

Agroforestry amelioration for rehabilitation of degraded land

AGROECOSYSTEM:
Irrigated



BENEFITS

- Restoration of the abandoned land by a simple method;
- The technology is based on traditional methods of cultivation of tree crops (local tree species are used);
- Tree plantations are established with little irrigation rates;
- Provides cheap and ecologically clean means of coping with waterlogging through biodrainage;
- Multi-purpose orientation: ecological benefits are: a carbon sequestration, improvement of soil quality, economic: source of fuel and construction wood, additional source of fodder to cattle.

Definition of technology:

Plantation of salt-tolerant tree species, mainly with nitrogen-fixation and high bio-drainage capacities is established on arable areas unused due to a strong salinization and waterlogging.

Brief summary of technology:

There are many sites of the degraded arable land in Uzbekistan, the use of which is unprofitable for production of the main crops. Planting of multi-purpose tree species on such land promotes restoration of soil fertility and their use for agricultural production. Abandoned land starts to bring benefits, providing the population with fuel and construction wood, cattle with a deciduous forage, etc. The well-

considered selection of tree species provides ecological services, such as decrease of water-logging through a biodrainage and control of soil salinization; nitrogen-fixation capacity of certain species enriches the soil with nitrogen, and litter from leaves with humus. These sites can again be turned to a category of an arable land or to continue to use them for wood production in a long-term perspective.

The selection of multi-purpose tree species for set of criteria, main of which are salt and drought resistance, biodrainage and nitrogen-fixation capacity is the main considerations to establish forest plantations on marginal land. For conditions of the Khorezm province, nitrogen-fixation species

such as Russian olive (*Elaeagnus angustifolia*), fast-growing species Asiatic poplar (*Populus euphratica*) and long life species Siberian elm (*Ulmus pumila*) are recommended.

The land preparation is traditional (planning, plowing, leaching). Saplings of various species are planted in clean rows by a 1x1.75 m scheme, with alternation of species in each 5-7 rows. Dense tree stand allows to collect a biomass for fuel and a forage by a thinning. When the width of inter-row increases to 3-5 m, the biomass is received by rational by dehorning. Irrigations are carried out within the first 2 years with reduced rates (by 10-30%), a later the trees get nutrition at the expense of groundwater.

Main land use issues and the main causes of land degradation:

Natural preconditions and land and water mismanagement caused waterlogging and a secondary soil salinization and land abandonment from agricultural production. Restoration of the saline marginal land with traditional methods of leaching is difficult and expensive.



Main technical features of technology:

Improvement of an soil cover, increase of organic matter, nutritious elements, restoration of soil fertility; a sequestration of carbon dioxide in a biomass and the soil.

Acceptance/adoption of technology:

The technology is implemented within ZEF/UNESCO/UrSU Project. Financial support is required for the wide dissemination. Probably, land leasing does not stimulate farmers to invest in long-term prospect. Farmers do not have sufficient understanding that abandoned land can bring benefits in a near future, already during the first 3-5 years. Promotion of this method is necessary.

CACILM Factsheets

These factsheets are designed to promote proven and sustainable interventions to improve land management in Central Asia. The technologies and interventions highlighted are generated by the IFAD-funded project on Knowledge Management in Central Asian Countries Initiative on Land Management. The initiative's Knowledge Platform, managed by ICARDA, aims to disseminate solutions to rehabilitate and prevent the further degradation of Central Asia's natural resources.

This factsheet was produced using information provided by the World Overview of Conservation Approaches and Technologies (WOCAT).

Contact:

A.Akramkhanov@cgiar.org, Project Coordinator, Knowledge Management in CACILM II

www.cacilm.org

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