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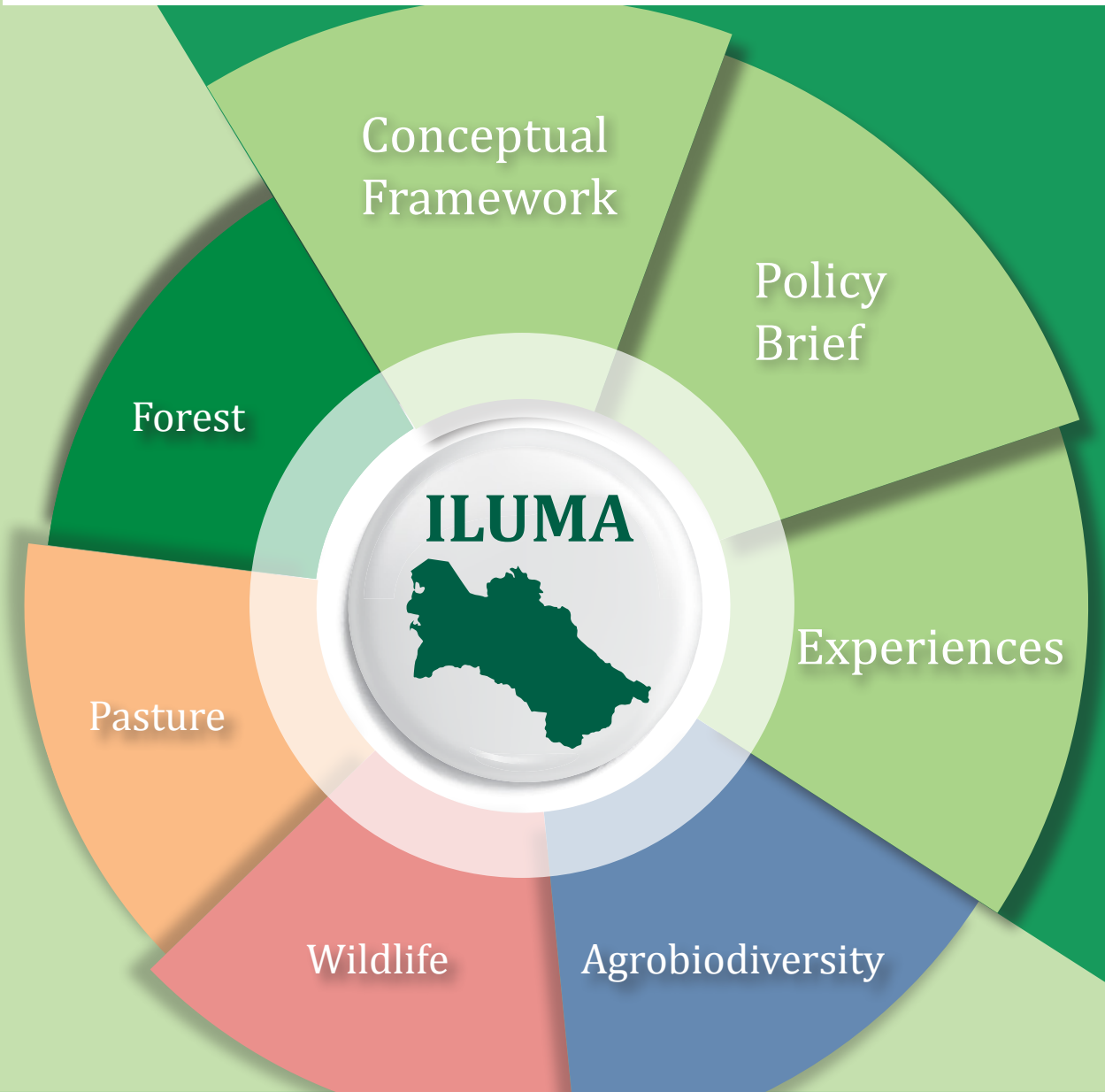
Integrative Forest Management in Turkmenistan for Integrative Land Use Management Approaches (ILUMA)



Integrative Forest Management

for Integrative Land-Use Management Approaches (ILUMA)

Forest Management

Strengthening the forestry sector for sustainable landscape management

1. What is this land use practice about?

Turkmenistan is a desert country which is very vulnerable[1] to the impacts of climate change. Negative consequences that are already apparent could become even more critical over the next few decades. The great Karakum Desert that covers around 80% of Turkmenistan has harsh, dry climatic conditions and the mountain ranges situated in the country's southern and eastern regions are also highly arid. With low mean annual rainfall (varying from 80 mm in the desert area to 300 - 400 mm in mountainous regions) and summer temperatures of over 50 degrees Celsius, Turkmenistan is very sensitive to changes in temperature, evapotranspiration and precipitation.

The predominant land use in deserts and mountains is extensive livestock production. Although livestock densities are relatively low (one sheep per 2 to 30 hectares), the animal numbers are growing fast and are now considered too high for the environmental conditions, risking further resource overuse. Forest resources in the desert and mountains are already severely affected by uncontrolled grazing, leading to forest degradation and deforestation. In addition, climate change is causing a wide range of negative impacts on forests through intense and persistent droughts and unpredictable rainfall patterns, leading to desertification of vast areas.

Forests are an important natural resource for the country and in particular for the rural population. They provide environmental services such as dune fixation and wind breaks, which are crucial for protecting transport and water infrastructure, reducing land degradation (both in desert and mountain areas) and obstructing sandstorms. Moreover, trees have balancing effects on the local climate, provide shade for domestic animals and goods and materials for the local populations and their livestock.

Restoring and protecting forests and increasing forest cover is, therefore, of vital importance for the process of strengthening resilience and adapting to climate change.

Thus, there is a need to manage forest resources in a different way. Sustainable forest management is a feasible way to (a) mitigate negative impacts of climate change by fixing carbon and regulating local climate; (b) increase natural forest cover; (c) by the latter, reduce the likelihood and intensity of expected hazards through fixing moving sands, reducing soil erosion, adding organic matter to the soil and protecting the population against sandstorms; (d) ensure biodiversity conservation by planting and regenerating native tree species, well-adopted to local conditions; (e) provide fodder, medicinal plants, firewood and other resources to local populations; (f) ensure institutional sustainability of the undertaken measures via involvement of the Forestry Administration and local authorities; (g) anchor newly developed management approaches in the national legislation, including the Forest Code of Turkmenistan.

The Government of Turkmenistan acknowledges the need for action and undertakes several measures through implementing the National Forestry Program (2012-2020) and the National Strategy on Climate Change (2012-2018, 2019-2030).

The experience of GIZ (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH / German Development Cooperation) has shown that measures to strengthen the capacities of forest authorities and forest users to plan, implement and monitor sustainable forest management works best if local communities and local authorities are actively involved. Applying this participatory approach and investing in capacity building, the implemented measures can improve the probability for successful restoration of degraded forests. Additionally, biodiversity conservation within the framework of forest management, is yet another important element for long-term sustainability of management measures.

The presented experiences in this document are related to two processes, which were both supported by GIZ within different projects and at different times:

- The Cornerstone 1 about the process of developing Turkmenistan's Forest Code and respective bylaws was supported by GIZ from 2011 to 2015, partly in the framework of the EU project on Forest and Biodiversity Governance including Environmental Monitoring (FLERMONECA), which was implemented by GIZ.
- The description of experiences related to forest management in Cornerstones 2 and 3 and key principle 3 in Cornerstone 1 is related to the project "Sustainable Forest Management" that was implemented between 2008 and 2011.

[1] https://www.ipcc.ch/apps/njlite/srex/njlite_download.php?id=6235

2. Cornerstones of Forest Management

Successful forest management requires a multi-level (i.e. different administrative levels of governmental structures) and multi-dimensional (i.e. taking into account the holistic nature of land use management) approach. Piloting integrative forest management approaches based upon restoration, conservation and provision of goods and services is as important as supporting appropriate forest governance and management structures which enable sustainable forest use planning and monitoring.

Forest-based economic development that entails the sustainable use of forests for pasture, agriculture, horticulture and sericulture provides the opportunity to take advantage of economic incentives to promote sustainable management approaches among the local population and forest management institutions.

The most important 'cornerstones' regarding the land use practice 'forest management' in Turkmenistan are:

- Forest Governance
- Forest Protection and Restoration
- Sustainable Forest Use

The icons used in the cornerstones of this document refer to the different dimensions of the "Integrative Land Use Management Approach (ILUMA)". The ILUMA Conceptual Framework[2] describes all dimensions related to land use management. They are organized in such a way that they can be used for different purposes: for stakeholders developing a common approach on land management, developing sector policies or program planning and monitoring. ILUMA is based on land use practices that were piloted and tested in Central Asia for more than 12 years.

Symbol	ILUMA dimension	Symbol	ILUMA dimension
	**Competence Development:** strengthening core competencies of key stakeholders for better performance.		**Knowledge Management:** improve knowledge management and foster ongoing learning so as to better adapt to change.
	**Planning and Monitoring:** adequate planning, management, and monitoring instruments, structures and processes.		**Organisational Development:** strengthen and develop effective organisations and performance-based organisational mechanisms.
	**Socio-cultural Relations:** deploy social relations and culture as strong foundations for integrative land use management.		**Institutions and Institutionalisation:** build strong institutions and institutionalise core processes.
	**Economy and Financing:** emphasize economic viability and foster economic development by sustainable investments.		**Environmental Conditions:** consciously know and integrate environmental conditions and functions in land use management.

[2] https://www.landuse-ca.org/?page_id=8467&lang=en

In the table below we describe each cornerstone in more detail, elaborating how each relates to these ILUMA dimensions.

Cornerstone 1: Forest Governance

<table>
<tr><td>GIZ Experience for Implementation</td><td colspan="2">Forest Sector Reform in Turkmenistan:

In 2009, the “Green Belt” Joint Stock Company, an organization that carried out forest management responsibilities, was dissolved. Starting in April 2009, those responsibilities were transferred to the Ministry of Nature Protection (MNP). This created the preconditions for the modernization of Turkmen forest legislation, and an opportunity for GIZ to support its national partner to ensure that new forest legislation properly addresses sustainable forest management and climate change related issues.

Even though the responsibilities for forest management in Turkmenistan were transferred to the MNP, a comprehensive state forest administration with qualified and dedicated personnel and clear responsibilities over all forest areas were still missing. Consequently, powers and jurisdiction over forest areas urgently needed clarification.

Forests in Turkmenistan are state property. Municipalities or private individuals had no legal basis to participate as beneficiaries in sustainable forest management. While working on the reform of the national legislation, GIZ tried to legally anchor the municipalities as forest management partners.

Therefore, the Environmental Agency and other partners were supported in modifying the Forest Code of Turkmenistan (last amended in 2018) so that (i) it reflects international sustainable forest management standards, and (ii) it is consistent with international climate change initiatives.

The below delineated Key Elements 1 and 2 are related to the process of developing the Forest Code and respective bylaws from 2011 to 2015, whereas the description of local governance mechanisms is based on the experiences made in the context of the project “Sustainable Forest Management”, implemented from 2008 to 2011.</td></tr>
<tr><td></td><td colspan="2">Reference material:

- GIZ Project “Sustainable Forest Management” (11/2008 – 06/2011): Report on the Second Assignment by Dr. Joachim-F. Kirchhoff, June 2009.
- FLERMONECA Project (2013-2015): Mission Report on Development of Forest Sector Regulations by H. Foellmi / S. Stoll, July 2015
- Turkmenistan Forest Code (25/03/2011): http://minjust.gov.tm/mcenter-single-ru/32 (full text in Russian with all Amendments of 2015, 2017 and 2018)</td></tr>
<tr><td>Key Elements of the Experience</td><td colspan="2">Guiding Principles and the Way How They Are Related to ILUMA Dimensions</td></tr>
<tr><td rowspan="2">Adjusting the National Forest Code

Consideration of international sustainable forest management standards in national legislation.</td><td>  </td><td>• Conduct surveys and consultations of local population and other stakeholders, to understand the situation and needs in practice
• Strengthen the capacity of the municipality and local forestry administration (leskhoz) in order to promote local interest in sustainable forest management by discussion of the bylaw drafts in workshops at the pilot level and support for coordination amongst stakeholders</td></tr>
<tr><td>  </td><td>• Facilitate meetings and workshops, as well as setting up a Working Group (WG) composed of national and international experts. In the case of Turkmenistan, the WG was composed of a national lawyer, representatives from MNP, National Institute of Deserts, Flora and Fauna, protected areas, Forestry Administration lawyers, archins (heads of local administration of the territorial unit) and international experts
• Deliver inputs including written concepts, advice by forestry experts from abroad and study tours of Turkmen foresters to forestry administrations in other countries, in order to entrench the Forestry Administration under the MNP</td></tr>
</table>

		• Check whether the national regulatory framework fulfils international standards for sustainable forest management • Provide recommendations and provisions on adaptation of the Forest Code, in particular regarding land use rights, land tenure for individuals, households and communities • Anchor municipalities legally as forest management partners along with local communities by changing the framework conditions and promoting local interest in sustainable resource use at the national level
		• Integrate mechanisms for sustainable forest management into the Forest Code, meeting international standards • Ensure the consistency of the new Forest Code with international climate change initiatives
Development of bylaws For operationalizing the National Forest Code, a set of bylaws and regulations have to be developed		• Organise and facilitate working groups to develop or improve bylaws, guidelines and regulations • Conduct a consultation of the bylaw drafts by relevant stakeholders to ensure that all important elements have been considered and the bylaws respond to the demand and are based on realistic assumption • Enable partner structures to implement the Forest Code based on the developed bylaws and regulations (future work)
		• Integrate knowledge of local people in developing practice-oriented bylaws, regulations and guidelines • Make use of the experience of local foresters on managing forest resources • Integrate the knowledge of external experts
		• Monitor institutional and legal changes to build opportunity for development and adoption of the bylaws with the MNP (presently the Ministry of Agriculture and Environment Protection) • Prepare Proposal for a Standardized Development Procedure for Bylaws to ensure an effective and efficient process • Focus on strengthening organizations to implement Forest Code (future work)
		Elaborate those bylaws that are necessary to implement the Forest Code in practice. According to the Turkmen experience, the following 11 draft bylaws to the Forest Code were prepared: • Rules on implementing state registration of the Forest Fund; • Rules for conducting state monitoring of forests; • Rules for maintaining the state forest cadaster; • Regulation on non-essential use of forests; • Regulation for “wood cutting” including forest harvesting, forest regeneration, removing old trees, etc.; • Instructions on the forest seed bank; • Payments for the use of the Forest Fund and the procedure for collecting them; • Rules for reforestation and afforestation activities; • Regulations on the State Forestry Protection organization; • Procedure for determining the loss of forest production subject to indemnification and caused by requisitioning of the Forest Fund’s lands, not related to the forestry management; • Guidelines to determine losses of forestry production caused by the seizure of the Forest Fund lands and calculation of damage due to violation of the forest legislation.

Establishing local governance mechanisms At the local level different forest governance mechanisms were developed and tested.		• Train all relevant actors in order to ensure that they understand their role in the sustainable forest management (SFM) • Facilitate meetings of local people involved in reforestation and forest management measures
		• Establish groups of community members at the local level in order to address forest resource management and coordinate forest-related issues • Establish SFM exchange meetings for coordination between different stakeholders: groups of local community members, municipalities, local forestry administration, State Nature Reserves • Include local government authorities (municipalities) and archins in forest management coordination
		• Engage local leaders to organise community members for forest management measures • Embed groups of local community members in existing structures of farmer associations

Cornerstone 2: Forest Protection and Restoration

GIZ Experience for Implementation	**Piloting of forest protection and restoration measures:** Forest resources in Turkmenistan are being threatened by several factors, which in combination led to forest degradation and affect people's livelihoods. The two main threats are climate change and overgrazing. The results of climate change for trees are higher moisture stress and higher mortality, especially for seedlings. Thus, both natural regeneration and reforestation (without irrigation) become more difficult and their failure can lead to further desertification. In mountain and desert areas the number of livestock has increased substantially during the past few years. Grazing animals (camels, cows, sheep and goats) create high pressure on the natural vegetation, including trees - and impede regeneration. If forests, or newly planted areas are left unprotected, overgrazing will eventually destroy the forest's capacity to regenerate, with a resulting decrease in forest cover already evident in many areas of Turkmenistan. Under the GIZ SFM Project (2009-2011) 200 hectares of forests were established in desert and mountainous areas. Under the GIZ SLM Project (2008-2011) 100 hectares of juniper were replanted in the village of Nokhur, Central Kopetdag and 20 hectares of saxaoul in the Karakum Desert. Under the IKI Amu Darya project (2019-2020) an additional 10 hectares of Tugai forests were planted in the vicinity of the Amu Darya River.
	Reference material: - GIZ Project "Sustainable Forest Management" (11/2008 – 06/2011): Interim report to BMU, July 2009 - GIZ Project "Sustainable Forest Management" (11/2008 – 06/2011): Report on the Second Assignment by Dr. Joachim-F. Kirchhoff, June 2009 - GIZ Project "Sustainable Forest Management" (11/2008 – 06/2011): Final Report: Rehabilitation Design for Chalysh, Yzgant, Yangala (Annexes 1, 2, 3) by Hessen Forst - SLM in Konegummez village, PANORAMA Solution - https://panorama.solutions/en/solution/sustainable-land-use-management-konegummez-village-turkmenistan (2019)

Key Elements of the Experience	Guiding principles and the way how they are related to ILUMA dimensions	
Planning for restoration and protection Restoration of degraded forests and protection of forest resources require a sound planning, involving all relevant stakeholders.		• Train all relevant actors – local people and authorities, municipality staff, leskhoz staff and Forestry Administration officials – in planning techniques for forest restoration and protection • Trainings and seminars for pilot areas consider the forest management plan to introduce sustainable and affordable measures to establish and manage nurseries
		• Introduce innovative ideas concerning the restoration of degraded vegetation • Consider local knowledge of restoration and protection measures that work • Include other supplementary activities (sowing, collection of wildlings, enrichment planting and inclusion of existing natural regeneration) in the restoration planning process • Examine available technologies and replace obsolete technologies of seed production after having established a seed center (nearby Yzgant pilot site at the premises of local forestry administration (leskhoz); central nursery was established next to it)
		• Determine the location of the pilot sites where restoration and protection measures will be carried out, while considering their accessibility / vicinity to the settlements, nature reserves or leskhozes; these factors are important for controlling and monitoring purposes • Explore the availability of water as an important factor for establishment of nurseries within or nearby pilot sites • Plan the use of existing infrastructure (building, warehouse) to monitor and manage the measures including the decentralized nursery • Prepare specific and detailed restoration and protection plans for each pilot site to restore the capacity of degraded forest land aimed at delivering forest products and service • Ensure that planning and monitoring activities are included in the management plan
		• Support engagement of community groups in forest management, including restoration and protection measures
		• Consider support from the local population with regard to carrying out restoration and protection measures. These measures contribute to mitigate land use conflicts • Solicit support from the heads of the farmers' associations, State Nature Reserves on the territory of the pilot areas • Consider that local authorities play a key role on issues related to land use
		• Ensure availability of sufficient natural regeneration (wildlings) and its consideration in the restoration design • Explore soil composition: severely degraded (salinized) land or bare and eroded land to be restored

Implementing restoration and protection measures Engaging local people in direct and indirect measures to restore and protect forests.		• Deliver training of all participating forest users in planting, management and protection of plantations • Implement capacity building of guards from the Forestry Administration on protecting the area from grazing and poaching • Ensure that the Pasture Management Concept is introduced and practiced within the pilot sites to reduce the grazing pressure in general, and in particular in the areas foreseen for restoration • Provide consultation on impact and planning of sand dune fixation • Deliver training with respect to sand dune fixation techniques to forest users and leskhoz staff • Make local communities aware of what benefits forest rehabilitation offers them by introducing new perspectives that would convince them to reduce the livestock • Educate the local population on the effectiveness of alternative energy sources and the negative effects of excessive consumption of saxaoul wood for cooking
		• Improve local sand dune fixation practices through the integration of regional and international knowledge and experience • Ensure that knowledge and opinion of local people is considered and further well-integrated in restoration and protection measures
		• Place fencing around forest plots to protect planted trees against livestock • Plan focusing on protection of the area, biodiversity management and enrichment planting/sowing (some 70 hectares for Yzgant pilot area) • Consider irrigation for planted trees during the first 2 years, until they have developed an appropriate root system and do not require further irrigation • Include surveillance system (guards) in the management planning or contract guards to protect forest plantations • Consider alternative energy sources to replace the use of saxaoul consumption in important facilities, such as schools
		• Cooperate with Ministries and other governmental agencies to increase capacity of local authority and promote better understanding of SFM objectives in the region • Increase the productive capacity of nurseries to provide high-quality trees, including technical improvements: introduction of seed collecting, processing, and storing technology. This requires adapting the organisation of the nurseries including: clear job descriptions of staff, establishment of organisational units within the nursery (e.g. for seed collection / acquisition and storage, sowing of tree seeds, construction and maintenance of infrastructure such as irrigation, etc.), defining mid-level management functions and working processes
		• Involve local population, local leaders and authorities in forest restoration and protection activities and also in sand dune fixation

		• Envisage the provision of incentives to stimulate the local population to reduce the number of livestock; thus, pilot areas of Bokurdak and Nokhur, most vulnerable to grazing pressure, were provided with incentives in form of fruit trees that provide additional income to villagers • Consider payments of local labour force to establish forest plantations and fencing
		• Use existing protective elements, such as already established fences or agricultural plots • Envisage plantation of local species that only need irrigation during the first 2 years after planting (black and white saxaoul for desert areas; juniper, pistachio and almond for mountainous areas

Cornerstone 3: Sustainable Forest Use

GIZ Experience for Implementation	**Sustainable Forest Management:** In 1998, the Government of Turkmenistan launched the National Forestry Programme. The main objective of the programme is to mitigate drought impacts, improve microclimate conditions and prevent land and soil degradation. Reforestation is seen as a technical tool to mitigate desertification, to safeguard biodiversity, and to sequester and fix atmospheric carbon. The re-establishment of forests in Turkmenistan requires tremendous efforts in planting, logistics and subsequent maintenance. For reforestation, GIZ pursued an important strategy for all pilot areas, namely the promotion of native tree species that do not require regular irrigation (black saxaoul, white saxaoul, cherkez, juniper, pistachio, almond). Those species are watered once immediately after planting and again in spring when dry weather conditions make it necessary. Thereafter, the trees should be able to survive and grow with the natural rainfall and groundwater. Reforestation reduces pressure on remaining forests and helps to meet local community needs for firewood and fodder without degrading the forest areas. Under GIZ SFM Project (2009-2011) 200 hectares of new forests have been established in desert and mountainous areas. Under GIZ SLM Project (2008-2011) 100 hectares of juniper were replanted in the village of Nokhur, Central Kopetdag and 20 hectares of saxaoul in Karakum Desert.
	Reference material: - GIZ Project "Sustainable Forest Management" (11/2008 – 06/2011): Consultancy report by Carsten Wilke, 2009 - GIZ Project "Sustainable Forest Management" (11/2008 – 06/2011): Interim report to BMU, July 2009 - GIZ Project "Sustainable Forest Management" (11/2008 – 06/2011): Presentation by Hilmar Foellmi, 2009 - GIZ Project "Sustainable Forest Management" (11/2008 – 06/2011): Report on the Second Assignment by Dr. Joachim-F. Kirchhoff, June 2009 - GIZ Project "Sustainable Forest Management" (11/2008 – 06/2011): Community-based Sustainable Forest Management Plans (SFMP) for three pilot areas: Chalysh (desert area), Yzgant (sand massive) and Yangala (mountainous area) - UNDP: An Overview of Development Support to Turkmenistan: Capacity-Building and On-the-Ground Investments for Sustainable Land Management (SLM) (pp.34-35), October 2012 - FLERMONECA Project (2013-2015): Mission Report on Development of Forest Sector Regulations by H. Foellmi / S. Stoll, July 2015

Key Elements of the Experience	Guiding principles and the way how they are related to ILUMA dimensions	
Community-based Sustainable Forest Management Plan (SFMP) Develop 10-year SFMP together for mountain and desert forests and 5-year plan for Tugai forests of the Amu Darya River in collaboration with local authorities, community members and government officials		• Strengthen the capacity of local authority and local communities in the reforestation activities and sustainable use and management of forest resources through trainings and seminars • Training and seminars for pilot areas consider the forest management plan to introduce sustainable and affordable measures to establish and manage nurseries • Examine available technologies, replace obsolete technologies of seed production after establishing the seed center (nearby Yzgant pilot site at the premises of leskhoz; central nursery was established next to it) • Ensure that capacity development of state forest management institutions is in place • Strengthen cooperation at organizational and individual levels
		• Increase visibility of the reforested sites by the means of introducing information panels around the area
		• Prepare specific and detailed rehabilitation plan for each pilot site to restore the capacity of degraded forest land aimed at delivering forest products and services • Implement rehabilitation measures (sowing, protection of natural regeneration, collection of wildlings) • Ensure that planning and monitoring forest management activities are included in the management plan
		• Establish SFM exchange meetings for coordination between different stakeholders: groups of local community members, municipalities, Forestry Administration, State Nature Reserves
		• Involve actively the local population, leaders and authorities in developing the SFMP • Ensure that knowledge and opinion of local people are considered in developing the plan • Consider potential land-use conflicts during planning • Get support from the heads of the farmers' associations, State Nature Reserves for piloting activities related to reforestation and forest use • Consider that local authorities play a vital role in SFM and in accelerating reforestation activities
		• Consider the economic means of local communities and the potential for support from local authorities and Forestry Administration for forest management measures • Consider payment of the local labor force for establishing forest plantations and fencing

		• Use of the following tree species is recommended: black saxaoul, white saxaoul and cherkez for deserts and juniper, pistachio and almonds for mountain areas; these species are irrigated during the first 2 years after planting; thereafter, the trees are able to survive and will get water by natural rainfall and groundwater • Arrange preparation seeds for the planting season (harvesting from mother trees); saxaoul mother trees are selected and marked to ensure frequent and abundant production of seeds to cater for future reforestation demand • Increase capacities of nurseries, including the technical improvements: introduction of seed collecting, processing, and storing technology • Establish small decentralized nurseries in the selected plantation areas to cater for the planting demand • Ensure that the central nursery delivers seedlings to the small nurseries right after germination
Local community member groups Members can jointly organize work to improve their forest infrastructure and monitor the fulfilment of Annual Plans, as well as solve conflicts between forest users or with other stakeholders (livestock owners)		• Train group members regarding the roles and responsibilities they assume in the SFM • Provide appropriate training to community member groups that carry out planting activities in accordance with the management plan, e.g. planting of trees, watering / irrigating during first 2 years, establishing small-scale nurseries, protection by fences, guarding • Make local people aware of the benefits of the SFM
		• Establish local community member groups for addressing forest management and coordinating forest-related issues, as, for instance, forest use, forest protection and product harvest • Embed, if appropriate, local community member groups in existing organizational structures, as farmer associations, for example • SFMP has to be incorporated into local, regional and national planning and programs. This requires a clarify roles and responsibilities of those involved in the SFM
		• Engage local leaders and heads of communities to organize the groups • Identify existing land use conflicts in the community • Consider local traditions when setting up local community member groups, as it is a key for success

Future Outlook

Sustainable Forest Management Planning

The experience of the "Sustainable Forest Management" project of GIZ in three pilot sites proved that it is feasible to implement sustainable forest management in Turkmenistan. Key elements are community-based sustainable forest management plans (SFMP) and the collaboration and active participation of all interested stakeholders, as, for instance, representatives of the line Ministries or the State Forestry Administration, local authorities and community members. An important prerequisite for the successful implementation of the community-based SFMP is its incorporation into local, regional and national planning and programs. Once this is the case, the required human and financial resources can be made available for the planned activities. If the SFMP forms part of planning at community, regional and national level, it will also be possible to assign clear responsibilities and to hold the respective agencies or organizations accountable for the outcomes. Capacity development and awareness raising of all involved parties are crucial issues in this respect. Therefore, it is highly recommended to promote the inclusion of the SFMP into the above-mentioned country-wide strategic planning.

Establishing a Forest Seed Bank

As this paper reveals, serious efforts and investments were undertaken to promote sustainable forest management measures at different levels and dimensions in Turkmenistan. Despite positive results, it is worth noting that there are still various issues, which need further efforts to tackle important challenges of the forestry sector. One such central issue is the restoration of the tree species Juniperus turcomanica (common name: Archa), which is an endangered, endemic and autochthonous tree in the Kopetdag Mountain Range. Archa tree cover has decreased by 30 to 40% in the last fifty years due to uncontrolled grazing and changing climate patterns. The latter issue has resulted in the degradation of seed quality, so that only those trees at higher altitudes still produce viable seeds. Both national partners and GIZ, consider establishing a seed bank for endemic trees and capacity development of technical staff as an important step for promoting forest restoration and protection. If Turkmenistan continues aiming at increasing carbon sequestration capacity by means of sustainable forest management (through establishing plantations at large-scale as in the past decade), an important precondition for success would be the establishment of a seed center.

Forest Inventory

Forest management requires a sound database of forest resources. Also, knowing the present state of the country's forest resources is important for understanding past changes in forest development and for future planning at national, regional and local scale.

Thus, there is a need for a national forest inventory. According to FAO, no national statistics related to forests are available for Turkmenistan. Currently, estimates on forest areas vary largely. As Turkmenistan reported to FAO in the framework of the Global Forest Resource Assessment 2015, 8.8% of the country is covered by forests. But satellite image interpretation shows that only 0.06% is forest area. Hence, obviously there is a need to define what is considered as a "forest", according to internationally accepted standards, and carry out a respective assessment.

The outcomes of a national forest inventory are also the basis for developing the National Forestry Programme.

Ratification of Forest Bylaws

In order to adapt to increasing droughts, improving microclimatic conditions and preventing land and soil degradation, over the last ten years Turkmenistan has successfully implemented the National Forestry Programme (2012-2020), an essential part of which was devoted to the reforestation around Ashgabat, Avaza Tourist Zone, and the areas suffering from the consequences of drying out of the Aral Sea. The National Forestry Programme also supported the implementation of forestry sector reform, including elaboration of the National Forest Code, and a set of bylaws for its operationalization. GIZ has closely collaborated with the governmental Environmental Agency during the entire process of implementing the National Forestry Programme in the framework of different GIZ and EU projects, and to this end reached tangible results. However, legal reforms are still underway. Although the Forest Code and subsequent amendments were adopted, it is important to note that the process of adopting the bylaws takes time. Thus, the bylaws draft prepared with expert support from GIZ are yet to be confirmed, tested and adopted in practice.

Actualizing the National Forestry Programme

Currently, Turkmenistan is developing the National Forestry Programme for the next period 2021 - 2030. It will incorporate central aspects of the National Strategy for Climate Change with regard to climate and the forestry sector of Turkmenistan, including various types of endemic forests (saxaul, tugai, juniper and others), as well as fast-growing exotic and ornamental species used in urban areas and recreational zones.

The integration of SFM experiences and the promotion of reforestation of endemic species at large scale are recommended to be central aspects of the future National Forestry Programme.

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