



Completion Report

Project Number: 50012-001
Technical Assistance Number: 9233
June 2020

Mongolia: Conservation of Forest Genetic Resources

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TECHNICAL ASSISTANCE COMPLETION REPORT

TA Number, Country, and Name: TA 9233-MON: Conservation of Forest Genetic Resources		Amount Approved: \$500,000.00	
		Revised Amount: Not applicable	
Executing Agency: Ministry of Environment and Tourism	Source of Funding: Japan Fund for Poverty Reduction	Amount Undisbursed: \$78,138.77	Amount Used: \$421,861.23
TA Approval Date: 18 November 2016	TA Signing Date: 23 February 2017	TA Completion Date	
		Original Date: 30 November 2018	Latest Revised Date: Not applicable
TA Type: Capacity development TA		Financial Closing Date: 17 December 2018	Number of Extensions: None

Description

The technical assistance (TA) aimed to support the government in implementing its forest laws and policies, particularly the implementation of the Law on Forest,^a as well as the State Policy on Forest.^b Increasing the forest cover to preserve the natural landscape and biodiversity in a sustainable way was a key objective of the State Policy on Forest. The Law on Forest stipulates to use only forest genetic resources (FGR) from officially approved sources in appropriate forest seed zones for artificial regeneration. This requires developing legal frameworks for access to and certification of FGRs. The TA supported the government in developing FGR-related decrees and building capacity in FGR management.

Mongolia has a unique natural landscape and biodiversity with valuable FGRs, which are the heritable materials maintained within and among tree species that are of economic, environmental, scientific, or societal value. They are crucial to the adaptation and protection of Mongolia's ecosystems, landscapes, and production systems, yet are subject to increasing pressures and unsustainable use. Climate change and other anthropogenic factors are decreasing forest cover. Climate models indicate that temperatures will continue to rise, and more than 80% of the country's territory is defined as highly vulnerable to climate extremes.^c Climate-related disasters with high social and economic costs, including droughts, severe storms, and flash floods, have doubled in frequency since 1997. In forest ecosystems, the main climate change impact is decreasing forest cover due to expansion of steppe and desert.

A lack of FGR conservation strategies, especially a forest seed selection and conservation strategy, has resulted in FGR degradation in Mongolia. National and subnational strategies are critical missing pieces for Mongolia's conservation of FGRs and their sustainable use. Strategies for the development of a forest seed conservation business plan is needed to support the conservation of key FGRs and their evolutionary abilities for the future. Defining and implementing conservation strategies provided a good justification for coordinating, collaborating, and making cost-effective investments in conserving forest seeds. The TA developed national and subnational strategies, policy tools, and standards for the conservation of forest seeds and their sustainable use.

Sustainable forest regeneration depends on the appropriate selection and use of high-quality seeds for different forest vegetation regions. Mongolia can be divided into three forest vegetation regions: Central Asia, mountain range, and South. Since 2012, forest management line agencies (forest units) have established permanent forest seed collection sites with funding support from the government. The purpose of these sites was to prepare high-quality forest seeds for forestation. Due to funding and human resources capacity constraints, the government has not been able to take the required steps for the formulation of a forest seed development business model. The TA identified sustainable forest seed plantations (forest seed stands) to supply high-quality forest seeds for forest regeneration purposes and strengthened forest staff capacity in required forest seed selection techniques.

Increasing the forest-covered area through forest restoration and afforestation requires an increasing quantity and quality of selected FGRs for seedling preparation. Selection and certification of FGRs in registered forest seed stands is an important means in situ conservation and propagation of adapted and resilient forest seeds for forest seedling preparation and plantation.

The lack of trained personnel was a major impediment to developing and implementing FGR strategies and projects. Capacity building is crucial to providing the skills needed to manage FGRs. The projects of two other development partners, the Government of the Czech Republic^d and German development cooperation through *Deutsche Gesellschaft für Internationale Zusammenarbeit*, also contributed to the development of FGRs by providing a related policy and legal-administrative framework.^e The TA was able to build on achievements in this area by implementing complementary activities.

Expected Impact, Outcome, and Outputs

The expected impact of the TA was an increase in the resilience of forest ecosystems to climate change. The expected outcome was the improved management of forest seed stands. The TA assessed and identified forest seed stands in natural forests and developed proposals for necessary government decrees for the establishment of forest seed stands. The TA focused on capacity-building activities with concerned stakeholders on all aspects of forest seed stand management. A key TA performance indicator is the implementation of a national registry on forest seed stands by Ministry of Environment and Tourism (MET). The national registry on forest seed stands defined the required data for seed stands, selection criteria for approval, and process of approval of seed sources.

The expected outputs of the TA were (i) forest seed stands within forest regions of Mongolia identified, (ii) national registry on forest seed stands developed, and (iii) educational and research capacities on FGR established and strengthened.

Implementation Arrangements

The TA management office was established to coordinate with the Asian Development Bank (ADB), provided guidance on the TA implementation issues and ensured intra- and interdepartmental coordination. MET initiated the establishment of an inter-ministerial project steering committee. The TA management office was responsible for the day-to-day operational matters among ADB, the TA consultants, and government agencies.

The TA implementation was supported by national consultants through a consulting firm (60 person-months), an individual international consultant (6 person-months), and an international resource person (10 person-days). The TA consultants were mobilized in April 2017. The inception mission (29–31 May 2017), interim review mission (17–18 April 2018), and final review mission (23–24 October 2018) were participated by the TA consultants, MET, agencies of environment and tourism at *aimag* (province) level, academia, and other bilateral development partners of the forestry sector of Mongolia.

In all TA activities, Japanese visibility was ensured in all printed materials, workshop banners, and communications with the local media. Activities were also coordinated with the Japan International Cooperation Agency (JICA), Japanese nongovernment organizations, private sector, and academic institutions for collaboration opportunities to utilize Japan's human resources, expertise, financial resources, and technologies.

Conduct of Activities

Output 1: Forest seed stands within forest regions of Mongolia identified.

Deliverables completed include (i) assessment report of the established forest seed stands submitted to MET with a total of 26 assessed seed stands assessed and identified new forest seed stands; (ii) seed collection, quality, and yield assessment for Scots pine seed trees and a scientific article published; (iii) a map, with identified forest seed regions presented to the Academic Council of Institute of Geography and Geoecology, Mongolian Academy of Sciences and adopted by the Academic Council Meeting on 26 March 2018; (iv) guidelines to assess forest yields published by MET in October 2018; and (v) technical guidelines on tree seed management used during training sessions and published by MET in October 2018.

Output 2: National registry on forest seed stands developed.

Deliverables completed include (i) proposal for the national registry on forest seed stands submitted to MET; (ii) proposal for national standards for the establishment of tree seed stands submitted to MET and adopted by the Mongolian Agency for Standardization and Metrology; and (iii) proposal for forest seed storage facilities improvement, including capacity building of staff in the established national seed storage facility. Trained staff acquired skills in seed quality selection, registration, and conservation for storage.

Output 3: Educational and research capacities on forest genetic resources established and strengthened.

Deliverables completed include (i) training curricula and materials, which received a satisfactory rating from the National University of Mongolia, the Mongolian University of Life Sciences, and the Institute of Forest Product Research and Training of the Mongolian University of Science and Technology; (ii) five trainings consisting of six modules in all three project *aimags* and with more than 200 participants, including those from vocational schools; (iii) Level 1–2 trainings of trainers in 2017; and (iv) Level 3 trainings for forest user groups and community forest groups, private vulnerable groups, and low-income households in three project *aimags* in 2018.

Technical Assistance Assessment Ratings

Criterion	Assessment	Rating
Relevance	The intended outcome of improvement in management of forest seed stands was fully aligned with country development priorities on increasing the resilience of forest ecosystems to climate change. The TA's results chain was sound, and the design did not have deficiencies. Many seed stands did not exist anymore, and the existing seed	Highly relevant

Criterion	Assessment	Rating
	stands were unsuitable. Suitable seed stands were identified. Forest staff on all administrative levels were aware of the importance of adequate seed stands, and their management was trained for these tasks. The TA was aligned with the Mongolian Law on Forests and the National Policy on Forests. The following government projects or programs benefitted from the TA's outcome: (i) National Programme on "Green Belt", (ii) Mongolia–Korea Joint "Green Belt" Project, and (iii) National Programme on Silviculture and Seed Stand Establishment. The TA demonstrated value for future forest development projects, especially the lending project in ADB's country operations business plan for Mongolia.	
Effectiveness	The TA's outcome and all output targets were met. The outcome is highly effective as the improvement of seed stand registry system, selection of new seed stands, and the trained people are the basis for better forest seed management in the future. This means that there will be a continuous supply with high-quality tree seeds in the future, if MET and its subordinate units implement seed stand management according to the newly developed regulations and guidelines.	Highly effective
Efficiency	The achieved capacity development of forest user groups in three provinces through training of trainers was highly efficient, considering the costs of TA support and the timeliness of the TA implementation and outcome; and considerable savings of the TA fund. Training activities on FGR strengthened management of forest seed stands.	Highly efficient
Overall Assessment	Overall TA project implementation was highly successful due to highly relevant design and outcome which increased the climate resilience of forest ecosystems. The improvement of seed stand registry systems, selection of new seed stands, and the capacity building of forest staff and user groups were achieved in a highly effective and efficient manner.	Highly successful
Sustainability	The TA-supported technical or institutional changes are most likely sustainable. Key achievements are an amendment to the national standard on establishment of permanent seed stand and the formal adoption of national registry system for forest seed stands. The TA has developed national and subnational strategies, policy tools, and standards for the conservation of forest seeds and their sustainable use. MET has fully demonstrated its full ownership of the TA by formally adopting the proposals. Trained forest user groups and community forest groups have income incentives to maintain the forest seed stands.	Most likely sustainable

Lessons Learned and Recommendations

Design and/or planning	The TA project's design was appropriate for achieving the intended outcome. National and international good practices and lessons on forest seed management were shared with relevant authorities.
Implementation and/or delivery	To realize synergies and avoid redundancies, the TA and contracted consulting firm coordinated with ongoing programs by other donors, such as the Food and Agriculture Organization of the United Nations, the Global Environment Facility, the Czech Development Agency, and German development cooperation through the <i>Deutsche Gesellschaft für Internationale Zusammenarbeit</i> . Collaboration with other development partners contributed to the achievement of the TA outcome and outputs. Other partners also contributed to the development of FGR with policy and legal-administrative framework for FGR. MET and the TA consultants had contacted JICA, Japanese nongovernment organizations, private sector, and academic institutions for several times to actively seek for collaboration opportunities to utilize Japan's human resources, expertise, financial resources, and technologies. When trainings were organized, JICA was contacted and invited to send their volunteers to participate in them.
Replication and/or scaling up	The Forest Research and Development Centre of MET would be a suitable entity to deal with assessment, identification and registration of seed stands. MET could scale up with comparable activities to be implemented by the Forest Research and Development Centre in other districts of the forest region and with broad-leaved species.

Follow-up Actions

MET appreciated the achievements of the TA and is interested in a follow-up project. Guided by the outputs of the TA, MET can create an administrative structure to manage forest seeds from <i>aimag</i> to ministry level. A forest sector development programme is included in ADB's country operations business plan for Mongolia, 2020–2021. [†] The
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proposed project would provide an opportunity to fund the required institutional changes for achievement of climate change adapted conservation of FGR.

- ^a Government of Mongolia. 2012. *Mongolia Law on Forest*. Ulaanbaatar.
- ^b Government of Mongolia. 2015. *Parliament Resolution No. 49: State Policy on Forest*. Ulaanbaatar.
- ^c ADB. 2014. *Interim Country Partnership Strategy: Mongolia, 2014–2016*. Manila.
- ^d Government of the Czech Republic. 2015. *Development of Forest and the Gene Pool of Local Forest Tree Ecotypes in Mongolia*. Prague.
- ^e Government of Germany. 2015. *Biodiversity and Adaptation of Key Forest Ecosystems to Climate Change I & II*. Berlin.
- ^f ADB. 2019. *Country Operations Business Plan: Mongolia, 2020–2021*. Manila.

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DESIGN AND MONITORING FRAMEWORK

Impact		
Resilience of forest ecosystems to climate change increased (Mongolia's 2030 Sustainable Development Vision)		
Results Chain	Performance Indicators with Targets and Baselines	Achievements
Outcome Management of forest seed stands improved	By December 2019: A national registry on forest seed stands implemented by the MET. (2016 baseline: not applicable)	MET adopted an amendment to the national standard on general requirements for establishment of permanent seed stand through the National Committee on Standardization in 2018. MET also adopted a proposal for a national registry system (database) on reforestation and forest seed stands in 2018.
Outputs 1. Forest seed stands within forest regions of Mongolia identified	By November 2018: 1a. Report submitted on identified forest seed regions and seed stands with species, respective seed quality, and yield assessed for conifer and broad-leaved trees. (2016 baseline: not applicable) 1b. Report submitted on identified forest seed regions and seed stands with species, respective seed quality, and yield assessed for conifer and broad-leaved trees. (2016 baseline: not applicable) 1c. Booklet with framework or guideline to assess forest seed yields published by MET. (2016 baseline: not applicable) 1d. Technical guideline or manual on tree seed management (criteria for seed sources, seed collection, seed tree climbing, and seed handling) published by MET. (2016 baseline: not applicable)	1a. A report on assessment of established forest seed stands was submitted to MET. A total of 26 seed stands were assessed, and suitable seed stands were identified. Seed collection, quality, and yield assessment for Scots pine seed trees was completed; and scientific article was prepared and published on February 2020. ^a 1b. A map with identified forest seed regions was completed and presented to the Academic Council of Institute of Geography and Geoecology, Mongolian Academy of Sciences; and was adopted by the Academic Council Meeting on 26 March 2018. 1c. A guideline to assess forest yields was developed and published by MET in October 2018. 1d. A technical guideline on tree seed management was developed and used by the TA consultants in training sessions and published by MET in October 2018.
2. National registry on forest seed stands developed	2a. Proposal for national registry on forest seed stands adopted by MET. (2016 baseline: not applicable) 2b. Proposal for a national standard for the establishment of permanent and impermanent tree seed stands adopted by MET. (2016 baseline: not applicable) 2c. Proposal for a forest seed conservation program using seed storage facilities developed.	2a. A proposal for a national registry on forest seed stands was completed by the TA consultants and submitted to MET in March 2018 for consideration and official adoption. MET formally adopted the proposal and provided permission to change the registry information database. 2b. A proposal for a national standard for the establishment of tree seed stands was completed by the TA consultants and submitted to MET in March 2018 for consideration and was officially adopted by the Mongolian Agency for Standard and Metrology. National Committee approved the standard. 2c. The TA consultants submitted to MET a forest seed storage facilities improvement proposal, which included

<p>3. Educational and research capacities on forest genetic resources established and strengthened</p>	<p>(2016 baseline: not applicable)</p> <p>3a. Training curricula and teaching materials for seven types of teaching materials prepared. (2016 baseline: not applicable)</p> <p>3b. Training conducted in three <i>aimags</i> (provinces) (Khentii, Khuvsgul, and Selenge) with <i>aimag</i> and <i>soum</i> (district) forest unit employees, rangers, tree nursery private company employees, and forest user groups on (i) seed passport certificate elaboration; (ii) seed collection, including by seed tree climbing; (iii) seed treatment, testing, and storage; (iv) seed treatment for sowing; (v) tree nursery activities for different tree species and seedling production targets (e.g., age, dimensions); and (vi) site-adapted use of forest seedlings within afforestation, reforestation, and enrichment plantation activities. (2016 baseline: not applicable)</p>	<p>capacity building of staff in the established national seed storage facility.</p> <p>3a. Training curricula and materials were developed by the TA consultants and shared with curriculum committees of several universities. The National University of Mongolia, the Mongolian University of Life Sciences, and the Institute of Forest Product Research and Training of the Mongolian University of Science and Technology reviewed the curricula and officially gave satisfactory rating.</p> <p>3b. Five trainings were conducted with six modules in all three project <i>aimags</i> for more than 200 participants, with the inclusion of vocational schools. Level 1–2 training of trainers were conducted in 2017; and level 3 training for forest user groups and community forest groups, private vulnerable groups, and low-income households were conducted once in each of the three project <i>aimags</i> between 13 May and 21 June 2018.</p>
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Actual Key Activities with Milestones

1. Forest seed stands within forest regions of Mongolia identified.

- 1.1 Developed the work plan for rapid assessment of forest seed stands in the forest areas of Mongolia (Q2 2017).
- 1.2 Assessed and identified high-quality forest seed stands, including their resilience to climate change, for conifer trees and broad-leaved trees in three forest vegetation regions (Q3 2017).
- 1.3 Analyzed forest seed stands data and prepared the scientific publication of the findings on forest seed regions (Q3–Q4 2017).
- 1.4 Registered and published seed stand site locations for conservation in March 2018 (Q1 2018).
- 1.5 Assessed seed yields and the quality of identified seed stands (Q1 2018).
- 1.6 Reviewed and updated forest seed collection criteria (Q1 2018).
- 1.7 Reviewed and updated instructions on seed tree climbing for seed collection (Q1 2018).
- 1.8 Developed the framework and guidelines for assessment of forest yields and published as a booklet by MET in October 2018 (Q4 2018).
- 1.9 Developed the manual on tree seed management, based on updated forest seed collection criteria and seed tree climbing instructions, and used during training sessions; and published by MET in October 2018 (Q4 2018).
- 1.10 Developed the manual on tree nursery management, based on an assessment of tree nursery practices (seedling processing, storage, and outplanting) in three *aimags* in Mongolia: Khentii, Khuvsgul, and Selenge; and used during training sessions and published by MET in October 2018 (Q4 2018).

2. National registry on forest seed stands developed.

- 2.1 Conducted field studies in three project *aimags* (Khentii, Khuvsgul, and Selenge); and identified constraints, opportunities, and capacity gaps for the conservation of forest seeds (Q2 2017).

Actual Key Activities with Milestones

- 2.2 Reviewed and updated the proposal for the national registry on forest seed stands, and submitted to MET in March 2018 (Q1 2018).
- 2.3 Reviewed and updated the proposal for the national standards for the establishment of permanent and impermanent forest seed stands; and submitted to MET in March 2018 and adopted by the Mongolian Agency for Standardization and Metrology (Q1 2018).
- 2.4 Registered permanent forest seed collection sites and collected seeds (Q1 2018).
- 2.5 Developed the program for conservation of forest seed genetic resources in seed storage facilities (Q1 2018).

3. Educational and research capacities on forest genetic resources established and strengthened.

- 3.1 Developed the training curricula and teaching materials for subject training (Q1 2018).
- 3.2 Developed, in consultation with MET at the central and *aimag* levels, six training modules, the training agendas, and the list of targeted participants for specific training programs (Q2 2018).
- 3.3 Completed conduct of five trainings in all three project *aimags* (Khentii, Khuvsgul, and Selenge) for more than 200 participants, including *aimag* and *soum* forest unit employees, rangers, tree nursery private company employees, and forest user groups, as well as those from vocational schools by June 2018 (Q2 2018).

TA Management Activities

Mobilized team of experts in April 2017 (Q2 2017).
 Developed study framework, prepared the inception report, and conducted the TA inception workshop during 29–31 May 2017 (Q2 2017).
 Prepared the interim TA report and conducted the interim TA review workshop during 17–18 April 2018 (Q2 2018).
 Prepared the draft final TA report (Q3 2018).
 Held the final TA review workshop during 23–24 October 2018 (Q4 2018).
 Finalized the TA outputs by December 2018 (Q4 2018).

Actual Inputs

Japan Fund for Poverty Reduction: \$421,861.23

Government: \$50,000 (estimated in-kind contribution from the government in the form of counterpart staff, office space, office supplies and equipment, administrative support, and other in-kind contributions).

MET = Ministry of Environment and Tourism, Q = quarter, TA = technical assistance.

^a [Mongolian Journal of Biological Sciences 2020 Journal Compilation](#).

Source: Asian Development Bank.

TECHNICAL ASSISTANCE COST

Table A2.1: Technical Assistance Cost by Activity
(\$'000)

Item	Amount ^a	
	Original ^b	Actual
1. Consultants	343.00	331.25
2. Training, seminars, and/or conferences	74.00	62.59
3. Surveys	20.00	28.02
4. Miscellaneous technical assistance administration	25.00	0.00
5. Contingency	38.00	0.00
Total	500.00	421.86

^a Funded by the Japan Fund for Poverty Reduction, administered by the Asian Development Bank.

^b Original estimated cost in the technical assistance report.

Source: Asian Development Bank.

Table A2.2: Technical Assistance Cost by Fund
(\$'000)

	JFPR
1. Original	500.00
2. Actual	421.86
3. Unused	78.14

JFPR = Japan Fund for Poverty Reduction.

Source: Asian Development Bank.