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Queen Elizabeth Is.
Arctic Circle
Nuuk (Godthåb)
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UNITED STATES
CANADA
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Ottawa
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ATLANTIC OCEAN
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Drake Passage
ANTARCTICA
ROSS SEA
BELLINGSHAUSEN SEA
Antarctic Circle
PACIFIC OCEAN
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MARSHALL IS.
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Nouméa
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Wellington
LEGEND
Capital
Continental boundary
Undefined
International boundary
Regional boundary
Military demarcation line

Map of the Asia


Ulaanbaatar
MONGOLIA
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Huang He
YELLOW SEA
S REPUBLIC OF CHINA
EAST CHINA SEA
Chang Jiang
SOUTH CHINA SEA

Foreword

Strong social, economic and cultural connections exist among economies across Central and Northern Europe, Central Asia, the Middle East, North Africa and Greater Central Asia (GCA). The GCA region, in the widest sense, encompasses Kazakhstan, Tajikistan, Uzbekistan, Turkmenistan, Kyrgyzstan, Mongolia and western China and harbors unique biodiversity. Various species of fauna and flora mingle with endemic species not found elsewhere.

Forests in this region are vital natural resources that provide important environmental services including climate regulation, soil protection, clean water supply and many more. They also play a leading role in socio-economic development, supplying people with food, fuel, medicinal plants and recreational areas. Meanwhile, forests are suffering the effects of increasingly severe land degradation and desertification due to a host of natural and human factors. The most significant of these factors include overgrazing, land clearing for agricultural use, illegal logging and poaching, firewood collection, excessive water consumption, and insufficient financial and technical support.

Economies in GCA are actively involved in international and regional commitments focused on climate change adaptation, biodiversity conservation and desertification control. However, a comprehensive overview of the history, status and outlook of forestry development in GCA has been lacking.

Given this, the Asia-Pacific Network for Sustainable Forest Management and Rehabilitation (APFNet) identified the GCA region as one of its seven geographical priority areas for strategic interventions. Desk research and field surveys have been conducted since 2014 with the financial support of the Department of Science and Technology (DST) of the State Forest Administration of China (SFA), the active involvement of officials from different forest authorities, as well as consultants from international organizations, which has culminated in a series of six books being published.

This book, one of the six, gives a holistic overview of the current state of forests and forestry, the contribution of forests to economic development, forestry policies and legislation, and forestry education and research, in Uzbekistan. In particular, sustainable forest management best practices in relation to soil and water conservation, desertification control, forest fire and disease prevention, biodiversity conservation and rehabilitation of degraded forests etc., are covered in-depth.

We hope that this book will be of value to foresters, from policy makers to grass root practitioners and those working in forest authorities, academia, international organizations and civil society organizations who have an interest in forestry development in Uzbekistan.

APFNet Executive Director

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Abbreviations

ADB	Asian Development Bank
CBD	Convention on Biological Diversity
CIS	Commonwealth of the Independent States
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GEF	Global Environment Facility
Goscomzemgeodezcadastre	State Committee for Land Resources, Geodesy, Cartography and State Cadastre of the Republic of Uzbekistan
GNI	Gross National Income
IBRD	International Bank for Reconstruction and Development
ICARDA	International Center for Agricultural Research in the Dry Areas
IFAS	International Fund of Aral Sea Saving
IFF	Intergovernmental Forum on Forests
IMF	International Monetary Fund
IPF	Intergovernmental Panel on Forests
IUCN	International Union for Conservation of Nature
MAWR	Ministry of Agriculture and Water Resources of the Republic of Uzbekistan
MDGs	Millennium Development Goals
MFD	Main Forestry Department
NFI	National Forest Inventory
NGO	Non-Government Organization
OIC	Organization of Islamic Cooperation
OSCE	Organization for Security and Cooperation in Europe
PA	Protected Area
SDGs	Sustainable Development Goals
SCNP	State Committee for Nature Protection of the Republic of Uzbekistan
SCO	Shanghai Cooperation Organisation
SFM	Sustainable Forest Management

Abbreviations

UAS	Uzbek Academy of Science
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNFCC	United Nations Framework Convention on Climate Change
UNFF	United Nations Forum on Forests

Chapter 1 Current state of forests and forestry

1.1 General information of the economy
1.2 Land use status
1.3 Afforestation and reforestation
1.4 Urban forestry
1.5 Community-based forestry
1.6 Production, consumption and trade of forest products

1.1 General information of the economy

The Republic of Uzbekistan is located in the Central Asia between 56°-73° of the East longitude and 37°-45° of the North latitude, and is bordered by Turkmenistan (1,621 km) and Afghanistan (137km) to the south, Kyrgyzstan (1,099 km) and Tajikistan (1,161 km) to the east and Kazakhstan to the north (2,203 km). Uzbekistan is one of the two double land-locked economies along with Lichtenstein in the world, which needs to cross the territories of two other economies to access the world oceans. The major part of Uzbekistan is situated between the two largest rivers in Central Asia: Syrdarya is in the north of the economy's territory but Amudarya is in the south of the economy's territory (Figure 1-1).

Figure 1-1 Map of Uzbekistan

Uzbekistan is characterized by the abundant natural resources, substantial production capacities, mineral and raw-material potential, unique agricultural products, considerable amounts of semi-products produced through the natural resources processing, and well-developed infrastructure.

Uzbekistan is the rule of law and democratic republic with the presidential form of governance. Uzbekistan is a Party of UN and a number of UN specialized institutions. Uzbekistan participates in CIS, SCO, OIC, OSCE, IBRD, and IMF as well as in many other

international organizations. The supreme national body is Oliy Majlis (parliament) of the Republic of Uzbekistan that represents the legislative power. The Oliy Majlis consists of two chambers: Legislative Chamber (lower chamber) and Senate (upper chamber). The Cabinet of Ministers represents the executive power, and ensures guidance of efficient functioning of national economy, social and spiritual spheres, enforcement of laws and other decisions of the Oliy Majlis, decrees and resolutions of the President of the Republic of Uzbekistan.

1.2 Land use status

Deserts and semi-deserts cover about 85% Uzbekistan total area and in the Central Asia alone, and 8,000 to 10,000 square kilometers of desert emerges every year. Desertification, a process in which productive land gradually turns into a desert, is currently one of the serious environmental issues caused by both natural and anthropogenic factors. The most serious ecological problems threatening the economy's natural resources are incremental soil and water salinization, wind and water erosion, overgrazing and deforestation, loss of biodiversity, and reduction in productive potential of arable lands and pastures.

At the same time, economic cost of land degradation problem is relevant and affects all three levels: (i) at the local level, in terms of land productivity reduction; (ii) at the national level, in terms of loss of production capacity of agricultural lands and decrease of the share of agriculture in GDP and export incomes, and (iii) at the global level, in terms of negative impacts on carbon sequestration and climate change, reduction of biodiversity and pollution of the trans-boundary water resources.

Likewise, vegetation degradation is caused by livestock overgrazing, felling of trees for firewood, discharge of drainage water into desert depressions and excessive watering. Once desertification has occurred, it is extremely expensive or impossible to reverse. However, there is always hope for resolving these problems. Sustainable land use can address human activities such as overgrazing, overexploitation of plants, trampling of soils and unsustainable irrigation practices that cause desertification. All the measures that protect soils from erosion, salinization and other forms of soil degradation effectively prevent desertification. Management strategies include measures to promote human activities such as use of traditional water-harvesting techniques, water storage, and diverse soil and water conservation measures. Integrated land and water management is a key method of desertification prevention. Best approaches are as follows: agricultural innovations, modern technologies for growing plants on degraded and marginal lands, effective methods of water use, adoption of conservation agriculture technologies, and integrated pest control.

The land resources are of the great political, social and economic importance in the

development of Uzbekistan. The land and its mineral resources, flora and fauna as well as other natural resources are national wealth, and shall be utilized in an efficient way and are under state protection (according to Article 55 of *the Constitution of the Republic of Uzbekistan*). Moreover, in the Article 53 of *the Constitution*, it is stipulated that legal protection of all forms of properties, including private one is granted in Uzbekistan. Based on those Constitution's provisions, a number of legislation statements stipulated the legal framework for land use had been adopted.

At the national level, land use issues are under responsibility of the State Committee for Land Resources, Geodesy, Cartography and State Cadaster (Goscomzemgeodezcadastre) and Ministry of Agriculture and Water Resources (MAWR). Goscomzemgeodezcadastre is entrusted *inter alia* with the following key tasks:

- Implementation of the unified national policies on efficient use of land, regulations of land tenure relations, land surveying and monitoring, land preservation,improvement and reproduction of soil fertility;
- Development and implementation of government programs aimed at increasing soil fertility, efficient land utilization and protection;
- Implementation of government monitoring and control to ensure efficient utilization and protection.

MAWR's key tasks are as follows:

- Participation in development of investment policies for the rural, water and forestry sectors;
- Ensuring the strict compliance with national legislation on utilization of land and water resources;
- Implementation of national policies aimed at forestry utilization, protection, conservation, and development.

At the regional level, the heads (Khokims) of the provincial and district administrations (Khokimyats) are responsible for issues related to utilization of land, water and other natural resources, and implement overseeing and control over the compliance with the environment protection legislation.

The Goscomzemgeodezcadastre and State Committee for Nature Protection (SCNP) undertake the governmental monitoring and control over the land utilization and protection; however, their functions differ. SCNP implements control over the extent of land polluting by industrial and other wastes, chemicals and radioactive substances, waste waters as well as monitoring of utilization and protection of lands of nature conservation, recreation and health improving values. Goscomzemgeodezcadastre fulfills overseeing and monitoring of land utilization and conservation related issues that are not within the

competencies and powers of SCNP[①].

The key legal and regulation framework that regulates land policy and land tenure in Uzbekistan is *Land Code* (1998, with amendments and changes). The *Land Code*(1998) stipulates the key principles of land use that are listed below:

- Establishing a fund aimed at improving soil quality and fertility as the highly valued natural resource;
- Ensuring efficient, effective and targeted use of lands;
- Providing government and other support to implementation of activities aimed at increasing fertility of agricultural lands and improving land reclamation status and land conservation and protection;
- Avoiding damages to lands in particular and environment in general, and ensuring environmental safety requirements;
- Promoting variety of land plot property rights and land plot use, and ensuring equality of all stakeholders/users involved in land tenure relations, protection of their legal rights and interests;
- Chargeable land use;
- Ensuring completeness and accessibility of land-related information.

According to the *Land Code*, all the lands available in Uzbekistan are classified based on eight categories, with each category of land having a specific targeted purpose conditioned to the type of their use (Table 1-1).

Table 1-1 Land categories of Uzbekistan as of January 1, 2013

#	Categories of land resources	Total area		Including irrigated lands	
		thousand ha	%	thousand ha	%
1	Agricultural land	20,481.1	46.12	4,211.4	9.48
2	Settlement land	214.1	0.48	49.9	0.11
3	Lands used for industry, transport, communication, defense and other purposes	914.5	2.06	12.0	0.03
4	Lands used for nature protection, health improvement and recreational purposes	75.9	0.17	0.9	0.002
5	Lands used for historical and cultural purposes	6.2	0.01	0.0	0.0
6	Forestry fund lands	9,636.9	21.70	31.4	0.07
7	Water fund lands	831.4	1.87	4.6	0.01

① Country Profile on Housing and Land Use in Uzbekistan, UNECE, 2015.

(Continued)

#	Categories of land resources	Total area		Including irrigated lands	
		thousand ha	%	thousand ha	%
8	Land reserved	12,250.2	27.59	2.0	0.004
	TOTAL	**44,410.3**	**100**	**4,312.2**	**9.71**

Source: Country Profile on Housing and Land Use in Uzbekistan, UNECE, 2015.

Based on the Table 1-1, the three largest land categories are agricultural lands (46.12%), state fund forestlands (21.7%), and reserved lands (27.59%). In total, these land categories cover over 42 million ha (95% of the territory of Uzbekistan).

Uzbekistan represents a developed agrarian and industrial economy, in which agriculture exclusively depends on availability of water resources. The locations for crops growing and major part of livestock breeding (except astrakhan sheep pasturing in desert) are particularly limited by irrigated lands. Due to arid climate, only up to 752,900 ha (18%) of arable lands are non-irrigated ones.

The detailed information about agricultural lands, state fund forestlands and reserved lands (as of 01.01.2012) is given in the Table 1-2.

Table 1-2 Agricultural lands, state fund forestlands and reserved lands as of January 1, 2012

Category	Land type	Area / ha	Percent of the category	Percent of total area of agricultural lands, state fund forestlands and reserved lands
Agricultural use of lands	Arable lands (82% of irrigated lands, and 18% of non-irrigated lands)	4,045,600	19.7	9.5
	Perennial plantings (fruit, vineyards, mulberries, etc.)	343,000	1.6	0.8
	Household plots	616,200	3	1.5
	Hayfields	104,900	0.5	0.2
	Pastures	11,018,800	53.8	26.0
	Forest plantings (forest belts, poplar plantations)	210,200	1.03	0.5
	Shrubs	31,100	0.15	0.1
	Lands under reclamation and amelioration stage	70,700	0.35	0.2
	Fallow lands	78,400	0.38	0.2

(Continued)

Category	Land type	Area / ha	Percent of the category	Percent of total area of agricultural lands, state fund forestlands and reserved lands
Agricultural use of lands	Unused lands	3,954,600	19.3	9.3
	Total (46.1% of the total economy's lands)	20,473,500	100	48.3
Lands of the state forestland fund	Forest plantings	2,945,500	30.57	7.0
	Pastures	3,109,100	32.27	7.3
	Unused lands	3,471,900	36.03	8.2
	Other	109,400	1.14	0.3
	Total (21.7% of the total economy's lands)	9,635,900	100	22.7
Reserved lands	Pastures	6,319,600		13.1
	Forest plantings	43,600		0.1
	Unused lands	5,896,200		15.8
	Total (27.6% of the total economy's lands)	12,262,700	100	28.9
Total agricultural lands, state fund forestlands and reserved lands (95% of the total economy's lands)		42,372,100		100

Source: The State Committee of the Republic of Uzbekistan on Land Resources, Geodesy and State Cadaster.

Payments for utilization of public lands are done by their users through land tax and lease payments. In Uzbekistan, there are three key categories of land users, i.e. agriculture products producers:

- Shirkat is an agricultural production cooperative that is built on the collective basis (currently, in crop sector, the majority of shirkats have been transformed into farms but in livestock sector, in particular in astrakhan sheep breeding, they are still substantively represented);
- Farming is an economic entity having legal entity rights (mainly in the form of private enterprise with the right of associating with using various forms of cooperation). For the farms specialized on crop production, the minimal size of land plots, provided for lease to grow cotton and/or wheat, is at least 10 ha, but for horticulture, viticulture, vegetable growing, etc., the plot size is at least 1 ha. In Uzbekistan, there were about 23,000 farms in 1998, but 66,134 farms in 2013;
- Dekhan farm (household) is a small family-based farm having both legal entity status and non-legal entity status that implements small-scale agricultural activities and agricultural

production sales based on individual inputs of the family members using the allocated land plots. Dekhan farm is not allowed to hire additional external labor force on the permanent basis; however, seasonal workers can be employed to perform particular work on the temporary term agreement basis. Dekhan farms are provided with land plots of the limited size (up to 0.35 ha at irrigated lands, up to 0.5 ha at non-irrigated lands but up to 1 ha at non-irrigated pastures located in desert areas). Those plots are given for the legitime life tenure, without any strict obligations, except observation of the requirement on conservation of land qualities, sanitary and environment standards, existing norms and standards applied to quality of the products. Utilization of the provided land plot is paid through land tax. Lands of dekhan farm cannot be privatized and a subject of purchase and sale, securities, grant or gift, and exchange. It should be mentioned that dekhan farms use only up to 12% of agricultural lands but produce over 65% of the total amount of agricultural production and over 92% of livestock production. The key legislation regulating activities of dekhan farming is the Law *"On Dekhan Farming"* (1998), and according to the *Civil Code of the Republic of Uzbekistan* (1995, with changes and amendments), dekhan farms are provided with lands for legitime life tenure.

The types of land tenure is stipulated in the *Civil Code* (1995, with changes and amendments), which envisages that land resources shall be owned through one or another type of tenure. In terms of the Code, both private and public ownerships are allowed, and property rights for land tenure are "provided in the cases that are in conformity with the legal regulations and procedures". Other types of land utilization envisaged in the Code include: (i) right of undertaking economic activities; (ii) legitime life tenure; (iii) right of permanent tenure and use of land plot; and (iv) right of servitude.

The high sensitivity of desert and mountain ecosystems to climate change impacts, in combination with natural and anthropogenic factors induced desertification processes, determines Uzbekistan, along with other economies in the world, as an economy with the most serious land degradation situation. In this regard, discussion of land use issues related to Uzbekistan would be incomplete without mentioning the importance of water resources for irrigation needs as 80% of the economy's territory are deserts and/or semi-deserts but only 4.2 million ha (20.5 million ha that are considered as agricultural lands) are irrigated lands. In this regard, availability of access to water resources strongly affects the land policy and land use pattern. Thus, according to *the Resolution of the Cabinet of Ministers "On improving state registration of rights of immovable"*, since 2015, the stock-taking of land plots has been done through land-cadaster book-keeping that contains overall information about land users, land composition, quality and normative costs of agricultural lands. At the same time, a particular importance is given to irrigated and non-irrigated status of land plots.

- Regulations on land monitoring in the Republic of Uzbekistan. Annex to the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan, #496 of 23.12.2000;
- Constitution of the Republic of Uzbekistan;

- Law *"On Lease" of the Republic of Uzbekistan* (1997);
- Land *Code of the Republic of Uzbekistan* (1998);
- Law *"On agricultural cooperative* (*shirkat*)*" of the Republic of Uzbekistan* (1998);
- Law *"On Farming" of the Republic of Uzbekistan* (1998);
- Law *"On dekhan farming" of the Republic of Uzbekistan* (1998);
- Law *"On the state land cadaster" of the Republic of Uzbekistan* (1998).

The *Land Code* is in line with a number of laws, decrees of the President of Uzbekistan and other legal and regulation documentations related to land, land tenure and land use, including:

- "*On the decision-making process of issues related to administrative and territorial systems in the Republic of Uzbekistan*";
- "*On the state cadasters*";
- "*On the state land cadaster*".

The land use issues are also regulated by a number of resolutions of the Cabinet of Ministers of Uzbekistan, including:

- "On the state land cadaster in Uzbekistan", #543 of 31.12.1998;
- "On adoption of the regulations on land monitoring in the Republic of Uzbekistan", #496 of 23.12.2000;
- "On measures on implementation of farming development concept for 2004-2006", #476 of 30.10.2006;
- "On additional measures on improving provision of land plots on tender-basis competition to legal entities and individuals to undertake entrepreneurship activities", #147, 25.05.2011;
- "On improving the procedure for the state registration of rights of immovable properties", #1 of 07.01.2014

1.3 Afforestation and reforestation

According to the orographic, soil and climate conditions, forests (forest-covered lands) in Uzbekistan are categorized as mountain, valley, floodplain (tugai) and desert ones. Uzbekistan is situated in arid zone and is considered as a forest-poor economy. In Uzbekistan, the percentage of forestland, i.e. ratio of the forest-covered area to total territory of the economy, is about 7%. Forests in Uzbekistan perform important protective functions though their area is quite small but production capacity is very limited.

Forests in Uzbekistan constitute the fundamental natural component. As an integral part of biodiversity, forests perform important environment and social functions and play significant role in development of national economy and improving environment. With absence of negative anthropogenic impacts, forests represent the sustainable ecosystems that are in the best way adapted to the local soil and climate conditions and natural climatic impacts.

However, the geographical location of Uzbekistan determines development of desertification, land degradation and deforestation processes, which scale and intensity are induced by the natural and climatic factors. At the same time, the key indirect and/or direct factors of these processes impacted forest and landscape degradation are human activities and actions. In their turn, deforestation and forest degradation combined with global warming process, as a rule, are followed by land degradation with further desertification.

Due to intensive, extremely inefficient and highly voluntaristic agricultural policy implemented in Uzbekistan during 50-60s of the previous century, dramatic decrease of forestlands occurred. Thus, due to overregulated runoffs and construction of hydro engineering facilities, tugai (riparian) forestlands were abruptly (in over ten times) decreased. Overgrazing, wood and shrub logging for firewood and construction needs, water drainage into the bottomlands, and excessive watering had resulted in forest degradation in mountain and desert areas. The forests and environment in both Uzbekistan and overall Central Asian region were the most catastrophically affected by drying of the Aral Sea due to excessive and wasteful draw-off from the two main revers feeding the Aral Sea, namely Amudarya and Syrdarya.

Impacts induced by deforestation and forest degradation, climate change and loss of biodiversity can cause deterioration of social and economic situation. In this regard, actions aimed at mitigating the negative impacts of those impacts such as reverting deforestation trends, preventing forest degradation and promoting afforestation and forestation are implemented in Uzbekistan. It should be mentioned that currently in Uzbekistan civil society starts to more focus on environment problems related to forests, and in particular on biodiversity conservation and forest gene pool as well as increasing forest sustainability. Measures and actions implemented at the national level and focused on reforestation and forestation work have resulted in increasing forestlands and forest productive functions, improving forest guarding and protection.

Considering importance of forests for strengthening forestry capacity, forming funds for further forestry development, improving material and technical basis of forest farms, and forest conservation, protection, reproduction and rehabilitation, the Cabinet of Ministers has issued a particular Resolution #198 of 10.06.2016.

In Uzbekistan, forest policy and implementation of forest-related activities are under responsibilities of the Main Forestry Department (MFD) under MAWR. Moreover, MFD is responsible for the existing forests' conservation and improvements, and for increase of forest-covered lands through forest rehabilitation, forestation, establishing forest and pasture protective belts and forest plantations.

The protective forestation is of the great importance that enables efficient utilization and inclusion of underproductive and degraded lands into agricultural activities, improving open landscapes, their flora and fauna, and increasing productivity of livestock. Moreover, the

artificial forest protective plantings produce wood, fruits and nuts, and perform aesthetic functions. Protective forestation shall be implemented with applying intensive technologies that would significantly increase their economic and environment values, and reduce production period of special-purpose forest species.

Improving the existing forest shape and enlarging their areas through forestation activities are implemented at the lands of the State Forest Fund (SFF) located in desert, mountain, and tugai (riparian) zones. Saxaul, saltwort and kandym (Calligonum) are mainly planted in deserts, three kinds of juniper, walnut, almond and pistachio are planted in mountain areas, poplar, maple, plane, elm, gleditsia, fast-growing and fruit trees as well as alien species are grown in valley areas, and poplar, willow, and Russian olive are grown in tugai (floodplain) zone.

The activities implemented by MFD during last years in the Aral Sea region resulted in coverage by forest plantations of over 740,000 ha, among which up to 600,000 ha were planted at the exposed bed of the Aral Sea. Thank to this, over 230,000 ha of desert lands had been transferred into the category of land-covered lands. Annually, forest plantings at the exposed bed of the Aral Sea are implemented at the area of 18,000 ha but total amount of forest plantings done by MFD over Uzbekistan reaches 42,000 ha. Correspondingly, 1% of the territory of Uzbekistan is covered by forests, namely by coppice. During 2000-2013, total area covered by forest was increased in two times: from 1.37 million ha in 2000 (or 3% of total territory of Uzbekistan) to 3.33 million ha in 2013 (or 7% of total territory of Uzbekistan). From the total amount of sowing, including forest plantings, over 80% were done in desert areas (in the Aral Sea region and at the exposed bed of the Aral Sea) to combat desertification. Forming protective forest belts in desert zones halts moving sands and stabilizes environment situation; thus 1 ha of saxaul plantations prevent transfer of 30 tons of sand per year, and provide favorable conditions for flora and fauna. Growing planting stock for artificial reforestation and forestation, greening and improvements/upgrading activities are implemented in 83 forest nurseries occupied over 700 ha.

To cover the Uzbekistan's population needs in timber, the Cabinet of Ministers had issued a particular Resolution #62 of 08.02.1994. To enforce the resolution, MFD's subdivisions implemented establishing fast-growing species (such as poplars) plantations that are capable to produce up to 500 m^3 per ha at pilot plots covered by twenty-year trees.

Apart from MFD, rehabilitation of degraded forests and forestation are implemented by various government institutions responsible for forests lands. It is obvious that the Programme on growing intensive gardens contributes to forestation activities in Uzbekistan. In this regard, new gardens covered about 50,000 ha had been planted during 2010-2014, and they included over 14,000 ha of intensive gardens. It shall be emphasized that within intensive horticulture approach the trees fruit at the second and third years.

Such activity within forestry sector provides inputs into process of national economy greening through:

- Economic dimension of forestry from which forests and local population are benefited from is supplying local markets with agroforestry products and expansion of export opportunities;
- Social dimension of forestry includes new job opportunities, decreasing migration of local people/communities, options for lease of forestlands, and forest availability and use by generations to come;
- Nature protection and environment conservation dimension of forestry is Sustainable Forest Management (SFM), conservation and expansion of forestlands, strengthening the combating of desertification.

1.4 Urban forestry

The improvements through establishing of parks and greening of urban areas in the modern cities are those elements that make such settlements particularly attractive, environment-friendly and comfortable. The greening activities include initiatives aimed at environment improvements and upgrading urban territories.

In this regards, given the hot and arid climate in Uzbekistan, greening of urban areas with consideration of environmental, sanitary and hygienic functions performed by plants is of the great importance. System of greened urban territories allocated for common use in the city includes parks, gardens, squares, boulevards, and plants at the streets and around the administrative and public buildings.

The city level greening activities are implemented by departments on improvements and upgrading that are subordinated subdivisions of the corresponding administrations (municipalities). Apart of other relevant work, they are engaged in urban greening through growing and/or procurement of samplings and flower seedlings, trees and flowers planting as well as their maintenance and care. The key task of greening is planting various species of trees (large-sized), establishing hedges from various shrubs, trees and adornment plants, and establishing lawns. To implement their activities, the department on improvements and upgrading should take into consideration the geographic, climatic and landscape features of the area.

Since Uzbekistan's independence, many activities aimed at improving the architectural style of the modern image of cities have been implemented in the economy with taking into account the national traditions and best international practices on urban planning. At the same time, urban greening plays a critical role in formation of the architectural and art-valued image of the city.

Considering the needs for production of valuable adornment plant species, environment and sanitary improvements, and increase of greening work scale stipulated in the *Resolution of the Cabinet of Ministers, #76 of 02.03.2005*, the Republican Scientific and Production Center

on Ornamental Gardening and Forestry had been established under the MFD.

At the present time, over 200 tree species are grow in the cities of Uzbekistan, and are represented by both local flora such as polar, oak, elm, chestnut, juniper, plane, ash-tree, maple, sophora, etc. and imported flora from other countries (Norway maple, tulip-tree, evergreen magnolia, paper-tree, ginkgo, pine-tree, lime-tree, box-tree, cypress, etc.). It should be mentioned that the large-scale urban greening activities in Uzbekistan had been started back to 50 years through planting some local species. Plane, ash-tree, poplar and willow were the key species planted. In the course of time, prevalence of deciduous trees over conifers in the initial greening plantations was noted. It was also identified that the deciduous species are the most effective for improving environment in large cities. Among them the most indicative and acceptable are such trees as large-leaved lime, weeping willow, chestnut oak, tulip-tree, Magnolia soulangeana, ash-tree, chestnut, soapbark-tree, maple, scholar tree and Chitalpa tashkentensis; and such shrubs as Sharon rose, Japanese quince, Pyracantha, Forsythia, andsuch coniferous as thuja compact, Crimean and black pine-tree, cedar red juniper, meta-seqouia, cypress, etc. Such approach makes the urban landscape more sustainable and improves microclimate and sanitary status of the urban habitat. The particular focus is given to Tashkent city as the capital of Uzbekistan. In 2012, the area of green plantings in Tashkent was 15,200 ha or about 35% of the total territory of the city. Botanic Garden of 66 ha is situated in the capital's territory. In Tashkent, there are 18 parks occupied 158.4 ha but almost 69 m^2 of area planted by trees, shrubs and flowers is available per one city inhabitant. At the same time, though the quite wide assortment of tree and shrub species is currently available and used for greening the city, there are still obviously prevailing species. Currently, among the total amount of ornamental trees available in Tashkent, plane amounts to 15%-20% and poplar reaches 10%-12%.

In 2014, 142 million of saplings and 74 million of cuttings, included such valued species as Crimean pine-tree, Japanese sophora, tulip-tree, chestnut, cedar red juniper, blue fir, sequoia, evergreen box-tree, in total 60 kinds of ornamental species were particularly produced in nurseries belonging to MFD to cover the needs in urban greening activities.

Currently, work on growing trees and shrubs required for furthering development of green urban areas with consideration of landscape planning during development of master plans for development of cities, towns and settlements is continued.

The legal and regulation documentations listed below support the development of urban greening activities:

- Resolution of the Cabinet of Ministers "On set-up and approval of taxes for calculation of payments for damage caused to flora of the Republic of Uzbekistan", #293 of 27.07.1995;
- Resolution of the Cabinet of Ministers "Regulations on arrangement of work aimed at improvements and upgrading settlements with consideration of modern architectural and urban planning requirements and standards", #59 of 09.03.2009.

In the recently produced *Country Profile on Housing and Land Use in Uzbekistan* (2015) developed by UNECE in cooperation with the Government of Uzbekistan, it is mentioned that the capital of UzbekistanTashkent is a very green city, in which total area of green zones is 35,500 ha. In Uzbekistan, greening activities have long historical traditions, and are some kind of response to the economy's continental climate characterized by extremely hot and dry summer seasons. In the Profile, it is concluded "Cities should view tree planting as an environmental service, providing shade during the hot season and protecting buildings during the cold season."Peripheral greenbelts will be vital for maintaining urban resilience to climate change. Green urban infrastructure planning also may be integrated in territorial development planning to prevent risks related to heat and floods".

1.5 Community-based forestry

Currently, in many economies in the world, community-based forestry becomes the cost efficient and socially effective for ensuring sustainable management of natural resources. The principles and approaches applied to community-based forestry are aimed at establishing a fair partnership between the local people living in and/or nearby forestlands with government agencies to rehabilitate, conserve, protect, and manage forest resources.

It is obvious that lack of the corresponding rights and interests of local population being the active users of forest products, which resulted in their considering forests as an "open access" resource, is the key root cause of severe forest ecosystem degradation. Introducing transparent management tools and adjusted approaches on forest utilization with involvement and participation of local forest users could halt increasing degradation, and at the same time improve their welfare. Thus, the goal of community-based forestry is to reduce degradation of natural resources and to achieve environment and economic benefits. In this regard, one of the strategic directions of the national forestry policy is involving local population and communities into joint forest management.

As the best practice shows, capacity of local population and communities as the full-ground stakeholders in forestry sector, and their involvement and participation in forest management are the best way and efficiently utilized in the economies having rich forest resources, powerful environment NGOs, and active civil society, which understands and appreciates the aesthetic and recreation value of environment. To combine economic activities and environment protection in efficient way, with considering its aesthetic and ethical value-added, reliable interrelations between the interested local communities and relevant government agencies responsible for forestry should be definitely established.

In Uzbekistan, the significant part of rural population is living in and/or nearby forestlands. Their welfare and social benefits are directly dependent from forest products, which are considered as one of sources for increasing livelihood and social benefits available in rural regions. In this regard, forestry subdivisions develop the planning activities regulating impacts

on forests and aimed at achieving the SFM with participation of local self-government, population and local communities. At the same time, tools of joint forest management could be lease of forest plot and community-based forestry but mechanism to implement this approach is an integrated management plan, i.e. development of new (non-traditional) action plans aimed at sustainable and multifunctional forest management. This approach considers forest as a unified ecosystem that is in permanent interaction with the environment and human society. Therefore, new management plans shall be 'integrated' and simultaneously consider the potential of resources, needs and demands of all stakeholders.

It shall be pointed out that in this case the relevant international experience and knowledge that can be adjusted to local environment, peculiarities and realities are very useful.

In Uzbekistan, a number of international organizations have implemented projects within which activities on biodiversity conservation and promotion of community-based forestry were undertaken. For instance, one of UNDP/GEF projects has had a particular component focused on "community-based forestry and afforestation", within which the corresponding methodological guidelines were developed, local population was trained, pilot sites were selected, legal and regulatory documentation on the long-term forestland lease was developed and adopted, and reafforestation activities were implemented at the pilot sites.

Another UNDP/GEF project had implemented training on "best practices on sustainable land management: community-based forestry and agroforestry". The goals, objectives, approaches, benefits and problems of the agroforestry and community-based forestry were introduced to the training participants. They also learned the case studies and best practices, conducted situation analysis, developed optimal options on how to achieve the set targets, and planned the relevant agroforestry and community-based activities with consideration of potential income-generations and benefits.

The workable approaches on rehabilitation of degraded forestlands reduced the corresponding government funding, but those lands' leaseholders benefited from sustainable income-generations. The leaseholders represented by local people in cooperation with district-level forest farms implemented reafforestaion work at the degraded plots belonging to local forest farms at mutual beneficial terms. Based on the lease agreement concluded with the corresponding forest farm, the degraded forestland plots were handed over to leaseholders for five-year period. As soon as all terms of the lease agreement were observed, the lease period would be prolonged up to 10 years. The leaseholders implement tree plantings and take care of them, but the yield from growing vegetables and fodder crops in the row spacing is left with them as an award, and the wood products are shared fifty-fifty between the leaseholders and forest farms. To observe the lease agreement terms by both parties, the Councils of community-based forestry have been established and their Statutes have been adopted. Such Councils included representatives from local community, district administration, local self-government, and nature protection agencies. During the

Councils'meetings, current issues and problems were discussed, and community-based forestry decisions were made. The benefits of community-based forestry, such as fast profit making through use of row spacing, stable income-generation by families of the leaseholders participated in the community-based reafforestation activities, increased individual and public responsibilities of local people for shape of the adjacent forests, establishment of favorable environment for self-employment of local people, and saving of public funds that were previously spent for afforestation and protection of rehabilitated forest were demonstrated.

Within the framework of ICARDA project focused on development of local strategies on climate change adaptation implemented in 2011-2013, inhabitants of mountain village Kadok (in Navoi province) implemented activities on rehabilitation of forest plantings at adjacent degraded forestlands. Degradation was occurred due to excessive pressure to trees, shrubs, and vegetation cover, in particular by collection of firewood and overgrazing.

Prior to starting the activities on rehabilitation of forest plantings, terracing had been done at the degraded slopes. Based on testing results, fodder shrubs such as Kochia prostrata, Ceratoides ewersmanniana and Halothamnus subaphylla have been selected. The strong rootage of those shrubs could help prevent soil erosion and reduce risk of landslides. To rehabilitate the degraded forestlands, the economical valuable trees such as local species of almond (*Amygdalus bucharica*, A. *spinosissima*), hawthorn (*Crataegus turkestanica*) but dog rose (*Rosa canina*) of the shrubs had been selected as the key plantings.

Thanks to the joint work and common activities undertaken for planting trees and fodder shrubs at mountain slopes, new sources of income generation have become available for local people, and level of vulnerability to risk of landslides was reduced. At the meeting of rural inhabitants, two important decisions were made: banning on unregulated livestock pasture at the rehabilitated slopes, and establishing a working group composed of local people to manage processes of forest planting rehabilitation and sustainable use of the rehabilitated plots.

The benefits of such approach to land use and equality of rights of each household during making decision and sorting out the appeared issues are the key prerequisites that determine the common consensus and agreement of all households for banning on unregulated pasture at the rehabilitated foothills and establishing a new system of collective management.

According to the regulations, each household stands ready to stop unregulated pasture of their cattle at the rehabilitated slopes, and is ready to participate in collective work on yield harvesting. The harvested yield (fodder, firewood, and furtherherbs) would be equally shared between all involved households. Apart from providing the fodder for cattle and income generated from sale of fruits of trees and shrubs, the rehabilitated forests would contribute to improving the natural beauty of landscapes, and enable one-day recreation activities and tourism as additional source of income generation. Those incomes should cover further

costs of rehabilitation of forest plantings. The established working group should oversee and control cattle pasture to ensure sustainable livestock. Moreover, this body will arrange community-based activities focused on rehabilitation of forest plantings, harvesting and fair distribution of the yield and incomes generated between the households involved.

Within the framework of Flermoneca project "*Forest and biodiversity management, including environment monitoring*", the regional meeting on joint forest management in Kyrgyzstan, Tajikistan, and Uzbekistan has been conducted in August 2016. The key thematic focuses of the Uzbekistan's presentation were forestry development in Uzbekistan, forestry education, experience and approaches applied to forestation and environment protection in Karakalpakstan, role and capacity of forestation at non-irrigated lands, involvement of local population and farming into community-based forestry as well as importance and role of environment NGOs in enabling development of community-based forestry.

It shall be emphasized that in Uzbekistan forest plot lease can be provided for the implementation of the following forest-related needs:

- Collection of firewood and auxiliary wood products;
- Haymaking, agricultural crops growing, placing apiaries, collection of wild fruits and nuts, mushrooms, berries, herbs, plants for technical needs and other auxiliary forest products;
- Hunting activities and needs, scientific and research, cultural and health improvement, tourist and sports activities.

It is obvious that transfer of rights of forest management to local communities and small farms provides opportunities for increasing access to benefits generated by forests that in its turn ensures better understanding and appreciation of forest value-added. Efficient community-based forest management requires that government bodies and communities realize the functions that they are entrusted with, and each party has the required capacity to perform them.

The insufficient level of coordination and cooperation between various ministries and agencies, shortage of forest professionals who possess the modern knowledge and skills, inadequate stocktaking and monitoring prevent the wider introduction of the principles and approaches on the community-based forestry. At the same time, it is obvious that sustainable management of forest plots through the community-based forestry allows restoring the key functions and services of forest ecosystems that enables adaptation and mitigation of climate change, biodiversity conservation and combating of desertification. Thus, approaches and principles of community-based forestry can contribute to implementation of the three Rio Conventions: *United Nations Framework Convention on Climate Change (UNFCCC)*, *Convention on Biological Diversity (CBD)*, and *United Nations Convention on Combat Desertification (UNCCD)*. Therefore, in the draft concept on forestry development up to 2030 in Uzbekistan, a particular focus is given on the community-based forestry.

1.6 Production, consumption and trade of forest products

Uzbekistan is considered as a low forest-covered economy. The state forest stock occupies 9.6 million ha (21.7%) of total territory of the economy. Forest-covered lands amount to 3.03 million ha but forest cover is 6.7%. The major lands of state forest stock are situated in Karakalpakstan, Bukhara and Navoi provinces but smaller ones are available in Fergana Valley, Samarqand and Syrdaria provinces. State forest stock is characterized by sandy (7.78 million ha), mountainous (1.5 million ha), floodplain (tugai) (0.10 million ha) and valley (0.18 million ha) lands.

The Uzbek forests are belonging to the 1st group of forest functions classification. About 200 species of trees and shrubs, including introducents, are available in forests. Key forest species growing in desert lands are saxaul white (Haloxylon persicum) and saxaul black (Haloxylon aphyllum) but other desert shrubs: cherkez, kandim, tamarisk and others (Salsola Paletzkiana, S. Richter, Calligonum sp. и Tamarix sp.). Juniper (Juniperus), thuja (Thuia), walnut (Juglans regia L), pistachio (Pistacia vera L), almond (Amugdalus sp), hawthorn (Crataégus), others (Berberis sp., Rosa sp. and Hippophae rhamnoides) cover the mountain areas. Thickets of endemic poplars and other broadleaved trees (Populus pruinosa, P.Diversifolia, Elaeagnus sp.и Salix sp.) are prevailing species in floodplain forests. There are deciduous, fruit and other tree species in valleys.

In Uzbekistan, forests are the state property and constitute the united forest stock, and including the forests of national importance, and the forests belonging to government forestry bodies but utilized by other sectoral agencies and legal entities.

In general, utilization of natural resources may be general use or special use. General use of flora is undertaken in agreement with landowners and land users, free of charge and in the amounts limited to livelihood needs. Special use of flora is allowed through a permit system.

Forest utilization can be permanent or temporary. Permanent forest users are forestry enterprises, institutions and organizations, to which the forest reserve is belonging to, and those having rights for permanent ownership. In many cases, temporary forest users are local communities. Forest management can be implemented at the short-term basis, up to 3 years, or long-term one, up to 10 years. Norms and procedures applied to public authorities are determined by the government agencies responsible for their lands and in agreement with SCNP. The fees, their rates and collection procedures are determined by the Cabinet of Ministers.

To increase forest cover, MFD implements activities aimed at biological diversity conservation. The key indicators characterizing MFD's activities conducted during 2010-2011 are summarized in Table 1-3 below.

Annually, forest farms in Uzbekistan undertake forest seeding (at 43,000 ha), planting (at 20,000 ha), and enable natural reforestation (at 16,000 ha), including 16,000-17,000 ha of the exposed bed of the Aral Sea.

Table 1-3 Key activities of Main Forestry Department in Uzbekistan

Indicators	Unit	2010	2011
Reforestation and protective forestation (seeding, planting, supporting natural reforestation)	thousand ha	42.5	42.8
Including at exposed bed of the Aral Sea	thousand ha	15.3	16.7
Growing planting material (seedlings, saplings)	millionpieces	50.1	50.2
Production of forest seeds	ton	139	143
Production of forest herbs and food plants	ton	314.6	280.5
Terrestrial exterminatory measures to combatdesertification	thousand ha	24.4	24.8
Sanitary felling	m^3	5,450	3,662
Reforestation and forest felling	m^3	20,315	16,850

Source: Fifth National Report of the Republic of Uzbekistan on Conservation of Biodiversity.

In 2014, the planted fruit and decorative trees included: 2,200 seedlings of tulip trees, 910 pieces of Crimean pine, and 47,200 pieces of unabi. Forest protection activities were implemented at the area of 25,225 ha, and included biological measures to combat against the forest diseases and pests that covered 15,225 ha; 123 km of fire protective forest belts; 58 km of forest shelterbelts; and 314 mineralized bands were constructed. 100 ha of lands were planted with 18 kinds of herbs and food plants, and 263 tons of herbs and food plants were harvested. Over 85,000 packs with 10 kinds of herbs and food plants were produced.

While in 2015, over 4,700 seedlings of tulip trees, up to 36,000 pieces of Crimean pine and over 39,000 pieces of unabi have been planted. Simultaneously with forest plantings, forest protection activities were implemented at the area of 24,500 ha, and included the biological measures that covered 15,100 ha. Plantations of herbs and food plants were established at 1,822.8 ha of forest lands.

The share of suspended timber production is up to 30% (or 10 m^3) of the total amount of timber produced annually. This kind of timber is used as construction material and for manufacturing over 60 kinds of articles and goods for industries and household needs such as wicker furniture, baskets and pads, and other wicker ware, window and doorframes, shovel hafts, traditional wooden sofas (suri) and tables (khan-takhta) as well as various handicraft items, souvenirs, etc.

Besides the main purpose of forest products, local people use them as follows: pear-tree and apricot-tree for manufacturing musical instruments; walnut tree for manufacturing furniture and turnery items (wood burls); leaves and pericarp for medical needs; pistachio tree for charring, and manufacturing turnery items and for paints production; desert species (saxaul, cherkez, kandim, etc.) for firewood; and buckthorn and barberries as raw material for paints production and for medical needs.

To provide population of the economy with industrial timber, the forestry bodies have initiated development and adoption of a special government resolution "*On measures aimed at further growing industrial poplar wood, and establishing plantations of the fast-growing species*", #62 of 08.02.1994. It shall be emphasized that 1 ha of plantation with poplar and other fast-growing forest species can produce 100-600 m^3 of timber. As it demonstrated at sites where growing various kinds of poplars was piloted, gross output of timber from the twenty-year poplars was 600 m^3, by which 411 m^3 of wood goods, 42 m^3 of construction logs and 12 m^3 of thin round timber were produced. Currently, technologies on timber production from local hybrid poplars which can be grown in plantations located at irrigated lands have been developed and are available.

Given the fact that annual volume of timber domestically produced by all kinds of felling amounts to no more than 40,000 m^3 (Table 1-4).

Table 1-4 Timber production in 2013

Species of wood	Yield
Round wood (1,000 m^3)	36
Industrial round wood (1,000 m^3)	10
Lumber (1,000 m^3)	25
Wood-based panels (1,000 m^3)	4
Wood pulp (ton)	7
Firewood (1,000 m^3)	26

Source: FAO Statistics, http://www.fao. org/forestry/country/57025/en/uzb/.

At the same time, non-timber forest products and services provide important contributions to livelihood of rural population as local communities widely use them. Those include, for instance, haymaking, beekeeping, harvesting nuts, fruits, berries, mushrooms, foods and medical herbs, and firewood.

Overall, herbs and wild food plants are highly demanded in Uzbekistan. In the economy, there are a number of various companies specialized in production of wild food plants and herbs, and they serve the pharmaceutical and food industries' needs. The key supplier of those non-timber forest products is the Production Enterprise "Shifobakhsh" within MFD. Quotas (norms) for industrial production of herbs and wild food plants as well as for other vegetative technical raw material are determined and set up annually by SCNP with consideration of justifications provided by the Academy of Science of Uzbekistan. Data on amounts of vegetative forest products produced in 2010 are presented in Table 1-5.

In 2010, about 300 tons of herbs and aromatic plants (*Rosa Canina, Rhus Cariaria, Menta Piperita, Coriander Sativum, Glycyrrhiza Glakra, etc.)* were harvested; 94 tons of nuciferous products (*Almond, Walnut, Pistachio*) and 53 tons of honey were produced; and 12 tons of hay were mowed (Table 1-6).

Table 1-5 Forest products in 2010

Name of product	2010
Quota product, ton	4,355.36
Actual product, ton	1,927.9

Source: Fifth National Report of the Republic of Uzbekistan on Conservation of Biodiversity.

Table 1-6 Commercial value of non-wood forest products in 2010

Name of product	Key species	Commercial value of non-wood forest products 2010 (value 1000 local currency*)	Category of non-wood forest products
Nuts	Pistachio, walnut, nut, almond	740,000	1
Medicinal and Aromatic Plants	*Rosa Canina, Leonurus Turkestanica, Mentha piperita, Calendula officinalis, Crataegus turkestanica*	500,000	3
Honey	Acacia, Safora, Castánea, Tamarisk, cotton, sunflower, Alhagi	1,500,000	2
Fruits Wild	Apple, wild cherry, Crataégus, Hippóphaë	200,000	3
Handicraft from wood	Sálix, Morus, Úlmus, Plátanus	100,000	4
TOTAL		3,040,000	

* Local currency is the Uzbek Soum (UZS). Exchange rate is 1640 UZS=US$1 (as of December 2010).

Source: FAO Global Forest Resources Assessment, 2015, Country Report, Uzbekistan; updated based on the expert's estimates.

In 2015, MFD reported that common consumption goods for population were produced with use of the state forest stock lands, and their sale amounted to US$ 260,000 but forestry-related services rendered to the population were in the range of US$ 28,000[①].

The export of forest herbs generates incomes in the range of up to US$ 80,000 per annum. Overall, annual incomes from sales of timber and non-timber forest products by the forest farms are estimated at approximately US$ 300,000.

The food annuals and perennials are presented by such plants as cilantro, coriander, basil, fennel, onion Anzur, currant, dog-rose, raspberry, etc. It is forecasted that seeding and planting the forest food species will be implemented at the areas of up to 800-1,000 ha by 2020. In this case, the total output of wild food plant production can reach 1,000-1,500 tons per annum that would meet the corresponding needs of population in Uzbekistan.

① Ministry of Agriculture and Water Resources of the Republic of Uzbekistan, 2015

Chaptre 2 Contribution of forests to economic development

2.1 Economic and environmental significance of forests and woodlands

2.2 Financing and investment in forests and forestry

2.3 Forests, livelihoods and poverty

2.1 Economic and environmental significance of forests and woodlands

2.1.1 Environmental significance of forestsand woodlands

The environment functions of Uzbek forests are recognized by the government, and their importance is constantly increased. Based on their nature and group category, the key of Uzbek forests are performing the protecting, water saving, sanitary and hygienic, oxygen generating, climate regulating and health improving functions. This group includes also forests in the strictly protected areas. In Uzbekistan, forests play an important role in combating desertification. They protect agricultural and other lands from water and wind erosions, and other natural disasters. Moreover, forests prevent the formation of mudflows not only by transforming surface run off into subsurface one but also by fixing the moving sands. They significantly impact the other sectors of national economy, in particular agriculture, livestock and conservation of water resources. The aggravating water shortage and stress contribute to increasing importance of role of mountain forests in water conservation, i.e. in watershed management to form river runoff. In all natural zones of the economy, soil protective function performed by forests becomes more and more important. Afforestation of state forest stock lands, and in particular of irrigated agricultural lands, provides substantial carbon sequestration potential, which is not tapped so far. This potential comprises not only an ecological aspect related to climate change mitigation activities but also an economic value, which can be transformed into cash incomes. In Uzbekistan, forests are the main habitat for the majority of existing species of plants, animals and mushrooms that cannot survive in other environment but in forests only.

Uzbek forests, though they are occupying small areas, correspondingly influence climate, availability of clean water and air. They protect agricultural lands, provide environment for people's comfortable habitat and recreation activities with enabling biodiversity conservation. Forests, in many ways, impact the quality of environment, and extent to which environment suits to people's comfortable and healthy living conditions. They efficiently clean the ambient air from dust and other harmful substances that subside on the surface of leaves and needles of trees but are washed out to ground by rains. Through evaporating substantial amounts of water, forests are maintaining the higher level of air humidity and protecting themselves and adjacent lands from aridity.

Within the strict continental climate and with over 50% of saline and degraded lands, forests are of the greatest importance in Uzbekistan. As it is well known, trees perform the colossal geochemical and energy functions on generating active oxygen in atmospheric air. In particular, forests are maintaining equilibrium of ozone layer, which protects humanity and animals from ultraviolet rays. They also play an important role in reducing surface runoff and its transformation into underground one, and thus forests contribute to mitigation of water

erosion of soils.

Forests render multiple ecosystem services. They are natural long-term CO_2 sinkers as forests sink and capture carbon dioxide, accumulate it then as organic matter in plants, their residues and soil but generate and emit oxygen, which is vital for all wildlife. In Uzbekistan, potential of CO_2 sinking is estimated at 2.53 million tons per annum, of which 0.58 million tons can be captured through forestation implemented at national forest stock lands, and 1.95 million tons through activities can be implemented in agricultural lands thanks to the potential depositing carbon dioxide by protective forest plantings.

The Aral Sea is located in the northwest of the economy, and straddles its border with Kazakhstan. During the last quarter of the last century, humanity had witnessed a dramatic degradation of one of the world's major land-locked water objects, the Aral Sea. The UN Secretary General has emphasized that drying of the Aral Sea is one of the most serious global environmental disasters, and declared that combating its negative consequences is common responsibility of the whole world but particularly the Central Asian economies. Water volume in the Aral Sea has been drastically reduced in almost 10 times but its surface area was decreased in 4 times. Area of its exposed bed has reached 4.5 million ha with leaving behind a salt and sand desert spread over 30,000 km^2. Changes in climate, landscape, fauna and flora as well as intensification of salt and dust transportation over the surrounding territories are the main reasons for aggravating environmental challenges that both directly and indirectly affect the quality of life and health of millions of people living in the Aral Sea basin. Annually, over 75 million tons of dust and harmful salt particles are emitted into the atmosphere. Clouds of dust from the exposed bed of the Aral Sea can reach up to 400 km in length and in width. Based on expert surveys, dust was found in the glaciers of Pamir and Tyan Shan mountains and even in Arctic. Protective forests have been planted in the Aral Sea region to fix the moving sands and prevent further expansion of salt transfer and large-scale desertification. Actually,they cover significant areas of the exposed bed of the Aral Sea. Annually, thousands of forest plantings are planted at the exposed bed of the Aral Sea. To protect the agricultural lands from harmful substances and salts, it is planned that over 1 million ha of forest plantings will be planted at the exposed bed of the Aral Sea by 2030.

The problems related to the Aral Sea catastrophe are at the highest agenda of the world community. In this regard, the Executive Committee of the International Fund of Aral Saving (IFAS) and the UN Economic Commission for Europe (UNECE) have signed a joint appeal to support efforts on afforestation and forestation in the Aral Sea basin within the framework of the 8th Ministerial Conference "Environment for Europe" held in Batumi, Georgia on 8-10 June 2016. The appeal reflects the intentions of the parties to cooperate in implementation of projects aimed at improving environment situation in this region, preventing salt and dust transfer, fixation of moving sands, reducing wind erosion of soils as well as improving health of the population and restoration of flora and fauna in the Aral Sea region.

Massive forest, forest shelterbelts and even particular trees are of the great importance for conservation and protection of the adjacent productive agricultural lands as they prevent soils and crops from harmful impacts by strong winds, increase of climate aridity, erosion and other unfavorable natural exposures.

One way for conservation of landscape and biological biodiversity, and cultural heritage is establishing protected areas. To enable biodiversity conservation in the Aral Sea region, 10 new protected national parks with the total area of 3.7 million ha will be established, and areas of water reservoirs and lakes to further develop fishery will be increased by 2019.

Thus, in accordance with the Resolution of the Cabinet of Ministers "On the Action Programme on environment protection in the Republic of Uzbekistan for 2013-2017", the activities are implemented within the forestry sector that are aimed at further improving environment situation, efficient use of natural resources and introducing environment standpoints of sustainable development into the national economy' sectors.

Besides, in Uzbekistan, the esthetic and recreation importance of forest ecosystems is enormous as they complement the world-known architectural ancient monuments (Samarqand, Bukhara, Khiva, etc.) and make them more attractive for conducting various scientific, research and educational programs.

Forests contribute to development of tourism sector. Actually, ecotourism in forests and in particular in mountain forest zone starts to be promoted and developed in the economy.

2.1.2 Economic significance of forestsand woodlands

The commercial use of Uzbek forests is prohibited. At the same time, the considerable part of population (49%) live in rural regions of Uzbekistan, and therefore their life and wellbeing are directly linked to forests and other categories of lands of the national forest stock. Though those lands are poor forest-covered, they provide various opportunities and benefits for local people. The specific feature of majority of natural ecosystems is their increasing fragility due to climate aridity. In this regard, the ecosystems' resilience to external impacts is quite low but any anthropogenic intervention becomes an additional factor for accelerating the degradation of the national ecosystems. Therefore, one of the nationalized Millennium Development Goals is ensuring environmental sustainability. Forestry contributes to achieving the goal and increasing wellbeing of the economy's population. One of the key activities implemented to achieve the goal is forest plantings.

In particular, during the last decades, forest plantations were established at 740,000 ha in the Aral Sea region, including 310,000 ha of the exposed bed of the Aral Sea. This resulted in transfer of over 230,000 ha into the forest-covered land category.15,000-16,000 ha of forest plantings are planted annually at the exposed bed of the Aral Sea. During last 13

years, overall area of forest plantings was increased in 2 times: forest lands amounted to 1.37 million ha (3% of the total territory of the economy) in 2000 but they have reached 3.33 million ha (7.3% of the total territory of the economy) by 2013. This reduces economic losses related to environment degradation and contributes to improving wellbeing of population living in the Aral Sea region, and the regional development.

However, commercial utilization of timber resources is not implemented in Uzbekistan due to the limited forest resources of the economy as well as importance of their non-timber benefits, in particular protective and environment functions. GDP of Uzbekistan is US$ 198,823 billion but forestry sector share is less than 1%, and this is the reason why Uzbek forestry is not considered as a priority sector of the economy, though forestry comparing with other sectors of the economy can be the best way to meet all requirements and principles of the green economy concept.

2.2 Financing and investment in forests and forestry

The investments into forestry sector comprise the targeted funds allocated from the central government budget and local administration budgets as well as funding provided by the relevant ministries, government agencies, and other organizations as forest users. This is supplemented with the own incomes of forestry institutions generated through rendering payable services to legal entities and individuals, international donor grants and contributions by environmental NGOs, as per the particular pricelist adopted by the government.

In 2015, the provisions on regulation procedure and payment for utilization of forest resources have been adopted in Uzbekistan in accordance with the government resolution “on measures aimed at further improving utilization of flora objects”. This legislation regulates utilization of forest resources, promotes development of domestic pharmaceutical industries, enables increasing assortment of nationally produced drugs, and supports systematic growing and harvesting wild plants as well as their processing and production. It also provides a ground for ensuring a favorable environment for entrepreneurs that are interested in export of non-timber products, and contributes to further liberalization of external economic activities by entrepreneurs and private business.

The sites of state forest stock lands shall be leased for utilization to the temporary forest users by the permanent forest users on the payable basis. This includes cattle pasture, haymaking, placement of beehives and apiary, collection of twigs and brushwood without felling the trees and bushes, utilization of sites in the state forest stock lands for cultural and educational events, and forest sites can be allocated for health improving, recreation, aesthetic, scientific and research purposes.

All above listed forest utilization types are payable. Those payments are incomes received by the permanent forest users. Payments for forest utilization received by the permanent

forest users such as government bodies and agencies shall be transferred into their budget development funds. Payments for forest utilization by the legal entities shall be done through bank transfer, but by individuals in cash and/or through bank transfer as well.

Thus, the incomes received from the rendered services and production activities of the forestry farms envisaged by the national legislation are an important source of funding to ensure the sustainable management of forest ecosystems. Procedures of payment for forest use and utilization of flora, and procedures on obtaining permissions for use of flora objects are set up by the Resolution of the Cabinet of Ministers "*On measures on further improving utilization of flora objects*", #278 of 30.09.2015. The amounts of payments imposed for particular types of forest utilization are determined through the corresponding factor applied to the minimal wage size. In 2015, the public expenditures in forestry amounted to UZS 11,550,811,000 (US$ 7,043,000[①]).

Taking into consideration the importance of forestry, the Cabinet of Ministers has adopted a particular Resolution #168 in June 2016. According to such resolution, a Forestry Development Fund is to be established under MFD. Such Fund is aimed at forming funds that will be invested into forestry development to strengthen material and technical basis of forestry farms, and the funds will also serve for increasing efficiency of protection, conservation, reproduction and rehabilitation of flora and fauna at the land of the state forestland fund.

The funding of the Forestry Development Fund should be sourced through issuing permissions for use of the state fund forestlands; compensations for flora and fauna related damages done at state fund forestlands (excluding the state reserves); issuing permissions for cattle pasture, haymaking, placing beehives and apiaries, collections of brushwood and faggot-wood without logging at the state fund forestlands; utilization of plots at the state fund forestlands for cultural and educational, health improving, recreation, and aesthetic purposes; and also should be provided through donations and by philanthropists.

The available funding can be used *inter alia* by MFD for development of targeted programmes on forestry development and projects focused on development of legal and regulation documentation related to forestry to promote introducing innovative approaches and modern technologies. Funding can be also provided for forest selection, enabling funding of forest regulation and design-exploration work, arranging mini-shops on forest production processing; and developing beekeeping, poultry-farming, livestock, fishery, etc.

2.3 Forests, livelihoods and poverty

The agenda of Sustainable Development Goals (SDGs) is for the period of up to 2030. It is

① Exchange rate is US$ 1 = UZS 1,640 (as of December 2010).

recognized that food security, people's welfare and management of natural resources are interlinked and cannot be considered separately. At the same time, it is commonly recognized that sustainable forestry and agriculture management, and their integration into land use planning are of the paramount importance for SDGs achieving and ensuring food security and combating the climate change.

The forests and trees well integrated into the agricultural landscapes can serve for increasing productivity of agriculture. They can also enable ensuring food security for rural population, as they are key sources of food, energy and income-generation.

Forests and trees cover just a very limited part of Uzbekistan's territory. However, forest ecosystems can significantly contribute to increasing welfare and livelihood of the substantial part of rural population in the economy. Such contribution could be both direct (e.g. timber and firewood, non-timber, etc.) and indirect (e.g. fixing moving sands, rehabilitation of degraded pastures, establishing protective forest belts and forest nurseries to grow the planting stock, etc.).

Uzbekistan possesses significant natural resources and distinctive agro-climatic capacity that allows harvesting two yields per year. Obviously, the best way to use such capacity will be the best way to increase living standards and welfare of population.

In this regard, efficient use of natural ecosystem resources, including forest ones, has social and economic importance for sustainable livelihood of population living in and/or nearby the forestlands. Application of new methodologies, approaches and technologies requires availability of relevant experience and skills of both forestry and nature protection employees and professionals and staff of local administrations as well as raised awareness of local inhabitants and communities. For instance, since the past rural inhabitants use ecosystem services such as use of timber for construction needs and as firewood, harvesting herbs and food grasses, collection of herb seeds, hunting, haymaking, cattle pasture and fodder production, collection of mushrooms and berries, huts and fruits, etc. However, the best practices on joint forest management, community-based forestry, and/or agroforestry are methodologies and technologies that application and introduction in Uzbekistan have been initiated recently. Currently, a system of agroforestry envisaging poplar planting as protective forest belts in combination with growing cotton and/or wheat at irrigated lands or forest-pasture system focused on development of walnut plantations in combination with fodder plants and/or fruit berry shrubs can be efficiently implemented in Uzbekistan and in the Greater Central Asian region.

However, prior to the larger-scale introduction of above practices, it would be necessary to undertake the corresponding cost-benefit analysis. To ensure a complex approach, it would be also worth to make estimations on such indicators as cost of activities on environment protection and water consumption. At the same time, it is required that representative of

local population plays a key role in planning and implementation of activities on conservation, reproduction and protection of the neighboring forests, and receives incomes and benefits from implementation of those initiatives.

It is also highly desirable that they cover some costs related to each initiative implementation through contributing their inputs in the form of funds, labor and equipment and sharing their experience and expertise. Such approach allows increasing the ownership of people and communities for the implemented activities, and enabling them to assess their own development capacities and opportunities.

For instance, in the desert areas, it would be possible to achieve stability of ecosystems, fixation of the moving sands, conservation of biodiversity with the simultaneous creation of favorable environment for social and economic development of local population through implementation of best practices applied in agroforestry.

It is obvious that a systematic, targeted and laborious work will be required for efficient and effective implementation of the above-indicated approaches. The work shall be focused on strengthening and improving the system of monitoring the use of forest resources; increasing quality of training, education and professional skills of forestry employees and professionals; introducing relevant changes and amendments into forestry legislation; and raising the awareness of local people about importance of environment, social and economic values of use of natural resources and corresponding environment trainings and education.

Chapter 3 Forestry policy and legislation

3.1 Forestry policy

3.2 Short-term and long-term planning for forest development

3.3 The history and future of forestry development

3.1 Forestry policy

The forests in Uzbekistan are the key natural elements and integrated part of biodiversity, and perform important environment and social functions as well as playing a significant role in developing national economy and improving environment. In Uzbekistan, forests are the state property and constitute the united forest stock, and including the forests of national importance, and the forests belonging to government forestry bodies but utilized by other sectoral agencies and legal entities. There are 16 national forest farms, 48 sub-national forest farms, 5 forests and hunting farms, 6 specialized forest farms, 7 scientific and experimental stations, 1 national park, 5 national reserves and 2 biosphere reserves. Based on the national classification, forests are subdivided into:

- Shelterbelts along rivers, lakes and water reservoirs;
- Anti-erosion forests;
- Protective shelterbelts along railways and highways;
- Forests in desert, semi-desert zones;
- City forests and forest parks;
- Forests in green zones around cities, settlements and industrial centers;
- Forests around healthcare facilities;
- Especially valuable forest stands;
- Forests in nut-production zones;
- Forests in fruit-tree plantations;
- Forests in national parks and natural reserves;
- Forests of scientific and historical importance.

Conservation, protection, utilization and planting of the forests are controlled by the Cabinet of Ministers, MFD, local administrations and other government authorities and bodies. MFD is responsible for forest management at the regional level through the seven subordinated regional forestry centers.

The Cabinet of Ministers is in charge of the following:

- Implementation of a uniform state policy on protection and rational use of forests;
- Control of the SFF;
- Establishment of legal orders on determining categories of forest protection;
- Establishment of the order of collecting fees and their rates for forest use;
- Organization and implementation of state control over preservation, protection, use and reproduction of forests;
- Establishment of the order of conducting state inventory of forests and maintaining a state forest cadaster and some other issues.

The local administrations are responsible for:

- Providing the SFF sites to legal and private entities upon approval of the state forestry

bodies, except for the forests of state reserves and forest reserve zones of the state national nature parks;
- Conducting state inventory of forests and maintaining a state forest cadaster;
- Exercising state control over preservation, protection, use and reproduction of forests;
- Making decisions on restrictions, suspension and termination of the activity of enterprises, establishments and organizations in cases of causing harm to the state of forests;
- Establishment and regulation of the norms of cattle grazing in the forests and other types of use of forest resources in collaboration with the state forestry bodies;
- Organization of environmental education for the public in the field of preservation, protection, use and reproduction of forests.

MFD had been established in accordance with the Decree of the President of the Republic of Uzbekistan "On Transformation of the State Committee on Forestry into the Main Department of Forestry under the Ministry of Agriculture and Water Resources of the Republic of Uzbekistan", #UP-2536 of 07.02.2000. MFD performs the functions of the government body responsible for forestry management in Uzbekistan.

According to the above-mentioned decree, MFD is responsible for:
- Monitoring and control over forestry legislation, application of technical specifications related documentation on the implementation of forestry and hunting operations;
- Forest management including forest operations, reproduction, conservation and protection of forests, state reserves, natural parks and other protected natural territories within the forestry fund area;
- Implementing a uniform technical policy and standard aimed at overall expansion and rational use of the forestry fund area;
- National forest inventory and studying of forest land, fauna and flora;
- Promotion of scientific innovation and best practices in forestry;
- Development and implementation of measures on reforestation and protective forestation, organization of erosion control planting operations on hillsides, in ravines and wastelands;
- Implementation of measures on combating desertification on agriculture land;
- Protection of forests from fires, unauthorized cuttings and other forestry violations, protection of forests against pests and diseases, including improvement of the systems of forest protection;
- Conducting conservation activity and maintaining hunting facilities in subordinated territories;
- Departmental management and supervision of hunting facilities, ensuring observance of rules, norms, terms of hunting on forest fund territory;
- Organizing development and implementation of a uniform strategy for decorative gardening on the basis of an assessment of needs of local and foreign markets;
- Implementation of measures for the preparation and production of medicinal and food plants, products of subsidiary farming, gardening, and creation of a specialized divisions for these purposes;

- Increasing the level of economic independence of forestry enterprises, and specialized forestry enterprises on production of medicinal herbs, and adapting them to a market economy for the purpose of improving their financial situation;
- Attraction of foreign investments, creation of joint ventures, development of private entrepreneurship, and small businesses in the sphere of forestry;
- Capacity development of personnel for forestry enterprises and organizations.

Moreover, MFD regulates relations in the field of utilization, protection and conservation of the state fund forestlands, reproduction and increasing productivity of forests. It also develops and introduces the legal and regulatory framework of forestry, implements programmes aimed at efficient utilization and conservation of biological and landscape diversity, strengthening the key environment, nature protection, recreation and other functions of forests. At the same time, the Head of the MFD is the DeputyMinister of the Ministryof Agriculture and Water Resources of the Republic of Uzbekistan, who is appointed by the decision of the Cabinet of Ministers.

The overall provisions are indicated in the five sections of the Annex to the decree that describe the key tasks and directions of its activities, functions, powers, and organizational arrangements. Over 7,000 people include 300 officials of the senior management and decision-makers and up to 1,100 engineering and technical staff. However, at least 3,000 technical professionals and up to 500 administrative staff are required for more efficient forestry management.

Within the regions, the provincial forest farms and self-sustainable forestry enterprises implement forestry management. The organizational structure of the MFD is presented below (Figure 3-1).

Moreover, the following subdivisions of the MFD are an integrated part of its organizational structure:

- Republican Scientific and Production Center on ornamental horticulture and forestry.
- Department of Natural Reserves, Parks and Hunting.
- Republican Scientific and Production Center on Skills Upgrading.
- Scientific and Research Center “SHIFOBAKHSH” on growing, processing and packaging herbs and food plants.
- Republican Forest Seeds State Station.
- Uzbek Forest Regulation and Design-Exploration Enterprise “UZGIPROURMONLOYIKHA”.

The major part of forests (about 85% of total stock) is belonging to MFD, and other parts are under the Tashkent Province Khokimiyat (Mayor) (600,000 ha), and SCNP (90,000 ha).

Figure 3-1 Structure of the Main Forest Department under the MAWR

SCNP is entrusted with government monitoring of observation of inter alia legislation on forest utilization and protection.

While MFD reports on implementation of its annual planning and delivers budget funds allocated for forestry needs, the Committee performs government control on:

- shape of forest ecosystems;
- ensuring conservation of forests, valuable natural landscapes, water and agricultural lands protecting/regulating, and other functions of forest plantings;
- managing natural reserves, and maintaining the protected areas.

The key stakeholders and targeted beneficiaries involved in activities related to forestry in Uzbekistan are representatives of the following government organizations:

- The Main Forestry Department (MFD) under the Ministry of Agriculture and Water Resources (MAWR);
- National Centre of Geodesy and Cartography of the State Committee for Land Resources, Cadaster, Cartography and Geodesy;
- The State Committee for Nature Conservation;
- The local forestry farms (leskhozes) under the MFD;
- The Tashkent Province Khokimiyat (Municipality);
- The State Concern Uzavtoyul (Uzbek Highways);
- The Uzbekistan Academy of Sciences;
- The Joint State Concern "Temir Yui" (Uzbek Railways);
- Authorities at district and province levels.

All the above-mentioned agencies have direct and/or indirect roles in the SFM in the economy.

The State Committee for Land Resources, Geodesy, Cartography and State Cadaster deals with forest-related data and information.

SCNP has a particular role in the SFM. This agency has a controlling function over the MFD and its forest farms (leskhozes). It checks whether they are acting in accordance with established rules and regulations of the SFM. This agency also has a special role in developing policies for the management of protected areas. Most protected areas come under the management of the MFD.

The Tashkent province municipality, Khokimiyat is directly responsible for managing forest resources in Tashkent province. This is the only case among 12 regions in the economy, and it is due to political reasons. Forest farms managed by this authority do not come under the responsibility of the MFD; consequently, there is a lack of data exchange between the MFD and Tashkent province municipality.

The State Concern "UzAvtoYul" (Uzbek Highways) is included among the stakeholders because all forests along highways come under this agency, which is consequently active in forest management. The government has formulated programmes to carry out afforestation along highways; that is why this agency collaborates closely with the MFD and forest farms.

The Uzbek Academy of Science focuses mainly on forest fauna and flora and its activities are scientifically oriented. The role of the Academy could come under a more thorough analysis of National Forest Inventory (NFI) data with regard to other data sources; this may bring new insights into the NFI data collected, relevant to the forestry sector.

The Joint State Concern "Temir Yul" (Uzbek Railways) has a role similar to that of "UzAvtoYul" (Uzbek Highways). Forests along railways come under the management of this agency.

Authorities at district and province levels coordinate activities of forest farms in terms of integrating forestry management plans into provincial programmes.

There are some non-governmental institutions involved in forestry activities including farmers' associations, rural communities, non-governmental organizations, educational and research institutions and the private sector. There are about 70 NGOs dealing with environmental issues in Uzbekistan. Moreover, an association of environmentally oriented NGOs called EcoForum exists in the economy (http://www.ecoforum.uz). The most recognized Uzbek NGOs are as followed: "Ecological Movement of Uzbekistan" that is a NGO focusing on the forestry sector such as afforestation, landscape gardening and ecology, an "Association for the Ecologically Clean Fergana" "Youth Ecological Network of Uzbekistan" "Republican Farmers' Council" and "People's Self-governance Organizations" at the district level.

The forestry legislations of the Republic of Uzbekistan include the Law "*On Forestry*" adopted in 1999, and other legal documentation. The objectives and tasks stipulated by the legislation are regulation of forest-related interrelations aimed at forest protection, conservation, efficient utilization, and increase of productivity as well as protection of relevant rights of legal entities and individuals.

The Law "*On Forest*" included 43 articles clearly stipulates the functions and protective categories of forests, states that forests are public property, and explains such terminologies as 'state fund of forestlands' 'lands of the state fund of forestlands' 'plots of the state fund of forestlands', etc. This law also regulates the public management of protection, conservation, utilization and reproduction of the forests. It determines the jurisdiction of the Cabinet of Ministers and local administrations related to regulation of forestry-related interrelations. Moreover, it identifies the agencies directly responsible for control and monitoring, protection and conservation, utilization and reproduction of the forests. The law includes the key provisions for organization of forestry, forest protection, describes the key principles of forest regulation and forest utilization, and explains on how public forest stocktaking shall be undertaken, and what the state forest cadaster is.

In the law, there is an article related to financial aspects of forestry, in particular funding and economic incentives for enabling protection and conservation, efficient utilization and reproduction of the forests. In this regard, it shall be emphasized that the Forestry Development Fund has been established under the MFD in June 2016 based on the particular *Resolution of the Cabinet of Ministers*. Financial resources of such Fund are envisaged for improving forestland infrastructure, in particular for development of forestry, strengthening material and technical basis of forest farms, and protection, conservation, reproduction and rehabilitation of flora and fauna available at the state fund forestlands.

The law includes issues related to forest utilization and principles of providing rights of forest utilization, with differentiation of the rights and responsibilities between the permanent

forest users and the temporary forest users. It stipulates types of forest utilization, guarantees of forest user rights, and procedure of terminating the right of forest utilization as well as cases of such right's restriction, suspension and/or ban.

There are also articles focused on afforestation, forestation, increasing forest productivity, and protection from forest pests, diseases and other negative impacts. The procedure of location, design, construction and commissioning of forest enterprises, facilities, and other sites impacts the shape and reproduction of forest along with the procedure of conducting work that are not related to forestry.

In general, utilization of natural resources may be general or special. General use of flora is undertaken in agreement with landowners and land users, free of charge and in the amounts limited to livelihood needs. Special use of flora is allowed through a permit system.

Forest utilization can be permanent or temporary. Permanent forest users are forestry enterprises, institutions and organizations, to which the forest reserve is belonging to and those having rights for permanent ownership. In many cases, temporary forest users are local communities. Forest management can be implemented at the short-term basis, up to three years, or long-term one, up to 10 years. Norms and procedures applied to public authorities are determined by the government agencies responsible for their lands and in agreement with SCNP. The fees, their rates and collection procedures are determined by the Cabinet of Ministers. The Article 26 of the Law is dedicated to logging of wood and shrub plantings.

According to Article 12, the control over forest protection, conservation, utilization and reproduction is implemented by SCNP, apart from the other government agencies. In this regard, to streamline the range of officials entrusted with decision-making on use of forests and flora, SCNP has adopted templates of forms such as "Permission for logging of wood and shrub plantings aside from the state fund forestlands" and "Permission for haymaking and cattle pasture at lands out of the state fund forestlands". SCNP also developed and adopted the "Regulations on procedure on issuing and accounting of permissions for logging of wood and shrub plantings out of the state fund forestlands, and for haymaking and cattle pasture at lands that are out of the state fund forestlands" (the Order of SCNP, #01-705 of 15.05.2007 registered by the Ministry of Justice of the Republic of Uzbekistan, #1686 of 04.06.2007).

To get permissions from SCNP for logging and other types of forest and flora utilization, there are adopted templates for "Permission for collection and production of wild herbs, food and technical plants at the state fund forestlands", "Forest card for haymaking at pasturelands", "Forest logging card for the state fund forestlands", and "Regulations on procedure of issuing and accounting permissions for collection and production of wild herbs, food and technical plants at the state fund forestlands, and forest cards tickets for haymaking and cattle pasture at the state fund pasturelands, and forest logging cards for the state fund forestlands" (the Order of SCNP, #68 of 17.06.2007 registered by the Ministry of Justice of the Republic of

Uzbekistan, #1700 of 03.08.2007).

Overall, the adopted procedure on issuing permissions for various types of forest ecosystem use is one of the factors aimed at conservation and efficient utilization of forest ecosystems. For instance, since October 1, and until December 30, 2016, SCNP has undertaken forming quotas for particular use of wild plants based on the list of kinds and amounts of wild plants collected and produced for 2017. It is obvious that such approach will enable conservation of plants.

The environment protection legislations of the Republic of Uzbekistan are based on and include:

- Constitution of the Republic of Uzbekistan (1992);
- Law "*On Nature Protection*" (1992);
- Law "*On government Sanitary Inspectorate*" (1992);
- Law "*On Water and Water Use"* (1993);
- Law "*On Metrology*" (1993);
- Law "*On Protection of Atmospheric Air*" (1993);
- Law "*On the Strictly Protected Areas*" (1993);
- Law "*On Protection and Utilization of Fauna*" (1997);
- Law "*On Protection and Utilization of Flora*" (1997);
- Law "*On Geodesy and Cartography*" (1997);
- Law "*On Readjustment of Agricultural Enterprises*" (1997);
- Land Code of the Republic of Uzbekistan (1998);
- Law "*On Farming*" (1998);
- Law "*On Dekhan Farming*" (1998);
- Law "*On the State Land Cadaster*" (1998);
- Law "*On Safety of Hydropower Facilities*" (1999);
- Law "*On the State Cadasters*" (2000);
- Law "*On Protection of Agricultural Plants from Pests, Diseases, and Weeds*" (2000);
- Law "*On Wastes*" (2002);
- Law "*On Protected Areas*" (2004);
- Law "*On Introducing Changes and Amendments into Some Legislation Documentation of the Republic of Uzbekistan to Deepening Economic Reforming in Agriculture and Water Sectors*" (2009);
- Law "*On Introducing Changes and Amendments into Some Legislation Documentation of the Republic of Uzbekistan*" (2010);
- Law "*On Environment Control*" (2013);
- Law "*On Sanitary and Epidemiological Welfare of Population*" (2015);
- Law "*On Introducing Changes and Amendments*" into the Law "*On Protection and Utilization of Fauna*" (2016);
- Law "*On Introducing Changes and Amendments*" into the Law "*On Protection and Utilization of Flora*" (2016).

In Uzbekistan, a number of strategic legal documentations such as National Action Plan on Environment Protection, National Action Plan on Environment Hygiene, National Strategy and Action Plan on Biodiversity Conservation, National Action Plan on Combat Droughts and Desertification, National Strategy on Renewable Energy, National Concept on Education to Achieve Sustainable Development", Complex Programme of Measures on Mitigation Consequences of the Aral SeaDisaster, and Rehabilitation and Social and Economic Development of the Aral Sea Region for 2015-2018 have been adopted and are aimed at managing the environment challenges and problems. To ensure their implementation, the corresponding mechanisms, including financing through attracting external investments, have been developed. The legislations related to environment and nature protection activities are as follows:

- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan "On Action Programme on Environment Protection in the Republic of Uzbekistan for 2013-2017, #142 of 27.05.2013 (it was planned that UZS 89.39 billion, US$ 1.635 billion and EUR 57.63 million will be allocated to implement the Programme);Within the Programme, an updated National Strategy and Action Plan on biodiversity conservation as well as National Communication of the Republic of Uzbekistan to UNFCCC;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan "On adoption of the Regulations on public monitoring of environment in Uzbekistan", #111 of 03.04.2002;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan "On adoption of legal and regulatory in the field of environment control", #286 of 08.10.2015;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan "On adoption of standard regulations on implementation of public environment control", #287 of 08.10.2015;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan "On approval of taxes for calculation of size of compensations for damages to flora in Uzbekistan", #293 of 27.07.1995;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan "On measures on further development of timber poplar-based production and establishing plantations of the fast-growing species", #62 of 08.02.1994;
- Resolution of the Cabinet of Ministers of the Republic of Uzbekistan "On measures on further improving financing of forestry development", #198 of 10.06.2016;
- Decree of the President of Uzbekistan "On measures on cardinally improving the land reclamation system", #PF 3932 of 29.10.2007;
- Resolution of the president of Uzbekistan "On the National Programme on irrigated land reclamation improvement for 2008-2012" of 19.03.2008;
- Currently, development of an updated National Action Programme on combat desertification and droughts is under its final stage.

The agreements and documentations of regional level include:

- The Framework Convention on environment protection for sustainable development in Central Asia (Turkmenistan, 2006);

- Sub-regional Action Programme for Central Asia countries on combat desertification in the context of the Convention on Combat Desertification (Cuba, 2003);
- Regional Action Plan on Environment Protection in Central Asia (Kazakhstan, 2001);
- Agreement on terms of functioning of the Regional Environment Center in Central Asia (Kazakhstan, 2000);
- Agreement on cooperation in environment protection and efficient use of natural resources between the governments of the Republic of Kazakhstan, Kyrgyz Republic and Republic of Uzbekistan (Kyrgyzstan, 1998);
- The Nukus Declaration on problems preventing sustainable development of the region of the Aral Sea basin of the Central Asia States and international organizations (Uzbekistan, 1995);
- Agreement on joint efforts to cope with problems of the Aral Sea basin and Aral Sea Region, improving environment situation and ensuring social and economic development of the Aral Sea Region (Kazakhstan, 1993).

The list of international environment agreements and conventions signed and/or ratified by the Republic of Uzbekistan:

- The UN Framework Convention on Climate Change (joined in 1993);
- Kyoto Protocol to UN Framework Convention on Climate Change (1999);
- Vienna Convention on Protection of Ozone Layer (1993);
- Montreal Protocol on Substances that Deplete the Ozone Layer (1993);
- London and Copenhagen Amendments to Montreal Protocol on Substances that Deplete the Ozone Layer (1998), and Montreal and Beijing Amendments to the Protocol (2006);
- Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (1996);
- UN Convention on Biological Diversity (1995);
- UN Convention to Combat Desertification (1995);
- Convention on International Trade on Endangered Species of Wild Flora and Fauna (CITES) (1997);
- Convention on the Conservation of Migratory Species of Wild Animals (1998) (the **African**-Eurasian MigratoryWaterbird Agreement (AEWA) was signed within the Convention in 2005);
- Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD) (1993);
- Convention on Wetlands of International Importance (Ramsar Convention) (2002).

3.2 Short-term and long-term planning for forest development

The five-year planning approved by the MAWR is the key and standard form of the planning of social and economic development of forestry sector in Uzbekistan. Such planning is based on the methodology on forestry development planning, which includes development of the relevant social and economic indicators for next five-year period. At the end of this reporting

period, MFD will report to MAWR on achieving the corresponding targets and quality of implementation of the planned tasks and activities.

Currently, the five-year planning is *inter alia* in the process of adjusting to market environment, and targeted at reducing the production costs and optimized managerial decision-making. Such planning justifies efficiency and effectiveness of activities required for improving and arranging the organizational and production structures of the MFD. In Uzbekistan, forest is of the 1st category, and therefore the key objective of the five-year planning is conservation of the environment, water protection, sanitary and hygienic, recreation and other valuable forest functions, with their simultaneous utilization, given such utilization is compatible with the key purpose of the protective forests and in line with their primary functions.

The key planning indications of the planning such as amounts and areas of forest planting (including plantings done at the exposed bed of the Aral Sea), planting stock (quantity of saplings, seedlings, and seeds), sanitary felling, timber and non-timber production, etc. characterize the operational efficiency of the MFD. In addition to the specific indicators, there are some economic indicators such as amounts of allocated and delivered funds, the funds for awarding bonuses, wages and salaries of the MFD's employees and staff. The indexation of wages and salaries is conducted based on the corresponding decrees of the President of Uzbekistan.

Based on the five-year planning, MFD management develops and adopts annual development plans for each forest farm. The one-year plans include targets and indicators that are similar to the ones indicated above, with consideration of the specialization and features of each particular forest farm.

Based on the achievement of the annual plans, the most prominent forest professionals are awarded with monetary bonuses and/or moral appreciations by the MFD.

In Uzbekistan, development of the long-term national strategy on structural reforming of national economy up to 2021 is announced by the newly elected president (December 4, 2016) in 2016. It focuses on ensuring energy and environment sustainability. Within the context of the strategy, National Action Plan on combating desertification, degradation and droughts is under development and a Concept for forestry development up to 2030 has been drafted.

The main goal of the Concept is determination of the key development priorities for forestry sector. The priorities are focused on implementation of more efficient and effective measures aimed at conservation and accelerated reproduction of forest resources; strengthening environmental and protective functions of forests; resource-saving utilization of the state forest stock lands and forests; development of the corresponding social aspects of forestry

with consideration of best practices, gained experience; and changing regional and world development environments. Development and implementation of the concept would envisage revision of the MFD structure, development and adoption of the *Forestry Code* and key principles of forestry development along with the long-term forestry development scheme for next 50 years. This will also require introduction of changes and amendments into the relevant existing national legislation.

To achieve the above-mentioned tasks, improving the existing legal framework, developing forestry policies, monitoring their implementation that should result in conservation, improving the existing forests as well as further increasing forest-covered lands would be required. Introducing a system for joint forest management and improving forestland rent/lease relations are of the greatest importance, as they will ensure achieving sustainable social and economic benefits by local population through efficient utilization of forestlands and forests. Moreover, institutional capacity building and introduction of financial mechanisms to enable the SFM are crucial as well.

It is obvious that to estimate correctly the economic impacts on biodiversity conservation, and in particular on the shape of forest resources, it would be required to conduct an accurate analysis of the situation through conducting environment impact assessment for biodiversity and ecosystem services. In this regard, a particular attention shall be given to the activities focused on establishing, developing and involving the adequate institutional and human capacities required for development of methodology on assessment of economic value of forest ecosystems to be adjusted to local environment and circumstances. Such approach could enable increasing importance of forests that in its turn provides positive inputs into the process of national economy transition towards green economy path.

Implementation of the above listed tasks is complicated by limited forest resources available in the economy, and poor understanding of importance of non-timber related benefits. Therefore, the larger-scale and comprehensive utilization of protective and environment conservation functions of timber resources is promoted and planned in Uzbekistan. To achieve this, ecotourism, agro-tourism, and sports and hunting tourism will be introduced and promoted through establishing recreation zones, resorts, camping and development of sanatorium and health improving facilities, and the estimates can attract up to 2 million domestic and international tourists. This would serveup to 1 million local people and up to 1 million internationals and generate incomes in the range of US$ 500 million - US$ 4 billion per year. Moreover, this enables and promotes introducing technologies that save and/or efficiently use the nature resources such as drip irrigation, systems powered by solar energy and/or biogas within the large-scale projects on establishing nut and fruit plantations at 2.5 ha of lands, gardens and vineyards, crop farms, etc. at the non-irrigated and sandy lands (with potential payback period of 10 years for investments amounted to US$ 10 billion, and receiving the further annual profits). Large-scale plantation of pistachio, almond, walnut, buckthorn, dog-rose berries, herbs, etc. will be established, and production of eco-products

is considered, which payback period might be 10 years.

Implementation of international carbon-financing projects, e.g. planting the fast-growing trees (related to carbon sequestration and CO_2 sink) has some co-benefits, for example, attracting large amounts of climate financing and meeting national demand in wood and timber.

3.3 The history and future of forestry development

According to the publication on "*Forestry in Turkestan*" (2004)①, before the colonization by the Russian Empire, in Turkestan, which was included the territory of the present Uzbekistan, forest management was sporadic and primitive but hunting was implemented based on particular rules that was called as 'shariat'-based. The Regulations on Turkestan Management and Guidance on the state property and agriculture management in Turkestan were developed. This documentation stipulated the importance of the "procedure for public forest management and regulation, measures aimed at forestation development, and procedures on sale of forest products and their taxations".

The very first forest regulation activity was undertaken based on the Forestry Department of Turkestan during 1889-1897. Some evidences are available in archives and libraries of various national agencies; however, they are not systematized, but the majority of the historical documentations and reports are lost.

Within the *Code of Laws "On forestation, afforestation and forest work"*, with which enforcement of the Department of Agriculture and Public Properties was entrustedby the government order, it was requested: a) "to conduct work on forestation of mountain slopes to protect the agricultural lands from landslides and mudslides, and work on forestation of steppe and fixing moving/volatile sands; and b) to establish nurseries of wood and shrub species and seed storages in various locations to sell the planting stock to local population". Moreover, "the Department should provide the technical guidance of forestation to the individuals who would approach it with such request"②.

The resolution of the First Congress of Foresters, which recognized the great importance of water protective function of mountain forest and depleted the mountain forests due to illegal logging, forest fires and cattle pasture, was of critical importance for forestry in Turkestan. It was recommended to recognize those forests as protective ones, as they prevent formation of steeps, lands and rockslides, soil erosion, fast snow melting, formation of mudslides, and also protect springs and watersheds that fed all river basins in Turkestan. At the same time, it was emphasized that there is a particular group of artificially grown plantings established

① Forestry in Turkestan.K.S. Ashimov.2004.
② Notes on forestry in Fergana.Turkestan Bulletin, #16 and #20.1888.

along the irrigation canals, roads, etc. It shall be stressed that the early investigators of forest flora in Turkestan considered that the top priority for the public forestry is protection and conservation of tugai (riparian) and steppe forests. These forests were seriously affected by the voluntary and unregulated cattle pasture.

The first forest regulating and forest amelioration activities were initiated in autumn of 1879, when planting of acacia white, ailanthus and gleditschia were implemented in Aman-Kutan location. It shall be also mentioned that forestation was not the government planned activities though they were under monitoring and control of the Main Forestry Department of Turkestan.

After collapse of the Russian Empire and creation of USSR, overall provisions of the key "*Law on Forests*" (1921) were formulated and adopted. Moreover, Sub-Department of Forestry Industry of the Turkistan Soviet Republic was established, andconsisted of three units: administrative, forest regulation and reclamation, and hunting ones (1921). Afterwards, the People's Commissariat on Forestry and Forest Industry of the Uzbek Soviet Socialistic Republic was established (1936), which was further transformed into the Ministry of Forestry (1947), based on which the State Committee for Forestry was established (1962). Next, the latter was transformed into the Union-Republic Production Association "UzbekLes" that was then replaced by the State Committee on Forestry of the Republic of Uzbekistan (1991), which has been then transformed into the Main Forestry Department (MFD) under the Ministry of Agriculture and Water Resources (2005).

The activities implemented by the MFD are based on the national *Law "On Forestry"* (1999). According to Article 4 of the Law, forests are state property and national wealth, subject to rational use and protection by the state. Key issues addressed in this Law are presented below.

- All forests are an integral part of the SFF and include:
  (i) Forests of state importance, i.e. forests under the authority of state forestry bodies;
  (ii) Forests being used by other establishments and legal entities;
  (iii) The SFF does not include;
  (iv) Trees and groups of trees, field-protecting forest belts, as well as other wood and bush vegetation on agricultural lands;
  (v) Protective plantings on the strips along railways, highways, channels and other water bodies;
  (vi) Trees and groups of trees, as well as green plantings in cities and other habitations;
  (vii) Trees and groups of trees on farmlands and gardens.
- The establishment, maintenance, protection and use of wood and bush plantings, not included in the SFF, is regulated in accordance with the *Law on Protection and Use of Flora*.
- Lands of the SFF can be given for use to legal and private entities.
- Forest use can be of permanent and temporary nature.

- Permanent forest users are forestry enterprises, establishments and organizations, which are provided with lands of the SFF under a permanent tenure agreement.
- Temporary forest use can be of short-term (i.e. up to 3 years), and of long-term (i.e. up to 10 years).

It is necessary to outline that long-term planning in the forest sector, in many respects, has maintained the approaches of the previous style of centralized planning system. These are economic plans, where the quantity indicators of various specific types of work are set up for sowing, planting, supporting measures for natural regeneration and afforestation. Forestry management, its monitoring and activity evaluation are still implemented based on the out-of-date methodologies with applying inefficient approaches developed in the past.

Chapter 4 Best practices for sustainable forest management

4.1 Soil and water conservation
4.2 Desertification control
4.3 Rangeland degradation control
4.4 Salinization control
4.5 Forest fire and disease prevention
4.6 Biodiversity conservation
4.7 Rehabilitation of degraded forests
4.8 Comprehensive utilization of forest resources and non-timber forest products

4.1 Soil and water conservation

Up to 46% of irrigated lands of Uzbekistan are exposed to salinization. High salinization is a major environmental problem. In Uzbekistan, decrease of quality of water and land resources is observed in the nationwide scale. Unfortunately, there is still no any comprehensive assessment of economic consequences of land degradation related to reducing ecosystem productivity and services[①]. The substantial part of irrigated land suffers from salinization, high level of underground waters and water erosion, losses of agro and biodiversity and other hazards. This restricts the development of agriculture and other sectors, and aggravates problems related to low-income part of population.

To sort out the above-indicated problems, improving planning and water and resources management is of the paramount importance. The key approaches to achieve this are as follows:

- Improving system of accounting and water quality management;
- Improving the hydro and environment monitoring;
- Institutional development in water use and consumption;
- Water saving through improving technical shape of irrigation system, development and implementation of measures aimed at accelerating transfer to water saving irrigation technologies, and efficient use of water resources;
- Support in implementation of a number of reforms in agriculture and strengthening role of Water User Associations and Associations of Farmers;
- Increase of knowledge and strengthening skills on sustainable water and land management;
- Regular increase of awareness and information about efficient use of natural resources and climate change by population;
- Introducing principles of 'clean' agriculture and decreasing utilization of mineral fertilizer and pesticides in agriculture;
- Increasing efficiency of water resources use, prevention of further land salinization and decrease of soil quality due to wider utilization of water saving technologies, modernization of irrigation systems, increasing ratio of irrigation canal efficiency and construction of infiltration reducing coverage in canals.

A possible avenue for reclamation of saline lands is the use of halophytic species (salt-loving plants) that remove salts from saline soils and water. This proposal builds on research already underway by targeting the cultivation and sustainable production of halophytes for forage and renewable bioenergy uses on unproductive, marginal salinized lands surrounding hundreds of small lakes in the Aral Sea Basin in Uzbekistan.

① Fifth National Report on Biodiversity Conservation of the Republic of Uzbekistan.State Committee for Nature Protection/UNDP/GEF.2015

Ecological Movement of Uzbekistan proposes the creation of an institutional and policy framework for environmental management with a special emphasis on marginal land resources utilization, land/water and ecosystem management and conservation.

4.2 Desertification control

Uzbekistan, because of its natural and geographical peculiarities, is very vulnerable to desertification and land degradation, and desertification is already occurred at the significant part of the economy's lands. The most acute environment disaster happened in Central Asia and induced by inefficient water use pattern is degradation of the Aral Sea and delta of Amudaria river. Currently, both are the largest desertification phenomena. Desertification, land degradation and droughts affect the population livelihood, living standards, health and habitat.

Currently, the process of updating the National Programme to Combat Desertification and Droughts is under its final stage. The key objectives of the Programme are as follows:

- Increasing level of recognition of desertification, land degradation and droughts as well as their impacts on social and economic development at national level;
- Development of responsive measures and actions to challenges, threats and stresses related to land degradation, desertification and droughts;
- Enforcement of observation of priorities and coordinated responsibilities by the key agencies during decision-making and for efficient fulfillment of national commitments and obligations to UNCCD in the context of combating desertification;
- National capacity building activities aimed at integration of combating desertification issues into the national and sectoral planning, into the monitoring system to implement consistent measures on elimination of factors provoking desertification, with involvement and participation of local population.

The significant contributions to combat desertification are provided by the *Multi-country Programme* "*Central Asian Countries Initiative for Land Management*" (CACILM). Within the programme, resource mobilization and development of project proposals on the priority, national activities have been undertaken. The project proposals were focused on the following:

- Activities of combating the irrigated-land salinization and mitigating climate change in the mid-stream of Amudaria river basin;
- Mitigation of drought impacts in the areas with the highest level of desertification risk with considerations of climate change;
- Land degradation economics, assessment and cost of ecosystem services;
- Sustainable management of mountain and valley forests.

Within the framework of pilot projects, the efficient approaches on increasing soil fertility were tested. For instance, planting of liquorice (Glycyrrhíza glábra) as perennial herbaceous

plant, liquorice (Glycyrrhiza) of the podded plant family (Fabaceae), or indigofera (Indigofera tinctoria L.) the podded plant family as well as use of phosphogypsum, which improves soil quality at the degraded lands, was proposed at the solonetzic soils ranged from heavy and clay soils to mellow and sandy soil compositions.

At the desert lands, MFD conducts forest reclamation activities aimed at the following:

- Establishing a system of protective forest belts;
- Planting around the large irrigation and main road networks;
- Fixation of moving sands and sand forestation through planting saxaul and other sandy species.

4.3 Rangeland degradation control

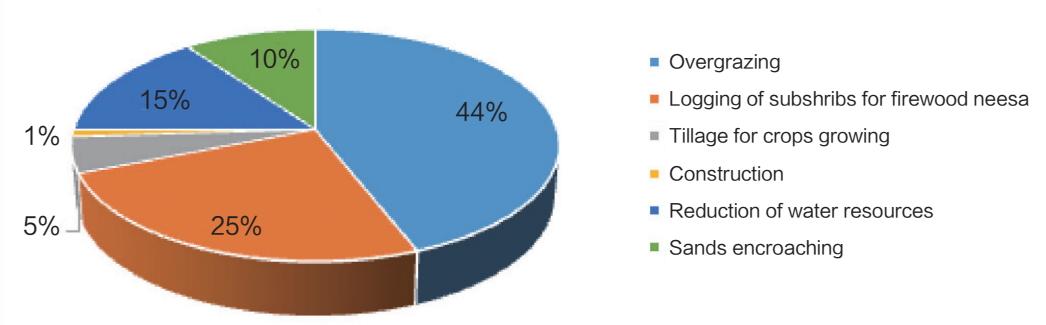
In Uzbekistan, over 19 million ha are pasturelands (approximate 46% of the total area of agricultural, forestry and/or reserved lands). Thus, pastures are the wide spread type of agricultural lands.

The state fund forestlands (a majority of which are deserts, dry steppe or deforested foothills) are actually used as pastures for livestock. Livestock is the most threat for reforestation for both lands of the state fund forestlands and lands located out of the state fund forestlands. Forestry and pasturelands have close ties with other sectors. For instance, the extensive pastures are dependent on irrigation agriculture in terms of the fodder. The current shortage of fodder is the major limiting factor that results in overgrazing occurred in autumn, winter and early spring seasons. Annually, the average rate of decrease of pasture productivity is 1.5%. At the arid pasturelands, the key root cause of degradation is excessive pasture by livestock (Figure 4-1)[①].

New approaches on pasture management and sustainable livestock are required for ensuring the more efficient utilization of pasturelands. Pasturelands use management is a complex issue, which requires a systemic approach. Within the transition to green economy, i.e. new environment policy for use of natural resources with establishing the social-oriented market mechanisms, sustainable pastureland use shall be based on the following key provisions:

- Rehabilitation and conservation of pastures as landscape and environment systems ensuring reproduction of biologic diversity and quality of environment;
- Development of market-based relations between the pastureland use and livestock that ensure their economic efficiency and commercialization;
- Increasing employment rate, incomes and welfare of people living in the pastureland areas.

① Fifth National Report on Biodiversity Conservation of the Republic of Uzbekistan.State Committee for Nature Protection/UNDP/GEF.2015



Source: Fifth National Report on Biodiversity Conservation of the Republic of Uzbekistan. State Committee for Nature Protection/UNDP/GEF.2015.

Figure 4-1 Key root causes of pastureland degradation

At the same time, the efficient approach is applying the closed reproduction cycle to pastureland utilization that ensures the expanded (or standard) reproduction of their productivity, prevents pastureland degradation, enables biodiversity rehabilitation, and improves quality of environment.

MFD implements activities aimed at increasing pastureland productivity through establishing pasture protective and fodder-reclamation forest belts that consist of several rows of trees and shrubs. However, despite of selection of tree and shrub species composition and their locations within the forest belts, its structure is formed as dense, open or chilled. The surfaced fertile layer of soil will be prevented from loss due to establishing the pasture protective forest belts; moreover, they enable regulating the level of mineralized underground water, and local people will eventually have a source of firewood.

4.4 Salinization control

In the beginning of the previous century in Uzbekistan, the Aral Sea was the world's the fourth largest internal sea. However, due to incorrect distribution of water resources fed the Aral Sea, it lost up to 90% of its water amount, and fell to small separate lakes. In fact, the Aral Sea is transformed into a desert with the total area of approximate 5 million ha, which is already called as Aralkum, the same manner as Kizilkum and/or Karakum deserts.

The drying of the Aral Sea resulted in shortage of water resources, decreasing quality of drinking water, land degradation, sharp decrease of biodiversity, and problems related to people's health in this region that area very short list of such negative impacts and consequences. Salted water spots have appeared at the exposed bed of the Aral Sea, which particles are transferred to long distances and are spread at wide territories by the winds: it is already known that salt particles from the Aral Sea have been found by the scientists at

alpine glaciers that accelerate their melting. The Aral Sea disaster aggravates desertification and land salinization processes occurred in Uzbekistan.

To combat the above-indicated impacts and consequences, the following approaches are proposed:

- Increasing efficiency of water consumption per unit of area, cultivation of less water intensive plants, growing salt-resistant species, changing use patterns of inefficient lands and rehabilitation of drainage system;
- Development of methodologies and technologies on assessment of level of chemicals and salinization of soils and underground waters, drainage and washing of salinized soils;
- Development of new approaches and adjustment of traditional and standard approaches on land degradation, with the use of populations' capacities.

In Uzbekistan, fixing soils at the exposed bed of the Aral Sea is done through forest planting activities. Annually, forest plantings at the exposed bed of the Aral Sea are undertaken at the area of 15,000-16,000 ha, and total amount of forest plantings implemented by the MFD amounts to 42,000 ha.

The wetland ecosystems available in Uzbekistan till recently were represented by delta, stretched-ended and bow-shaped type lakes. Due to use of the surface runoff for irrigation needs, some lakes in the delta of Amudaria river reduced their size or disappeared but many of them were transformed into the irrigation-discharging lakes. Practically all bow-shaped type lakes disappeared but the stretched-ended lakeswere transferred into the category of irrigation-discharging ones. At the same time, all the lakes belonging to Amudaria delta are considered as potentially instable systems, and have lost their ecosystems and relevant social functions and services for sine die.

Preservation of the social and biosphere values of those lakes is dependent in the majority of cases on potential technical hydro-reclamation and organizational arrangements and decision-making. Depending on their successful implementation, the latter could enable achieving environmental stability of such water objects, and correspondingly conservation of their relevant social values and services that is of the particular importance in the terms of progressing global warming and climate aridization[①].

4.5 Forest fire and disease prevention

In spite of the low level of forest coverage in Uzbekistan, prevention of forest fires is at the highest agenda as this is caused by the nature and climate factors (most of seasons within the year are characterized by hot and dry weather; and restoration of forestlands after wildfire

① Fifth National Report on Biodiversity Conservation of the Republic of Uzbekistan.State Committee for Nature Protection/UNDP/GEF.2015.

requires tens of years and significant funds).

In this regard, the Cabinet of Ministers has issued the Resolution "*Regulations on fire safety in forest of the Republic of Uzbekistan*", #506 of 22.11.1999. According to such resolution, MFD is entrusted with the government control over the enforcement and observation of the Regulations at the territory of the state fund forestlands. Forest preservation from fires is therefore one of the activities to which MFD pays a particular attention. MFD undertakes preventive measures to avoid this natural disaster, and strengthen precautious measures and forest related fire-protective actions.

The so-called fire-preventive corridors and forest belts are established at the forestlands. The targeted workshops and meetings are conducted with participation of representatives from the relevant ministries and agencies, academia, experts and forestry sector decision-makers. During such events, a particular focus is given on strengthening measures aimed at prevention of forest fires and the corresponding timely decision-making. Simultaneously, participants exchange their experience on use of technical tools and equipment to manage the wildfires, and familiarize with work implemented to prevent the forestlands from this natural disaster. However, monitoring of forest fires is not conducted in Uzbekistan①.

Growing wood species in Uzbekistan is facing with some difficulties, as they are very vulnerable to damaging by forest pests and diseases. Forest pests affect the growth of trees and result in their drying and death, and make the wood unfit for construction needs and as casewood.

MFD implements stock-taking and forecasting of potential development of forest pests and diseases, areas of negative impacts of the pollution of industries and utilities, and other affects, and also implements activities aimed at prevention of arising and spreading the forest pestholes and diseases, and increasing biological resilience of forests. In this regard, forest pathological surveys are undertaken, based on which the surface and biological approaches to combat the forest pests and diseases are applied. For instance, to combat the caterpillars of pistachio moth, chemical protection approaches are used, in particular chemicals of wide spectrum such as BI-58 (**phosphamid, phosalone, and benzo phosphate**) that are eligible for use in forestry. Moreover, microbiological medicals such as dendro-bacilin (norm of consumption is 1-3 kg/ha); gamelin (norm of consumption is 1-3 kg/ha), and Delphi docid (norm of consumption is 1-2 kg/ha) are used as well.

Currently, to prevent plant diseases and pests, a particular focus is given to development of environment friendly approaches to plant protection, in particular biological approach. Actually, the peculiarity of development of biological protection of plants is, from one side, expansion of its content due to invention of many new non-chemical approaches to

① 2nd Environmental Performance Review of Uzbekistan, UNECE, 2010

suppression of number of pests, and changing the role and importance of the bio-approaches among the various methods to combat the pests, from the other side.

The extremely useful and efficient tool to combat the pests can become establishing and arrangement of regional networking of the Great Central Asian economies that would join some interested experts and decision-makers. The key tasks of such networking can be awareness raising about forest pests, development of database, exchange with information between various economies, the economy's capacity building activities to combat the forest pests, and providing forestry sector decision-makers with baseline indicators required for well-grounded decision-making.

4.6 Biodiversity conservation

As the agriculture plays an important role in Uzbekistan's economy, the national welfare and sustainable development of the economy significantly depends on availability and shape of natural resources. In this regard, the distinctive peculiarity of the majority of natural ecosystems in Uzbekistan is higher fragility concerned with the climate aridity level. Agricultural activities, outrun livestock breeding, energy and mining sectors development affect the almost all natural ecosystems available in the economy. Moreover, ecosystems are facing the serious anthropogenic pressure, and changing hydrological and climate conditions affect them as well.

The key factors presenting the threats for biodiversity in Uzbekistan are:

- Loss of habitats and degradation of natural ecosystems;
- Reduction of quantity and species (of flora and fauna), including the economically valuable species;
- Erosion/loss of genetic diversity and natural resilience of species (to disease and climate change).

The destroyed ecosystems are not applicable for climate regulating and environment stabilization functions, and have instable and low productivity. Eventually, the value of preserved sites of wild nature and rehabilitated and renewable natural ecosystems will multiply increase.

In this regard, rehabilitation and conservation of biodiversity in Uzbekistan are reasonable and reliable way for ensuring environment stability and sustainable development of the economy as well as adjustment to the current trends and climate change realities.

In Uzbekistan, conservation and sustainable use of biodiversity are one of the key priorities of the national environment policy that are implemented through applying various mechanisms, including:

- National Strategy and Action Plan on Biodiversity Conservation of the Republic of

Uzbekistan, with determination of the key directions and activities related to the biodiversity (Resolution of the Cabinet of Ministers, #139 of 01.04.1998);

- Keeping the national *Red Book*, which includes rare and endangered species of flora and fauna. Currently, 107 species of vertebrates, 77 species of invertebrates, 321 species of higher plants and 3 kinds of mushrooms are included into the *Red Book of Uzbekistan* (2009);
- Ensuring functioning and development of protected areas' system in Uzbekistan. Currently, there are 8 natural reserves, 2 natural parks and 1 national park, 1 biosphere reserve, 3 nature nurseries, 12 gamereserves, and 7 nature monuments. The total area of PAs that ensures sustainable conservation of biodiversity (I-IV categories of IUCN) is over 5% of the economy's territory;
- The government regulating utilization of flora and fauna objects in terms of the use of tools and applying approaches, timelines and amounts of their withdrawal from the nature;
- The government and economic entities performing environment examination and assessment of environmental impacts by projects and by other activities affecting the biodiversity;
- Keeping cadasters of fauna and flora;
- Other mechanisms relevant to the nature protection legislation of Uzbekistan (e.g. economic incentives for sustainable use of nature resources).

In Uzbekistan, the key strategic directions for national planning and development of programmes/projects focused on biodiversity conservation that are in line with the national and international priorities are as follows:

- Maintaining and rehabilitation of ecosystems and their key components in productive landscapes to ensure availability of ecosystem services;
- Integration of actions on biodiversity conservation and sustainable use into wider efforts aimed at reforming the patterns of use of nature resources;
- Assessment with consideration of economic values of biodiversity and ecosystem services;
- Expansion of area and increase of efficiency of PAs system management;
- Raising of awareness of stakeholders and the public about importance of biodiversity and ecosystem services, their inputs into increasing welfare and development of the economy.

In Uzbekistan, biodiversity conservation and its sustainable development are one of the priorities of the national environment policy. To slow the paces of biodiversity losses at national level, it would be required the following:

- Developing legal and regulatory framework and its implementation mechanisms;
- Improving the system's coordination, cooperation, support and incentives;
- Developing biodiversity monitoring system and introducing approaches on its sustainable use;
- Conducting economic assessment of biodiversity and ecosystem services[①].

① Fifth National Report on Biodiversity Conservation of the Republic of Uzbekistan.State Committee for Nature Protection/UNDP/GEF.2015.

4.7 Rehabilitation of degraded forests

The forests in Uzbekistan are the key natural component as well as an integrated part of its biodiversity. Forests are sustainable ecosystems that the best way is to adjust the local soil and climate conditions as well as climate impacts, given that none of anthropogenic impacts affects them. However, the geographic location of Uzbekistan makes the process of desertification, land degradation, and deforestation that level and intensity are determined by the environment and climate conditions. At the same time, the key direct and/or indirect driving forces of the listed process related to forest and landscape degradation are human activities and anthropogenic impacts. In its turn, deforestation and forest degradation in combination with the global warming process are followed, as a rule, by land degradation, which is furthering by desertification.

Resulted from the intensive, very inefficient and extremely voluntary agricultural policy implemented in Uzbekistan in 50-60th of the previous century, a sharp decrease of forestlands occurred in the economy. Thus, due to overregulated runoffs and construction of hydropower facilities, the area of tugai (riparian) forest decreased in more than 10 times. Overgrazing, tree and shrub felling for firewood and construction needs, drainage into the lowlands, and overwatering and excessive irrigation resulted in forest degradation in mountain and desert areas. Drying of the Aral Sea has affected in the most acute and disastrous way the forests and environment in both Uzbekistan and Central Asian region.

The impacts resulted from deforestation and forest degradation, climate change and loss of biodiversity could cause deterioration of social and economic situation. To avoid this, activities aimed at mitigating and/or reducing the negative impacts of those processes to revert deforestation, prevent forest degradation and promote reforestation and forestation are implemented in Uzbekistan.

Improving the shape of existing forests and enlarging their areas through forestation are implemented at the state fund forestlands located in desert, mountain and tugai zones. Saxaul, cherkez and kandim are mainly planted in deserts, three kinds of juniper, walnut, almond and pistachio are grown on mountain areas, poplar, maple, plane-tree, elm, gleditschia, fast-growing and fruit species and introducent species are planted in valley lands, and poplar, willow and oleaster are grown in tugai forests.

The total amount of forestation plantings implemented by the MFD in Uzbekistan is 42,000 ha. Correspondingly, 1% of the economy's territory is covered by forests, namely by the young second growth of the future forestlands. To increase the quality and efficiency of the implemented forest activities, efforts are undertaken to increase production capacity of planting material of the highest quality and wider assortment for reproduction of natural forests and rehabilitation of degraded ecosystems, and establish large-scale plantation of the fast-growing tree species.

4.8 Comprehensive utilization of forest resources and non-timber forest products

The key functions of forests in Uzbekistan that are growing in arid continental climate are protection of river basins, establishment of forest belts against wind and dust, and nature conservation of biodiversity and wildlife. In Uzbekistan, commercial use of forest resources is forbidden due to their limited amount and because of importance of their protective and environmental functions. The main part of wood demand is covered through imported forest products. At the same time, substantial capacity of growing local wood species at suitable plots to meet domestic needs in timber is available in the economy.

In Uzbekistan, forests are a natural object for biological conservation. Forests protect the agricultural and other lands from water and wind erosion. They prevent formation of landslides through transferring runoff into underground waters and fixing the moving sands. In desert areas, soil fertility is increased through establishing the forest belts for pasture protection, soil amelioration and fodder supply. This contributes to improving livestock and cattle breeding.

The non-timber forest products and services such as harvesting of nuts, fruits, berries, mushrooms and herbs are important inputs into livelihood of rural population. The traditional medicine is based on the natural food products and forest plants and herbs.

Forests play an essential role in the global carbon cycle as they accumulate the carbon through carbon sequestration and CO_2 sink, and thus they contribute to reduction of carbon dioxide emission into the atmosphere. The national potential related to carbon sequestration and CO_2 sink is estimated in the range of 2.53 million tons per annum①. It could be an entry point for receiving the carbon credits that would increase financial vitality and attractiveness of forest plantings.

The forests have strong capacities for ecotourism development that is economically valuable and efficient. Currently, the ecotourism programs include visits to mountain villages located in Nurata mountains, Zaamin Natural Park, the Eco-Center “Djeyran”, Tudakul lake, and Low-Amudaria Biosphere Reserve.

After developing and improving environment for environment friendly recreation activities, ecotourism and hunting can be undertaken at forestlands, which are the income-generation opportunities in forestry. Payable forest-related services are a source for such incomes but their efficient rendering requires establishing a mechanism for population’s access to the forests for recreation; health improving, excursions and other activities, including environment-friendly production facilities, i.e. all that will not be prohibited by the law. It

① Fifth National Report on Biodiversity Conservation of the Republic of Uzbekistan.State Committee for Nature Protection/UNDP/GEF.2015

has been estimated that those service and production activities could generate up to US$ 10 billion annually.

Forests provide multiple ecosystem services. Using such services in the right way could be very profitable. However, cost-benefit analysis of ecosystem services is not done, and one of the national priorities for biodiversity conservation and sustainable utilization is therefore development of nationally adjusted approaches to economic assessment of costs and benefits of biodiversity and ecosystem services (including the forest-related ones) to use its results within the future national planning processes.

Chapter 5 Forestry education and research (2010-2015)

5.1 Forestry education
5.2 Technical capacity of forestry authorities
5.3 Capacity building activities within forestry authorities (2010-2015)
5.4 Status of international cooperation, partnerships and networking for forestry
5.5 Training sectors and theme
5.6 Reviews and evaluations of forestry-related initiatives
5.7 The way forward

5.1 Forestry education

The agriculture is one of the key sectors in Uzbekistan. The level of agriculture development is closely linked with food supply of population and supplying inputs for processing industries, and therefore training of professionals for agriculture is of the greatest importance and is a priority.

In Uzbekistan, there are several universities specialized in agricultural sciences. Tashkent State Agrarian University, founded in 1930, is the oldest leading university in Central Asian region, based on the agriculture department of the Central Asia State University. Since its establishment, over 64,000 professionals, including up to 24,000 specialists and bachelors, and over 1,100 masters were graduated from the University. In the past, the University had a Forestry Department that had been eventually joined with other departments. The University Forestry Department has been re-established in 2016, and named as Department on 'Forestry and Herbs', and the first enrollment of students was done for the three specialties:

- Landscape-gardening and greening, with enrollment of 90 students who study the following key disciplines: dendrology, forestation, forest species, forest reclamation, forest taxation, forest regulation, forest selection and seed-growing;
- Landscape-gardening and greening, with enrollment of 40 students who study the following key disciplines: urban greening, landscape construction, vertical greening, landscape-gardening, landscape-gardening nurseries, and dendrology;
- Herbs and environment, with enrollment of 40 students who study the following key disciplines: forest herbs, herb collection and storage, biology, zoology, and herb growing.

The training duration is 4 years for the graduates of bachelor on forestry level. The entrant who has achieved the best marks is allowed for free education. In case of the lower marks, the studies are payable based on the price-list set up as per 01.09.2016. Currently, the admission fee for one academic year is UZS 6,650,000 (US$ 1 = UZS 3,000 as of September 2016).

It is planned to enroll the same number for the same three specialties in 2017 as it was done in 2016. The master-level study is available in the Department; currently there are 5 masters-level students under training who are specialized in forestation and herbs.

There are a number of agriculture colleges in Tashkent, Kashakadarya and Surkhandarya provinces, in which students are trained in forest masters during 3 years. There is also a Training Center under the Ministry of Higher and Vocational Education, where the University's professors and tutors have skills upgrading regular trainings conducted on-the-job basis during 2-month period. The professors of the university deliver the lectures in the Forestry Professional Skills Upgrading Center under MFD.

The two grant-based innovation projects funded by the Scientific and Production Center on Agriculture Researches are implemented by the professors and students of the University. One project is focused on the sea-buckthorn growing but another one on establishing matrix plantations of the promising oleaster (*Elaeagnus*) species.

The University seeks support in its equipping with modern instruments and devices to implement practical training in conducting inventories. There is a lack of networking and cooperation with similar universities and departments available internationally.

Over the past years, over 15 textbooks and training materials were developed and published by the University staff, who have published many scientific and research papers and studies, and several colleagues are in PhD development stage.

5.2 Technical capacity of forestry authorities

To conserve and improve the shape of existing forests, and increase the forestland area, forest regulation work is required as they are at insufficient qualitative and quantitative levels. At the same time, efficient forest protection and technical and funding support of the required capacity building are not provided in the adequate range; moreover, there is a lack of forestry professionals and experts who are able to do the reasonable and well-grounded managerial decision-making at both the central and local levels. To improve operation of the central forestry administration and staff of its regional and local subdivisions, it would be advisable to hire an adequate number of employees with forestry-related specializations through the following arrangements:

- Arranging an open and competitive hiring process based on the relevant criteria that include relevant and proven working experience, professional skills and personal abilities;
- Development and adoption of the standard contracts for all-level forestry employees and staff;
- Creation of unified database of all forestry employees;
- Development of unified capacity building strategy for forestry sector.

Many of the MFD staff are not sufficiently aware of advanced approaches, and do not have an access to new knowledge. Best practices have successfully been applied in forestry sector. One of the ways to address these gaps is further capacity building of the core forestry staff in Uzbekistan.

5.3 Capacity building activities within forestry authorities (2010-2015)

Currently, over 7,000 employees, including up to 300 decision-makers and over 1,100 engineers and technicians are working in MFD. To monitor their professional compliance with the applied performance requirements and professional development progress, they have to

pass the professional examination in three years in the Central Office of the MFD. All forestry professionals and staff such as directors of forest farms, principal foresters, accountants, forest engineers, etc. shall pass such examination (without any exceptions). The latest examination was conducted in 2015.

To develop professional skills of the forestry staff, their familiarization with best practices and advanced approaches related to forestry sector and various directions of forestry sector activities, the Forestry Professional Skills Upgrading Center is functioning under MFD. The training sessions are delivered by the leading professionals of the MFD, and specialists from the nature protection and environment agencies, and from the Agrarian University. However, the trainees study the disciplines in the majority of cases theoretically only as there is a lack and/or shortage of training aids and technical tools/instruments to conduct the practical training.

5.4 Status of international cooperation, partnerships and networking for forestry

Over the past years, the following key capacity building events have been held in the economy:

- Workshop on the Development of the Forest Financing Strategy (FAO) held in Uzbekistan on November 4, 2011 (http://www.fao.org/forestry/nfp-facility/68438/fr/);
- Locust Geographic Information System Workshop and Technical Workshop on Locusts in Caucasus and Central Asia (FAO) held in Uzbekistan on November 4-14, 2013 (http://www.fao.org/ag/locusts-CCA/en/1011/1124/1176/index.html);
- Workshop within the Sustainable Forest Management for Greener Economies in the Caucasus and Central Asia Initiative (UNECE) held in Uzbekistan on October 21-23, 2014 (https://www.unece.org/forests/capacitybuilding.html);
- Workshop on improving Sustainable Forest Management (FLERMONICA) held in Uzbekistan on August 19-20, 2015 (http://www.naturalresources-centralasia. org/flermoneca/assets/files/Report%20on%20FLEG%20_Uz_%2019-20%20August%202015,%20Uzbekistan%20_%20EN. pdf);
- Initial Workshop on “Development of models for joint forestry management to establish sea-buckthorn plantations at the state fund forestlands in Uzbekistan” held in Uzbekistan in April 2016 in cooperation with the regional programme on sustainable use of natural resources in Central Asia of the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH (http://www.review.uz/index.php/novosti-main/item/8001-v-uzbekistane-startoval-novyj-proekt-po-upravleniyu-lesnym-khozyajstvom);
- The first regional inception workshop on “Accountability Systems for Sustainable Forest Management in the Caucasus and Central Asia” on November 15-18, 2016.

Cooperation with the United Nations Food and Agriculture Organization (FAO) has been started in October 2001. The institutional cooperation is implemented by the designated

national agency – MAWR, which coordinates the cooperation with FAO.

The representatives of MAWR regularly attend the events organized by FAO aimed at capacity building focused on increasing agriculture productivity and efficiency, preventing transboundary animal diseases, development of forestry and fishery sectors.

The Uzbek-Korean friendship forest was opened in Karmana district of Navoi region in November 2015(http://uza.uz/en/business/friendship-forest-opens-in-navoi-region-11-11-2015).

Opening of the forest has also been a demonstration of frank and amicable relations between the two economies. With the assistance of the Korea International Cooperation Agency (KOICA), the Project for Greenery of the 140 ha territory attached to Navoi FIEZ (US$ 2.5 million) has been underway. Around US$ 725,000 are allocated from the state budget for greening of this area as well. Moreover, a greenhouse in 1 ha has been established under the South Korean standards within the project, all communications systems are ready for operation.

The Northwest Agriculture and Forestry University of China and Uzbekistan signed a cooperation agreement (http://www.bestchinanews.com/Domestic/1034.html) in July 2016.

The Vice President Wu Pute, with a delegation of six, was invited to visit Uzbekistan and the capital city of Tashkent, including the International Center for Agricultural Research in the Arid (ICARDA), the International Water Management Institute (IWMI), the Center of Biodiversity International (Biodiversity International), Tashkent Institute of Irrigation and Soil Improvement (TIIM) to carry out all-round cooperation mechanism and mode of the deep “Belt and Road Initiative” background including a number of international agricultural research institutions and local agricultural research institutes under the University and Central Asia, and signed a memorandum of cooperation with some institutions.

5.5 Training sectors and theme

To strengthen professional capacities of forestry employees and staff, the Forestry Professional Skills Upgrading Center is functioning under MFD. It delivers the specialized trainings and workshops tailored for various targeted audiences (forest wardens, forest rangers, economists, accountants, etc.). During these training events, the participants familiarize with new technical aspects of their specializations. Practically, 100% of the MFD employees and staff have one-week mandatory trainings in the Center.

The capacity building activities include those conducted by the international organizations. Within various workshops and trainings, forestry staff and employees, representatives of nature protection agencies, NGOs and others learn the forestry innovation funding tools,

approaches to mobilization of funding from internal and external sources, and optimized utilization of the mobilized funds. Participants of such events have got data and information about the potential inputs of forestry sector into greening national economy process and ways on how to overcome the existing barriers to achieve this, approaches to the SFM, combating forest pests, diseases, and desertification, and integrated assessment of forestlands.

Thus, Locust Geographic Information System Workshop and Technical Workshop on Locusts in Caucasus and Central Asia (FAO) held in Uzbekistan on November 4-14, 2013 were focused on the following subjects:

- GIS, remote sensing and other technologies for locust information collection and management; and ASDC examples of remote sensing application to locust monitoring in Caucasus and Central Asia (CCA);
- GIS and other output products and methods of regional forecasts;
- Experience sharing by countries using GIS for pest monitoring;
- Automated System of Data Collection (ASDC) as well as related software and hardware;
- Access to and management of collected locust-related data.

The Workshop within the Sustainable Forest Management for Greener Economies in the Caucasus and Central Asia initiative (UNECE) held in Uzbekistan on October 21-23, 2014 was focused on increasing the potential of the forest sector in “greening” economy in the Caucasus and Central Asian region, in particular:

- Forest-policy formulation;
- Bioenergy generation from wood;
- Data collection on forests and forests products.

The Workshop on Improving Sustainable Forest Management (FLERMONICA) held in Uzbekistan on August 19-20, 2015 has shared the experience of Germany and discussedthe issues on forest management planning, inventory and capacity building on management planning, afforestation programmes and inventory implementation in forest with the representatives from the regional affiliated bodies of the MFD.

The Initial Workshop on “Development of models for joint forestry management to establish sea-buckthorn plantations at the state fund forestlands in Uzbekistan” held in Uzbekistan in April 2016 was aimed at enabling implementation of the government Programme on development of herb growing. The proposed model includes establishing plantations of sea-buckthorn and dog-rose in Uzbekistan. The key objective of the workshop was development and testing of the model of joint forestry management at pilot sites located at the state fund forestlands. This would result in supplying the national pharmaceutical industries with the required inputs but local people would enjoy with increasing their incomes generated from the alternative sources, e.g. through production of valuable oil with using the berries of these scrub species.

5.6 Reviews and evaluations of forestry-related initiatives

Though the Forestry Professional Skills Upgrading Center under MFD is responsible for and delivers capacity building activities, it lacks capacities required for conducting regular evaluations and assessments of its training activities. There is no any information system and/or database in place on both national and international capacity building events and initiatives conducted in Uzbekistan as well as tools for collecting participants' feedback and proposals, and experts who can do the corresponding training needs assessment and knowledge gap analysis to develop new training modules.

5.7 The way forward

Within the development of the Concept on Forestry Development in Uzbekistan up to 2030, the key future forestry-related initiatives have been identified and proposed for forestry staff and employees to improve their managerial and technical skills, in particular:

- Strengthening applied training for the forestry staff, with particular attention for increasing interest and experiences for more collaborative forestry implementations and for improving managerial and technical skills;
- Revision and development of the training programs and materials, improvement of the means and facilities of the Training Center of the MFD as well as collaboration with the other relevant institutions for these purposes;
- Taking joint initiatives for strengthening capacities of the forestry education and research institutions as well as the dialogue and collaboration between the forestry organizations and education-research institutions.

Chapter 6 Forestry projects and initiatives

Currently, the following on-going and/or hard pipeline forestry projects/initiatives are available in Uzbekistan.

The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) Project "Development of models of joint forest management for establishing buckthorn plantations at the state forest stock lands in Uzbekistan". It will enable implementation of the programme on development of medical herbs of the Government of Uzbekistan. The key objective of theproject is development of a model of joint forest management and its testing at the pilot sites of the state fund forestlands.

Project "Forest and Biodiversity Governance Including Environmental Monitoring" (FLERMONECA) is being implemented by GIZ, the German Forestry Agency Hessen-Forest, Austrian Environment Agency (UBA) and Regional Environmental Centre for Central Asia (CAREC) in all five Central Asian economies. The objective of the project is supporting application of legal and sustainable approaches to forestry management, and solving problems in forestry sector to improve living standards of local population.

UNDP/GEF Project "Reducing Pressures on Natural Resources from Competing Land Use in Non-Irrigated Arid Mountain, Semi-Desert and Desert Landscapes of Uzbekistan". The project will promote the integrated management of rangeland and forests at a landscape level (focusing on non-irrigated, arid mountain, semi-desert, and desert landscapes) to reduce pressures on natural resources from competing land uses and to improve the socio-economic stability of communities.

UNDP/GEF Full-sized Project "Sustainable Natural Resource and Forest Management in Key Mountainous Areas Important for Globally Significant Biodiversity". The objective of the project is demonstration of viability of landscape approach to conservation of internationally important biodiversity, land and forest resources in Uzbekistan's mountain ecosystems in harmony with sustainable development of local communities.

GEF Small Grant Program (SGP) in Uzbekistan. One of the focal areas of the programme is introducing principles of the SFM, participatory forestry and local measures to achieve global environmental benefits.

UNECE-FAO Project "Accountability Systems for Sustainable Forest Management in the Caucasus and Central Asia". The project is expected to contribute to the sustainable development of the sector towards a green economy.

FAO Regional Project "Capacity Building for Sustainable Management of Mountain Watersheds in Central Asia and the Caucasus". The objective of the project is to support national capacity building on integrated and participatory watershed management.

GEF-FAO Project “Sustainable Forest Management in Mountain and Valley areas in Uzbekistan”. The objective of the project is introduction of the SFM in Uzbekistan, thereby sequestrating carbon and improving the quality of forest and tree resources.

FAO Project “Integrated Forest Land and Tree Resources Assessment”. The objective of the project is development of forestry for sustainable management of natural resources and increased income-generating opportunities for rural population.

FAO-Michael Succow Foundation “Central Asian Desert Initiative”. The Initiative is aimed at protection of the ecosystem, improvement of nature conservation, and feeding lessons learned into national, regional and international dialogue.

GIZ-Michael Succow Foundation Project “Ecosystem based land and forest management of the tugai habitats of Amudarya River for improved livelihood of local communities and as adaptation strategy to climate change”. The project addresses a sustainable, climate-adopted and site-adapted management of natural resources along the Amudarya, thereby improving the livelihoods of the people in the target region and the environmental capacity of the floodplain natural space.

FAO-GEF-ICBA-ICARDA-CAREC multi-donor, multi-country framework “CACILM 2” (Central Asian Countries Initiative for Land Management) which includes a five-year program of activities implemented in the Central Asian region. In Uzbekistan, this Regional Initiative focuses on Uzbekistan’s desert forests.

The Korea International Cooperation Agency (KOICA) Project for Greenery of the Territory Attached to Navoi Free Industrial Economic Zone for prevention of desertification. The objectives of the project include the improvement of the ecological environment and living conditions of the local population around this Zone.

Implementation of a number of projects focused on establishing protective forest belts at the exposed bed of the Aral Sea is planned with funding by the Islamic Development Bank, Saudi Development Fund and Kuwait Fund for Arabic Economic Development.

Two projects on reforestation and afforestation are planned for joint implementation with the Turkish International Cooperation Agency (TIKA). One project will be focused on natural reproduction of tugai forests of coastal areas of Amudaria river delta but another one will be aimed at establishing forest nursery facilities for breeding desert species growing in the Aral Sea region to be located in Bukhara, Navoi and Khoresm provinces and in the Republic of Karakalpakstan.

The International Fund for Aral Saving (IFAS) in cooperation with UNECE will implement a project on reforestation and afforestation in the Aral Sea basin.

The brief information about the forestry-related projects and initiatives is summarized in the Table 6-1 below.

Table 6-1 Forestry-related projects and initiatives in Uzbekistan

Name of the initiative/ organization	Working priorities	Major experience
GIZ "Programme for the sustainable use of natural resources in Central Asia"	Reforms in the economy, health and education, and the protection of natural resources. Sustainable economic development and health are priority areas	Development and dissemination of local approaches with particular focus on adaptation-based ecosystem approach. Afforestation of desert forests and prevention of forestland degradation; Forest resources management in an economically viable, socially acceptable and ecologically sustainable way. Capacity building activities with particular focus on forest-related stakeholders; Since 2002, GIZ has implemented a number of forest-related activities in Uzbekistan
FLERMONECA is one of the four key components of regional environment programme of European Union for Central Asia (EURECA 2009)	Ensuring observation of forest legislation and implementation of forest management in Central Asia (FLEG in Central Asia); environment rehabilitation and biodiversity conservation in Central Asia (ERCA); and monitoring of environment situation in Central Asia	Enabling legal and sustainable forest management and utilization; solving problems related to illegal forest utilization and development of local income generation sources, including relevant capacity building activities. Since 2009, it has been implemented in Uzbek forestry
UNDP	Collaboration with national and international partners to strengthen environmental governance, to build institutional and individual capacities to mitigate anticipated climate change impacts, to mainstream biodiversity conservation principles into sectoral policies and programmes and to promote renewable energy and sustainable use of land and water resources. Through capacity building and piloting initiatives, UNDP has contributed to the attainment of the Millennium Development Goal 7 and corresponding national MDG targets	Solving problems related to land degradation and improving management of protected areas; Conservation and restoration of tugai forest ecosystems; Promotion of the integrated management of forests at a landscape level with improvement of the socio-economic stability of local communities; Conservation of international forest resources in mountain ecosystems in harmony with sustainable development of local communities. Since 2004, UNDP has implemented a number of forest-related activities in Uzbekistan
GEF SGP	Promotion of the improvement of the global natural environment via the implementation, by means of local people, of local initiatives designated to preserve and restore the environment by implementing and replicating sustainable natural resources management practices that improve people's livelihoods	The planting of pistachios, a crop that does not require any water and can serve as a means to prevent land degradation; Since 2009, GEF SGP has worked in Uzbek forestry sector

(Continued)

Name of the initiative/ organization	Working priorities	Major experience
FAO	Co-operation through national as well as regional projects, technical assistance, sustainable natural resources management and organic agricultural production	Development of forest policy; Development and implementation of a National Strategy to Support the Non-Wood Forest Products; Support for obtaining adequate and reliable information about extent and state of the existing forest resources and changes over time. Sustainable forest management and capacity building and policy advice activities; In Uzbek forestry, it has been operated since 2001
UNECE	Sustainable forestry management and capacity building of the forest sector	Through training and rendering policy advisory services to assist Uzbekistan in developing context specific strategies to more fully harness of the potential of the SFM for greener economy; In Uzbek forestry, it has been operated since 2013
Michael Succow Foundation	Development and protection of national parks and biosphere reserves in the transformational countries of the former Eastern block	Mid-range transfer of existing strictly protected nature reserves into international protection categories through the creation of buffer zones, development of eco-tourism and creation of new sources of income for the local population. Since 2010, it has implemented the activities focused on Uzbek forestry
CACILM 2	Combating desertification and land degradation while also improving rural livelihoods across the Central Asian region	Minimizing pressures and negative impacts on natural resources; It has been operated in Uzbekistan since 2013
KOICA	Addressing global development issues and facilitating the sustainable socio-economic development to improve the quality of life in developing countries.	Forestation activities in Uzbekistan since 2015
TIKA	Activities in the fields of education, health, restoration, agricultural development, finance, tourism, and industry	Forestation, afforestation, establishing forest nurseries, exchange with best practices and experience, and technical assistance since 2006
IFAS	Financing and crediting joint practical action and perspective programs and projects on saving the Aral Sea, ecological rehabilitation of the Aral Sea region and the Aral Sea Basin as well as solving common social and economic problems in the Central Asian region	Establishing protective forest plantings at the exposed bed of the Aral Sea. It has been operated in Uzbekistan since 1997
APF Net	Promoting the SFM and rehabilitation, and being in the process of bringing socio-economic benefits of forests to communities	Forest policy dialogues, capacity building, and information sharing. Since 2014, it has implemented the activities focused on Uzbek forestry

Chapter 7 International forestry cooperation mechanisms

Uzbekistan is the Party to a number of international environment conventions, and the economy fulfills the corresponding reporting commitments and obligations (as of 2016):

The Third National Communication of Uzbekistan to UNFCCC is at its finalization stage. The Second National Communication was developed and posted in 2008.

Report on the information about refrigerants imported into the economy and the data on their ozone depleting potential required in accordance with Article 7 on Substances that Deplete the Ozone Layer of Montreal Protocol is submitted annually.

The Fifth National Report on Conse**rvation** of **Biodiversity** has been developed, submitted to UNCBD and posted in 2015.

New National Programme to Combat Desertification in Uzbekistan is under development. The previous National Programme to Combat Desertification was developed and posted at UNCCD in 1999.

The Biennial Report of the Republic of Uzbekistan (2013-2014) has been developed, submitted to the Convention on International Trade on Endangered Species of Wild Flora and Fauna (CITES), and posted in 2014. The previous biennial report was posted in 2011.

The reports to the Convention on the Conservation of Migratory Species of Wild Animals during 2010-2016 were as follows:

- National Report from Uzbekistan on Siberian Crane (2010);
- National Report from Uzbekistan on Saiga Antelope (2010);
- National Report on CMS (2011);
- National Report from Uzbekistan on Bukhara Deer (2011);
- National Report from Uzbekistan on CMS and Saiga Antelope (2015).

Uzbekistan currently has two sites designated as Wetlands of International Importance (Ramsar Sites), namely Aydar-Arnasay Lakes system and Lake Dengizkul, with a surface area of 558,400 ha. The National Report on the Implementation of the Ramsar Convention on Wetlands was developed, submitted to the Convention and posted in 2008.

Uzbekistan's forestry participates in United Nations Forum on Forests (UNFF), and Uzbekistan is a member of the FAO Committee on Forestry (COFO) while the Uzbek foresters also participate in the Intergovernmental Forum on Forests (IFF) and Intergovernmental Panel on Forests (IPF).

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