт шавж, өвчнийг хянах стратеги, заавар боловсруулах.	20,80	2
Increase collaboration between government, private sector and research institutes on forest pest management.	Төр, хувийн хэвшил, судалгааны байгууллага хоорондын ажлын уялдаа холбоог сайжруулах	19,75	4
Improve rapid transfer of financial resources on timely basis to deal with pest outbreak.	Хөнөөлт шавжийн хэт олшролын үед шуурхай зарцуулах сан бий болгох	20,87	1
Training and education of experts on forests pests.	Ойн хөнөөлт шавж, өвчний чиглэлээр мэргэшсэн мэргэжилтэн бэлтгэнэ	20,77	3
Underlying driver: Information on pest and diseases affecting forests	Шууд бус хүчин зүйл: хөнөөлт шавж, өвчинд нэрвэгдсэн ойн судалгаа, мэдээлэл		
Establish permanent monitoring plots on forest insect outbreaks and insect population dynamics based in forest vegetation zones.	Ойн хөнөөлт шавжийн хэт олшролын хөдлөл зүйд ажиглалт судалгаа явуулах суурин цэгүүдийг бүс нутгийн ойн хэв шинж тус бүрд байгуулах	19,53	1
Research on insect biology and tree diseases affecting forests and establish thresholds for active intervention.	Тэмцлийн ажил гүйцэтгэх шаардлага, босго шалгуурыг оновчтой тогтоох арга зүйг боловсруулах	18,84	2
Underlying driver: Out-dated equipment for pest control	Шууд бус хүчин зүйл: Хөнөөлт шавжтай тэмцэх багаж тоног төхөөрөмж хуучирсан		
Invest in equipment to carry out pest control measures.	Хөнөөлт шавжтай тэмцэх багаж тоног төхөөрөмжөөр хангах	20,74	1
Investigate the feasibility for domestic production of biological substance to control pest outbreaks.	Цэмцлийн ажилд дотоодын био бэлдмэлийг ашиглах.	20,07	2
Establish production lab-station for biological substances for the fighting ageing's forest insect.	Хөнөөлт шавжтай тэмцэх биобэлдмэл үйлдвэрлэх цех, лаборатор байгуулна.	19,42	3

Direct driver: Barriers limit success of regeneration and reforestation	Шууд бус хүчин зүйл: Үр дүнгүй ойжуулалт, хангалтгүй байгалын сэргэн ургалт		
Underlying driver: Tree planting and nursery techniques	Шууд бус хүчин зүйл: Ойжуулалтын техник, тоног төхөөрөмж		
Introduce techniques of containerized seedling production system in local tree nurseries.	Далд үндэсний систэмтэй тарьц ургуулах технологийг МҮГ-т нэвтрүүлнэ.	19,40	3
Results-based system that incentivises maintenance after planting.	Ойжуулалтын ажилд үр дүнд суурилсан урамшуулалын тогтолцоо бүрдүүлнэ	20,92	1
Training of forest (PFE/ FUG) staff.	Нөхөрлөл, ААН-ийн ажилчдыг сургана.	19,52	2
Underlying driver: Materials of unknown genetic origin	Шууд бус хүчин зүйл: Үрийн гарал үүсэл тодорхойгүй, чанар муу		
Effective implementation of new seed law to ensure only good seed quality adapted to the area of planting. This can be through a combination of training, incentives and control measures.	Ойн үрийн хуулийг баталж, сургалт, хяналт, урамшууллын замаар тухайн бүс нутагт зохицсон сайн чанарын үрээр ойжуулалт хийдэг тогтолцоог бүрдүүлнэ. .	19,98	1
Apply climate adaptive system of tree seedling production.	Уур амьсгалын өөрчлөлтөд дасан зохицсон тарьц суулгаж бойжуулна	19,97	2
Expand tree seed orchards and permanent forest plots for qualified seed harvesting.	Ойн чанар сайтай үрийн байнгын хэсэг, сонгомол үрийн плантацын талбайг нэмэгдүүлнэ.	19,20	4
Create tree seed bank and high quality seed storage in order to secure continuous supply of tree seeds for seedling production and operate integrated lab of seed and soil analysis.	Ойн үрийн сан, сайн чанарын үрийн нөөц бүрдүүлж, тарьц суулгац ургуулах, үрийн болон хөрсний чанарт шинжилгээ хийж хяналт тавина.	18,94	5
Develop policy for enhancing status of forest and tree seed controls; certification and establishing tree seed banks.	Мод үржүүлгийн газарт тариалах үрийг тухайн бүс нутгийн ойгоос бэлтгүүлж, үрийн гарал үүсэл, удамшлын чанарт нарийн хяналт тогтоох	19,61	3
Create importing ban for seedling and saplings from abroad	Тарьц, суулгацын импортыг хориглох	17,83	6
Underlying driver: Site preparation compromised by inadequate or out-dated equipment.	Шууд бус хүчин зүйл: Ойжуулалтын тоног төхөөрөмж хуучирсан, хөрс бэлтгэх хангалтгүй		
Purchase new equipment.	Шинэ тоног төхөөрөмжөөр хангах	19,08	2
Develop and update techniques of forest natural regeneration improvement for progressive forest rehabilitation.	Байгалийн сэргэн ургалтыг дэмжих ажлын арга, технологийг сайжруулж, ойн нөхөн сэргээлтийг шинэ шатанд гаргана.	20,44	1
Underlying driver: Grazing in plantations and natural regeneration	Шууд бус хүчин зүйл: Ойжуулсан болон байгалийн сэргэн ургасан модыг мал идэх		

Agreements with herders for management of grazing and plantations.	Ойжуулсан болон сэргэн ургасан талбайг хамгаалах чиглэлээр малчидтай зөвшилцөл хийх.	20,08	3
Fencing of areas with risk of grazing.	Мал орох эрсдэлтэй газруудыг хашиж хамгаалах.	18,86	4
Results-based system that incentivises maintenance after planting.	Ойжуулсан талбайн арчилгаанд урамшуулал олгох	20,59	2
Optimum site selection and design for reforestation policy	Ойжуулах талбайг зөв сонгож, зураг төслийн дагуу гүйцэтгэх	20,70	1
Direct driver: Mining in forest areas	Шууд хүчин зүйл: Ойд ашигт малтмалын олборлолт явуулах		
Underlying driver: Illegal mining in forest areas mostly related to opportunism and less to poverty (only a problem in a limited area).	Шууд бус хүчин зүйл: Хууль бус алт олборлогчид (Зарим нэг аймаг сумдад)		
Improve incentives for local level patrolling in aimags with minerals of high value (gold).	Хууль бусаар ашигт малтмал олборлогчдод тавих эргүүл хяналтыг сайжруулах, урамшуулах (алт)	19,11	1
Improve law enforcement targeted areas with higher risk of illegal mining.	Хууль бус алт олборлогчдод хүлээлгэх хуулийн харицлагыг чангатгах	18,51	2

Annex 7. Result of the feasibility evaluation for initial PAM's each underlining driver

PAMs/ БоАХ		Practical feasibility Практикт			Financial feasibility Санхүүгийн			Political feasibility Улс төрийн		
		low	Medium	High	low	Medium	High	low	Medium	High
Underlying driver: Rural unemployment and poverty – illegal sourcing of wood Шууд бус хүчин зүйл: Ядуурал/ажилгүйдэл-хууль бус мод бэлтгэл										
Rejuvenate older stands to improve forest vitality (shelter wood thinning). This both as a mean to increase forest income, create jobs, rejuvenate stands and promote climate change adaptation.	Нас гүйцсэн, хөгширсөн ойд тохируулах огтлолтыг хийнэ. Энэ нь ойгоос олох орлого, ажлын байрыг нэмэгдүүлэх бөгөөд залуу моддын өсөлтийг сайжруулна.	3	6	13		17	7	4	13	6
Re-establish old forest roads and construct new forest roads in collaboration with concession holders as a mean to facilitate increased thinning and rejuvenation of stands.	Хуучин ойн замуудыг сэргээх болон шинээр ойн зам барьж ойн аж ахуйн үйл ажиллагааг эрчимжүүлэх.	5	11	6	13	11	1	8	9	6
Create new job places in the field of forest salvaging and sanitation cuttings and wood extraction work by supporting through low interest rate loan system for small and medium sized forest entities and forest user groups.	Ойн цэвэрлэгээний ажлын хүрээнд үйлдвэрлэл, үйлчилгээ эрхлэх иргэд, ойн мэргэжлийн байгууллага, нөхөрлөлүүд, жижиг аж ахуйн нэгжийг хөнгөлөлттэй зээл, зээлийн хүүгийн хөнгөлөлтөөр дэмжин орон нутагт ажлын байр бий болгоно..	4	8	12	8	14	3	5	10	9
Provide government support for establishing entities, incubator centers and small and medium-sized enterprises with advanced technologies that develop, introduce and transfer advanced techniques for afforestation,	Эрдэм шинжилгээний байгууллага, их, дээд сургуулийн дэргэд ойжуулалт, нөхөн сэргээлт, ой хамгаалал, мод ашиглах, боловсруулах үйлдвэрлэлийн дэвшилтэт технологи болвсруулах,	3	9	12	5	14	3	4	10	8

PAMs/ БоАХ		Practical feasibility Практикт			Financial feasibility Санхүүгийн			Political feasibility Улс төрийн		
restoration, forest conservation and timber use alongside research organizations, universities and higher education institutes.	нэвтэрүүлэх, дамжуулах нэгж, инкубаторийн төв, өндөр технологийн жижиг, дунд үйлдвэр байгуулахыг төрөөс дэмжих									
Promote local enterprises to add value to forest products and create jobs by processing of non-timber forest products: medicinal plants; nuts and berries, mushrooms basing their sustaining resources.	Ойн дагалт баялгийн ашиглан нэмүү өртөг шингэсэн бүтээгдэхүүн үйлдвэрлэж, ажлын байр нэмэгдүүлэхийг дэмжих		6	15	1	11	9	2	9	10
Review policy and develop guidelines for improved forest law enforcement.	Ойн талаар баримтлах бодлого, эрх зүйн шинэчлэлт хийх	2	7	12	2	7	10	2	5	13
Underlying driver: Ineffective licensing/ low incentives for FUGS & PFES.										
Шууд бус хүчин зүйл: Ойн санг гэрээгээр эзэмшигчидийн эрх, урамшуулал хангалттай бус										
Assess performance-based activities of forest concession entities and FUGs and deliver future guidance for their forest activities.	Ойн санг эзэмшигчдийн үйл ажиллагаанд үнэлэлт өгч, цаашид хэрэгжүүлэх үйл ажиллагааны зөвлөмж гаргана		5	16	2	7	12	2	10	9
Train and allow FUG to do pre-commercial thinning.	Нөхөрлөлүүдийг арчилгааны огтлолт хийх чадвар, эрхтэй болгох.	2	6	13	3	11	7	6	7	8
Create economic incentives for forest protection for FUG and establish new system for distribution and re-distribution of forest resource use fees for forest protection and management	Ойн нөхөрлөлүүдийн эдийн засгийн урамшууллын тогтолцоо, байгалийн нөөц ашигласны төлбөрийн хуваарилалт, дахин хуваарилалтын систем бий болгох	2	13	6	5	13	3	5	9	7
Underlying driver: Poor institutional capacity.										
Хүчин зүйл: Салбарын байгууллагын чадавхи, тогтолцоо сул										
Promote staffing at all level of forest institutions.	Бүх шатанд ойн мэргэжлийн ажилчдын орон тоог нэмэгдүүлэх	3	10	10	6	12	3	6	8	8

PAMs/ БоАХ		Practical feasibility Практикт			Financial feasibility Санхүүгийн			Political feasibility Улс төрийн		
Create new jobs in forest sanitation cuttings through low interest rate loan system for SMEs and FUGs.	Ойн цэвэрлэгээний ажлын хүрээнд үйлдвэрлэл, үйлчилгээ эрхлэх иргэд, ойн мэргэжлийн байгууллага, нөхөрлөлүүд, жижиг аж ахуйн нэгжийг хөнгөлөлт тэй зээл, зээлийн хүүгийн хөнгөлөлтөөр дэмжин орон нутагт ажлын байр бий болгоно.	5	11	9	8	13	5	6	11	9
Underlying driver: Low cutting volumes incentivizing illegal logging. Хүчин зүйл: Бэлтгэх модны дээд хязгаар хэт бага байгаа нь хууль бус мод бэлтгэлийг нэмэгдүүлж байна										
Create new jobs in forest sanitation cuttings through low interest rate loan system for SMEs and FUGs.	Ойн цэвэрлэгээний ажлын хүрээнд үйлдвэрлэл, үйлчилгээ эрхлэх иргэд, ойн мэргэжлийн байгууллага, нөхөрлөлүүд, жижиг аж ахуйн нэгжийг хөнгөлөлт тэй зээл, зээлийн хүүгийн хөнгөлөлтөөр дэмжин орон нутагт ажлын байр бий болгоно.	3	6	10	6	9	3	4	6	10
Review policy and develop guidelines for improved forest law enforcement.	Ойн талаар баримтлах бодлого, эрх зүйн шинэчлэлт хийх	3	8	13	7	7	10	2	5	16
Create new job places in the field of forest salvaging and sanitation cuttings and wood extraction work by supporting through low interest rate loan system for small and medium sized forest entities and forest user groups.	Ойн цэвэрлэгээний ажлын хүрээнд үйлдвэрлэл, үйлчилгээ эрхлэх иргэд, ойн мэргэжлийн байгууллага, нөхөрлөлүүд, жижиг аж ахуйн нэгжийг хөнгөлөлт тэй зээл, зээлийн хүүгийн хөнгөлөлтөөр дэмжин орон нутагт ажлын байр бий болгоно.	3	9	9	8	10	4	3	8	11
Underlying driver: Insufficient funding for sustainable forest management. Хүчин зүйл: Хангалтгүй санхүүжилт, Төсвөөс хараат байдал										

PAMs/ БоАХ		Practical feasibility Практикт		Financial feasibility Санхүүгийн			Political feasibility Улс төрийн			
Implement sustainable ecotourism spilt with communities and private sector in buffer zones of key forest areas.	Тогтвортой эко аялал жуулчлалыг Ой бүхий газар нутгуудад хувийн хэвшил, нутгийн иргэдийн оролцоотойгоор хөгжүүлнэ	4	4	15	7	10	6	5	8	10
Long term and timely harvest allocations for PFEs.	Ойн санг эзэмшигч аж ахуйн нэгжид ОМТ-ний дагуу урт хугацаанд тогтвортой үйл ажиллагаа явуулах, хөрөнгө оруулалт татах боломжийг бий болгох	2	6	15	6	9	8	6	11	6
Promote green economy through taxation policy and ecosystem services fee.	Ногоон эдийн засгийн дэмжсэн татварын бодлого, эрх зүйн орчныг бий болгоно.	3	11	9	5	12	6	4	11	8
Promote local enterprises to add value to forest products and create jobs by processing of non-timber forest products: medicinal plants; nuts and berries, mushrooms basing their sustaining resources	Ойн хөрс, ус болон биологийн олон янз байдлыг хамгаалах зэрэг экологийн ач холбогдлыг үнэлсэн экосистемийн үйлчилгээний төлбөрийг бий болгон мөрдөх	2	14	7	6	9	8	5	12	7
Create vertical forest institutional structure in local level	Анхан болон дунд шатны Ойн байгууллагыг босоо бүтцэд оруулах		4	16	3	8	8	3	6	11
Extend work area and responsibility of current inter Soum Forest units to Forestry such a self financing forest silvicultural activity and non timber product processing	Одоогийн ойн ангийг Ойн АА болгон өөрчлөх, өөрөө өөрийгөө санхүүжүүлэх, үйлдвэрлэл явуулах боломжтой болгох		7	13	6	8	5	5	5	9
Underlying driver: Poor awareness and experience in use of forest resources Хүчин зүйл: Ойн нөөцийг иж бүрэн ашиглах туршлага, мэдлэг сул										
Train and allow FUG to do pre-commercial thinning.	Нөхөрлөлүүдийг арчилгааны огтлолт хийх чадвар, эрхтэй болгох.	5	5	12	6	4	12	7	6	10
Promote staffing in forest management and practices in all level of forest institutions.	Бүх шатанд ойн мэргэжлийн ажилчдын орон тоог нэмэгдүүлэх	4	8	11	8	12	3	5	8	10
Improve public education.	Олон нийтийн мэдлэгийг дээшлүүлэх		6	17	2	13	8	1	11	12

PAMs/ БоАХ		Practical feasibility Практикт		Financial feasibility Санхүүгийн			Political feasibility Улс төрийн			
Underlying driver: Perception of forests as a public good of low value. Хүчин зүйл: Perception of forests as a public good of low value										
Establish a system that promotes green economy.	Ногоон эдийн засгийг дэмжсэн тогтолцоог бүрдүүлэх	3	10	10	7	11	4	1	7	13
Establish and enforce payments for ecosystem services.	Экосистемийн үйлчилгээний төлбөрийг бий болгон мөрдөх	2	11	10	6	11	7	4	9	11
Expanding/strengthening the protected areas system.	УТХГН-ын сүлжээг өргөтгөх/бэхжүүлэх	2	11	10	7	11	5	2	7	13
Implement law on Payment of Natural Resources Use	БОНБАТ тухай хуулийг хэрэгжүүлэх	2	3	15	5	4	11	5	4	12
Increase inter-ministerial cooperation	Яамд хоорондын хамтын ажиллагаа, ажлын уялдааг сайжруулах		4	16	2	6	10	3	1	15
Underlying driver: Barriers for business development for Private Forests Enterprises. Хүчин зүйл: Ойн салбарын аж ахуйн нэгжүүдийн хөрөнгө оруулалт, бизнесийн хязгаарлагдмал нөхцөл										
Provide long term and timely harvest allocations for forest companies to improve their ability to plan and make investments.	Ойн санг эзэмшигч аж ахуйн нэгжид ОМТ-ний дагуу урт хугацаанд тогтвортой үйл ажиллагаа явуулах, хөрөнгө оруулалт татах боломжийг бий болгох..	3	8	12	6	9	7	4	4	8
Re-establish old forest roads and construct new forest roads in collaboration with concession holders as a mean to facilitate increased thinning and rejuvenation of stands	Хуучин ойн замуудыг сэргээх болон шинээр ойн зам барьж ойн аж ахуйн үйл ажиллагааг эрчимжүүлэх.	4	13	6	15	6	1	7	10	6
Create new job places in the field of forest salvaging and sanitation cuttings and wood extraction work by supporting through low interest rate loan system for small and medium sized forest entities and forest user groups.	Ойн цэвэрлэгээний ажлын хүрээнд үйлдвэрлэл, үйлчилгээ эрхлэх иргэд, ойн мэргэжлийн байгууллага, нөхөрлөлүүд, жижиг аж ахуйн нэгжийг хөнгөлөлттэй зээл, зээлийн хүүгийн хөнгөлөлтөөр дэмжин орон нутагт ажлын байр бий болгоно	1	12	10	9	12	1	5	10	8

PAMs/ БоАХ		Practical feasibility Практикт		Financial feasibility Санхүүгийн			Political feasibility Улс төрийн			
Forest professional NGO should be in charge of issuing forest professional certificates for companies	Ойн мэргэжлийн байгууллагын эрх олгох асуудлыг Мэргэжлийн төрийн бус байгууллагаар гүйцэтгүүлэх	6	14	3	7	10	7	5	8	
Allocate harvest permission for a ten year period in accordance with 10 years forest management plan	ОМТ-г 10 жилээр баталдаг болох	3	17		7	11	1	7	12	
Underlying driver: Weak law enforcement. Хүчин зүйл: Хуулийн хэрэгжилт сул										
Review policy and develop guidelines for improved forests law enforcement.	Ойн талаар баримтлах бодлого, эрх зүйн шинэчлэлт хийх	7	15	3	7	11		10	12	
Increase inter-ministerial cooperation	Яамд хоорондын хамтын ажиллагаа, ажлын уялдааг сайжруулах	4	16	2	6	10	3	1	15	
Direct driver: Forest fire Шууд хүчин зүйл: Ойн түймэр										
Underlying driver: Fire not viewed as an issue. Шууд бус хүчин зүйлүүд: Ойн түймэрт хайхрамжгүй ханддаг										
Launch awareness campaign on the risk of forest fire and the consequences.	Түймрийн эрсдэл, хор хөнөөлийн талаар сургалт, сурталчилгаа явуулах.	1	3	16	5	5	10	2	3	15
Increase awareness by including forest, environment and climate change in school curriculum.	Байгаль орчин, түймэр, уур амьсгалын өөрчлөлтийн талаар дунд сургуулийн сургалтын хөтөлбөрт оруулах.	3	19	4	4	14	3	4	15	
Underlying driver: Failure to prevent forest fire Шууд бус хүчин зүйлүүд: Ойн түмрээс урьдчилан сэргийлэх ажил хангалтгүй										
Train local community in efforts to reduce forest fire, use local community champions to train other communities.	Нутгийн иргэдийн түймэртэй тэмцэх чадавхийг нэмэгдүүлэх, сургалтад хамруулах	5	19	7	9	7	3	5	16	
Take prevention actions against forest fires by creating fire break strips in forest-steppe boundary in high risk areas.	Улсын хилийн бүс, шаардлагатай газруудад түймрийн эсрэг шороон зурвас татах, зам, ойн зааг гаргах ажлыг зохион байгуулах зэргээр түймрийн тархалтаас сэргийлэх арга хэмжээг авах	5	6	12	1 2	8	2	2	8	13

PAMs/ БоАХ		Practical feasibility Практикт			Financial feasibility Санхүүгийн			Political feasibility Улс төрийн		
Promote networking in trans-boundary fire information exchanges among neighbours and create agreements on forest fire prevention and extinguishment at the level of Governments of neighbouring countries.	Хил дамжсан түймрээс сэргийлэх, түүнтэй тэмцэх талаар хөрш орнуудтай Засгийн газар хооронд гэрээ байгуулах, байгуулсан гэрээг хэрэгжүүлэх, хил дамнан гарч байгаа түймрийн мэдээллийн сүлжээг сайжруулах.	5	4	13	6	8	7	1	7	14
Penalties for causing forest fire	Түймэр алдсаны хариуцлага тооцох арга хэмжээг чангатгах	8	3	12	7	7	8	3	8	12
Install lightning prevention system in key forest area	Аянга зайлуулагч тавих	2	4	12	6	10		8	2	8
Underlying driver: Failure to control forest fire										
Шууд бус хүчин зүйл: Түймэрт тавих хяналт сул										
Create forest fire fighting units/stations in Department of Emergency at aimag and soum level; and provide support from the state in supplying necessary equipment for combating forest fires with promotion of capacity of forest fire fighting and preventing activities.	Ойн түймрээс сэргийлэх, түймэртэй тэмцэх ажлын материаллаг баазыг бэхжүүлж, аймгийн онцгой байдлын газар, сумын ойн асуудал хариуцсан нэгжийн дэргэд ой, хээрийн түймэр унтраах хэсэг (станц) байгуулж гал унтраах машин, тоног төхөөрөмж хэрэгсэл, бодисоор хангаж төсвөөс санхүүжүүлэх.	9	6	8	1 6	6		4	10	9
Monitor implementation of planned activities for forest fire prevention and extinguishing at aimag, cities and soums and promote legal and financing incentives for forest fire management.	Ойн түймрээс сэргийлэх, түймэртэй тэмцэх талаар аймаг, нийслэл, сумын төлөвлөгөөнд тусгагдсан ажлын биелэлтийг жил бүр дүгнэж, түймрийн менежментэд эрх зүйн болон санхүүгийн урамшуулал үзүүлэх	2	14	7	8	13	2	1	14	9
Promote networking in trans-boundary fire information exchanges among neighbours and create agreements on forest fire	Хил дамжсан түймрээс сэргийлэх, түүнтэй тэмцэх талаар хөрш орнуудтай Засгийн газар хооронд гэрээ байгуулах,	4	5	11	4	10	6	1	6	13

PAMs/ БоАХ		Practical feasibility Практикт		Financial feasibility Санхүүгийн		Political feasibility Улс төрийн				
prevention and extinguishment at the level of Governments of neighbouring countries.	байгуулсан гэрээг хэрэгжүүлэх, хил дамнан гарч байгаа түймрийн мэдээллийн сүлжээг сайжруулах.									
Re-establish old forest roads or establish new forest roads with a view to improve access to forest areas.	Хуучин ойн замуудыг сэргээх болон шинээр ойн зам барьж ойн гүнд нэвтрэх боломжийг сайжруулах	5	8	8	1 2	8	1	5	9	7
Invest in forest fire equipment.	Түймэртэй тэмцэх тоног төхөөрөмжөөр хангах	2	11	9	1 3	8	1	3	9	7
Take actions for rapid detection and extinguish of fires through remote sensing monitoring and improve information dissemination.	Зайнаас тандан судлах, агаарын болон газрын эргүүл гаргах замаар ойн түймрийг шуурхай илрүүлж, тэмцэх, арга хэмжээ авах	2	8	12	1 0	8	4	1	10	12
Establish new financial incentives for operational detection and extinguish activities of forest fire prevention by organizing forest fire extinguishing voluntary groups and mobilizing seasonally operating patrols at aimags and soums of forest areas.	Ой бүхий аймаг, сумдад улирлын урамшуулалттай түймрийн эргүүл гаргах, түймэр унтраах сайн дурын бүлэг зохион байгуулах замаар түймрийг шуурхай илрүүлэх, тэнд ажилласан хүмүүст санхүүгийн урамшуулал үзүүлэх механизм бүрдүүлэх	3	10	9	1 3	7	2	2	8	12
Underlying driver: High fuel load in forests Шууд бус хүчин зүйл: Ойд шатах материалын нөөц хэт их										
Re-establish old forest roads or establish new forest roads with a view to improve access to forest areas and reduce fuel load.	Хуучин ойн замуудыг сэргээх болон шинээр ойн зам барьж ойн гүнд нэвтрэх боломжийг сайжруулах.	3	8	11	1 5	6	1	6	9	7
Implement forest cleaning to reduce fuel loads.	Ойн цэвэрлэгээ хийж шатах нөөцийг бууруулах	2	11	11	1 1	9	4	2	9	13
Direct driver: Forest pest outbreak Шууд хүчин зүйл: Ойн хөнөөлт шавьж, өвчин										
Underlying driver: Forest health weakened due to dense stands and fire Шууд бус хүчин зүйл: Түймэр болон хөгшрөлтөөс ойн эрүүл байдал доройтсон										

PAMs/ БоАХ		Practical feasibility Практикт		Financial feasibility Санхүүгийн			Political feasibility Улс төрийн			
Apply new techniques of forest tending and salvaging/sanitation cuttings through investment opportunities and investment loan and other different financial sources.	Хөрөнгө оруулалт, хөрөнгийн зээл болон бусад эх үүсвэрээс хөнгөлттэй нөхцөлтэйгөөр ойн арчилгаа, цэвэрлэгээний ажилд орчин үеийн техник, технологийг нэвтрүүлнэ.	5	9	10	15	7	1	3	10	11
Promote resilience in production forests by rejuvenating over-aged forests.	Нас гүйцсэн, хөгшин модыг ашиглаж ойн бүтээмжийг нэмэгдүүлэх	1	7	16	5	11	7	5	7	12
Underlying driver: Abundance of dead wood – habitat for pest and diseases Шууд бус хүчин зүйл: Унанги хатсан модны хэмжээ нэмэгдсэнээс хөнөөлт шавж, өвчин нэмэгдэх нөхцлийг бүрдүүлж байна										
Create incentives for FUG for forest protection	Ойг цэвэрлэгээний ажил гүйцэтгэсэн нөхөрлөлүүдийг урамшуулах	1	6	16	8	9	5	4	3	16
Promote resilience in production forests by rejuvenating over-aged forests.	Нас гүйцсэн, хөгшин модыг ашиглаж ойн бүтээмжийг нэмэгдүүлэх	2	7	14	5	12	4	5	8	9
Underlying driver: Poor awareness and experience in use of forest resources and sustainable forest management а) Шууд бус хүчин зүйл: Ойн нөөцийг иж бүрэн ашиглах туршлага, мэдлэг сул										
Develop and implement national programs for capacity building.	Мэдлэг, чадавхийг дээшлүүлэх үндэсний хөтөлбөр боловсруулж хэрэгжүүлэх.	1	6	16	6	8	8	3	8	11
Share experiences in insect population control and tree diseases with other countries with boreal forests	Хөнөөлт шавж, өвчинтэй тэмцэх арга зүйн талаар бусад орны туршлагыг судлах, хэрэгжүүлэх арга хэмжээ авч эхлэх	3	5	15	10	7	5	5	6	12
Increase collaboration between government, private sector and research institutes on forest pest management.	Төр, хувийн хэвшил, судалгааны байгууллага хоорондын ажлын уялдаа холбоог сайжруулах	2	6	15	6	7	10	6	7	10
Introduce National forest certification system comply with International Certification system	Үндэсний Ойн магадлан итгэмжлэлийг нэвтрүүлэх, улмаар олон улсын магадлан итгэмжлэлд нэгдэх	1	3	17	3	7	11	2	7	12
Attracy qualified staff by making it	Ойн мэргэжлийн ажилчдын цалин хангамжийг	4	5	11	8	7	4	5	6	9

PAMs/ БоАХ		Practical feasibility Практикт		Financial feasibility Санхүүгийн			Political feasibility Улс төрийн			
more attractive to be forest professional	нэмэгдүүлэх, нийгмийн арга хэмжээ авах									
Underlying driver: Poor capacity for pest control Шууд бус хүчин зүйл: Хөнөөлт шавжинд тавих хяналт, чадавхи сул										
Develop strategic guidelines and standard operating procedures for insect control.	Хөнөөлт шавж, өвчнийг хянах стратеги, заавар боловсруулах.	2	4	17	6	7	10	4	7	12
Increase collaboration between government, private sector and research institutes on forest pest management.	Төр, хувийн хэвшил, судалгааны байгууллага хоорондын ажлын уялдаа холбоог сайжруулах	4	3	15	6	7	9	6	7	9
Improve rapid transfer of financial resources on timely basis to deal with pest outbreak.	Хөнөөлт шавжийн хэт олшролын үед шуурхай зарцуулах сан бий болгох	4	5	10	10	4	5	7	3	9
Training and education of experts on forests pests.	Ойн хөнөөлт шавж, өвчний чиглэлээр мэргэшсэн мэргэжилтэн бэлтгэнэ	1	7	12	9	3	8	8	5	7
Underlying driver: Information on pest and diseases affecting forests Шууд бус хүчин зүйл: хөнөөлт шавж, өвчинд нэрвэгдсэн ойн судалгаа, мэдээлэл										
Establish permanent monitoring plots on forest insect outbreaks and insect population dynamics based in forest vegetation zones.	Ойн хөнөөлт шавжийн хэт олшролын хөдлөл зүйд ажиглалт судалгаа явуулах суурин цэгүүдийг бүс нутгийн ойн хэв шинж тус бүрд байгуулах	2	9	12	11	9	3	4	12	7
Research on insect biology and tree diseases affecting forests and establish thresholds for active intervention.	Тэмцлийн ажил гүйцэтгэх шаардлага, босго шалгуурыг оновчтой тогтоох арга зүйг боловсруулах		7	15	6	8	8	2	9	11
Underlying driver: Out-dated equipment for pest control	Шууд бус хүчин зүйл: Хөнөөлт шавжтай тэмцэх багаж тоног төхөөрөмж хуучирсан									
Invest in equipment to carry out pest control measures.	Хөнөөлт шавжтай тэмцэх багаж тоног төхөөрөмжөөр хангах	2	6	14	9	9	4	4	10	8
Investigate the feasibility for domestic production of biological	Цэмцлийн ажилд дотоодын био бэлдмэлийг ашиглах.	4	3	14	9	5	7	4	5	12

PAMs/ БоАХ		Practical feasibility Практикт			Financial feasibility Санхүүгийн			Political feasibility Улс төрийн		
substance to control pest outbreaks.										
Establish production lab-station for biological substances for the fighting ageing's forest insect.	Хөнөөлт шавьжтай тэмцэх биобэлдмэл үйлдвэрлэх цех, лаборатор байгуулна.	4	14	7	10	2	5	6	9	
Direct driver: Barriers limit success of regeneration and reforestation Шууд бус хүчин зүйл: Үр дүнгүй ойжуулалт, хангалтгүй байгалын сэргэн ургалт										
Underlying driver: Tree planting and nursery techniques Шууд бус хүчин зүйл: Ойжуулалтын техник, тоног төхөөрөмж										
Introduce techniques of containerized seedling production system in local tree nurseries.	Далд үндэсний систэмтэй тарьц ургуулах технологийг МҮГ-т нэвтрүүлнэ.	3	3	16	11	6	5	6	5	11
Results-based system that incentivises maintenance after planting.	Ойжуулалтын ажилд үр дүнд суурилсан урамшуулалын тогтолцоо бүрдүүлнэ	2	7	13	9	9	4	5	6	10
Training of forest (PFE/ FUG) staff.	Нөхөрлөл, ААН-ийн ажилчдыг сургана.	1	6	14	8	6	7	4	7	10
Underlying driver: Materials of unknown genetic origin Шууд бус хүчин зүйл: Үрийн гарал үүсэл тодорхойгүй, чанар муу										
Effective implementation of new seed law to ensure only good seed quality adapted to the area of planting. This can be through a combination of training, incentives and control measures.	Ойн үрийн хуулийг баталж, сургалт, хяналт, урамшууллын замаар тухайн бүс нутагт зохицсон сайн чанарын үрээр ойжуулалт хийдэг тогтолцоог бүрдүүлнэ. .	1	7	15	7	8	8	3	7	13
Apply climate adaptive system of tree seedling production.	Уур амьсгалын өөрчлөлтөд дасан зохицсон тарьц суулгаж бойжуулна	1	9	12	4	12	6	4	9	9
Expand tree seed orchards and permanent forest plots for qualified seed harvesting.	Ойн чанар сайтай үрийн байнгын хэсэг, сонгомол үрийн плантацын талбайг нэмэгдүүлнэ.		12	9	7	10	4	1	14	8
Create tree seed bank and high quality seed storage in order to secure continuous supply of tree seeds for seedling production and operate	Ойн үрийн сан, сайн чанарын үрийн нөөц бүрдүүлж, тарьц суулгац ургуулах, үрийн болон хөрсний чанарт шинжилгээ	1	11	13	10	10	5	4	7	14

PAMs/ БоАХ		Practical feasibility Практикт			Financial feasibility Санхүүгийн			Political feasibility Улс төрийн		
integrated lab of seed and soil analysis.	хийж хяналт тавина.									
Develop policy for enhancing status of forest and tree seed controls; certification and establishing tree seed banks.	Мод үржүүлгийн газарт тариалах үрийг тухайн бүс нутгийн ойгоос бэлтгүүлж, үрийн гарал үүсэл, удамшлын чанарт нарийн хяналт тогтоох		8	15	6	9	8	3	8	12
Create importing ban for seedling and saplings from abroad	Тарьц, суулгацын импортыг хориглох	1	3	16	1	3	16	5	3	12
Underlying driver: Site preparation compromised by inadequate or out-dated equipment. Шууд бус хүчин зүйл: Ойжуулалтын тоног төхөөрөмж хуучирсан, хөрс бэлтгэх хангалтгүй										
Purchase new equipment.	Шинэ тоног төхөөрөмжөөр хангах	2	11	10	1 4	6	3	6	5	12
Develop and update techniques of forest natural regeneration improvement for progressive forest rehabilitation.	Байгалийн сэргэн ургалтыг дэмжих ажлын арга, технологийг сайжруулж, ойн нөхөн сэргээлтийг шинэ шатанд гаргана.	1	7	14	8	10	4	4	6	13
Underlying driver: Grazing in plantations and natural regeneration Шууд бус хүчин зүйл: Ойжуулсан болон байгалийн сэргэн ургасан модыг мал идэх										
Agreements with herders for management of grazing and plantations.	Ойжуулсан болон сэргэн ургасан талбайг хамгаалах чиглэлээр малчидтай зөвшилцөл хийх.	3	8	12	9	4	10	7	5	11
Fencing of areas with risk of grazing.	Мал орох эрсдэлтэй газруудыг хашиж хамгаалах.	7	9	7	1 5	6	2	8	5	10
Results-based system that incentivises maintenance after planting.	Ойжуулсан талбайн арчилгаанд урамшуулал олгох	3	8	12	8	13	2	6	5	12
Optimum site selection and design for reforestation policy	Ойжуулах талбайг зөв сонгож, зураг төслийн дагуу гүйцэтгэх		3	16	3	8	8		10	9
Direct driver: Mining in forest areas Шууд хүчин зүйл: Ойд ашигт малтмалын олборлолт явуулах										
Underlying driver: Illegal mining in forest areas mostly related to opportunism and less to poverty (only a problem in a limited area). Шууд бус хүчин зүйл: Хууль бус алт олборлогчид (Зарим нэг аймаг сумдад)										

PAMs/ БоАХ		Practical feasibility Практикт			Financial feasibility Санхүүгийн		Political feasibility Улс төрийн			
Improve incentives for local level patrolling in aimags with minerals of high value (gold).	Хууль бусаар ашигт малтмал олборлогчдод тавих эргүүл хяналтыг сайжруулах, урамшуулах (алт)	4	11	8	1 1	10	2	7	8	9
Improve law enforcement targeted areas with higher risk of illegal mining.	Хууль бус алт олборлогчдод хүлээлгэх хуулийн харицлагыг чангатгах	6	10	7	1 0	8	5	4	9	9



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Address: Government Building II, United Nations Street 5/2,

Chingeltei District, Ulaanbaatar 15160, Mongolia

Tel: +976-7711-7750

Email: info@unredd.mn

Web site: www.reddplus.mn