Forest and Landscape Restoration in Mongolia

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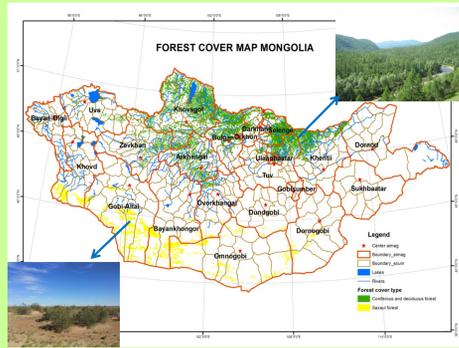
Mongolia is landlocked country locates between Russia and Republic of China and one of the countries in the World which has serious problem with forest depletion, land degradation and desertification. Mongolia unique ecosystems consisting of Northern parts of Central Asia and Southernmost distribution of Siberian taiga forest and elaborate extreme climate and arid zone with precipitation deficit. An average annual air temperature of Mongolia has increased by 2.14°C during the last 70 years with certain fluctuations (MNET 2009). As a consequence, drought covering around 25 percent of the country occurs once in 2-3 years and around 50 percent occurs once in 4-5 years, and number of dust-stormy days tends to increase by 3-4 times according to observation.

Forest of Mongolia covers two distinct regions: the Northern boreal forests and the Southern Saxaul forests in the arid desert regions. Forest cover in Mongolia accounts 18,5 million ha, consisting of 12,3 million ha of boreal forests and 5,6 million ha Saxual forests accounting for 11.8% of the total land area (Forest Research and Development Center, 2016).

Desertification refers to the persistent degradation of dryland ecosystems by climatic variations and human activities. It occurs on all continents (except Antarctica) and affects the livelihoods of millions of people, including a large proportion of the poor in drylands. Desertification is a significant global ecological and environmental problems. The results of desertification assessment in 2015 indicate that 76.8% of country's total land is affected by some degree of desertification, including slightly 22.9% of land were affected severe and very severely desertified (State of Environment of Mongolia, 2017). Hence, desertification and land degradation in Mongolia has reached at the national security level (Desertification atlas, 2013).
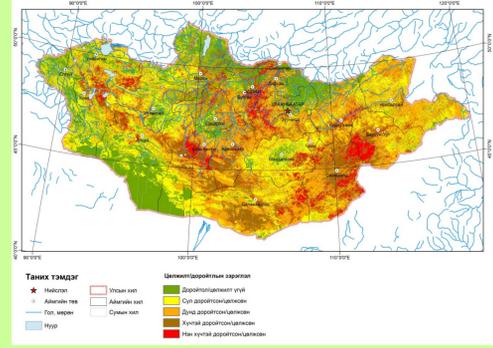
Thus, numerous activities for forest restoration and land rehabilitation had been conducted in Mongolia, but many of the restoration and rehabilitation activities shown poor results due to natural reason, such as harsh climate, and lack of understanding of the ecological characteristics and research capacity. This paper aimed to cover achievements of forest restoration and combating desertification projects conducted recently in Mongolia and to identify the attributes promoting its success in different projects at different part of Mongolia. The success story of northern coniferous forest restoration in Tujiin Nars area and Southern restoration Saxaul forest restoration and reforestation researchers will be introduced. According to researches on restoration and rehabilitation, water (precipitation) is one of the limiting factors which affect planted seedling growth survival in Mongolia and prevention from of livestock grazing and forest fire is also another important factor. For successful rehabilitation of degraded forests or arid southern conditions of Mongolia, standard techniques for species selection and improvement of rehabilitation effects should be integrated in silvicultural treatments and molecular genetics techniques for increased water use efficiency and stress tolerance is needed.

Case study: Restoration of Degraded forest lands in Northern Mongolia, Tujiin nars forests, Selenge province
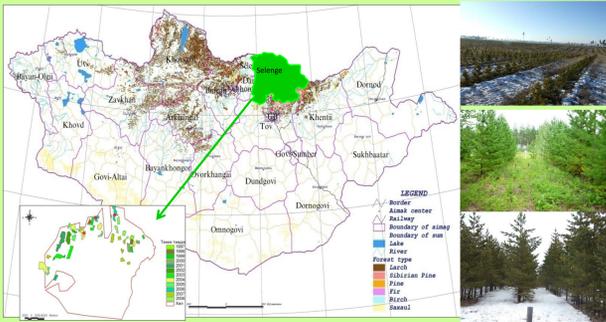
• The investigation was carried out in Scots pine forest, located in Northern part of Mongolia.
• Due to frequent forest fires and over exploitation, Tujiin nars has depleted sharply during 1960-2000.
• The Government of Mongolia started Nationwide Restoration Campaign started 2001.

• According to statistics, over 19.0 thousand ha degraded forests are restored between 1971 to 2011 and currently, almost all of the forest area, which was destroyed in the past has been reforested successfully.

2003 plantation
- Total area: 100ha , Scots pine
- survival rate: 90%
- Average height: 1.9m

2004 plantation
- Total area: 150ha , Scots pine
- survival rate: 80%
- Average height: 1.7m

2005 plantation
- Total area: 250ha , Scots pine
- survival rate: 85%
- Average height: 1.5m

2006 plantation
- Total area: 250ha , Scots pine
- survival rate: 70%
- Average height: 1.2m

Case study: Reforestation and Combating Desertification Activities by Korea-Mongolia Joint "Green Belt" plantation project in dry regions of Mongolia

In 2005, the Government of Mongolia had initiated the National Programme named "Green Belt" in the south of the country. The objective of this programme was to create a belt of planted trees in the transitional zone between the Mongolian Gobi and steppe regions in an effort to reduce the present intensification of loss in forest resources, desertification, sand movement and dust and sand storms caused by climate change and inappropriate anthropogenic activities. Species selection with tolerance to drought, cold, salt and other natural and anthropogenic impacts are important for success of tree planting especially in arid and semiarid regions of Mongolia.

Forest plantation in Dry-steppe regions of Central Mongolia

Forest plantation in Semi-desert regions of Mongolia

Saxaul forest plantation in Gobi desert of Mongolia