BESNet
Biodiversity and Ecosystem Services Network

BES-Net Central Asia Regional Trialogue on Land Degradation, Biodiversity and Climate Change

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Almaty, Kazakhstan

BACKGROUND DOCUMENT

UNDP
Empowered lives.
Resilient nations.

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for the Environment, Nature Conservation
and Nuclear Safety

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Resilient nations.

GC-RED
Resilient Ecosystems and Desertification

The United Nations Development Programme works in about 170 countries and territories, helping to achieve the eradication of poverty and the reduction of inequalities and exclusion. We help countries to develop policies, leadership skills, partnering abilities, institutional capabilities and build resilience in order to sustain development results. The Nairobi-based Global Policy Centre on Resilient Ecosystems and Desertification (GC-RED) is one of UNDP's Global Policy Centres. GC-RED is responsible for advancing global thinking and knowledge sharing on inclusive and sustainable development in drylands and other fragile ecosystems.

BESNet
Biodiversity and Ecosystem Services Network

The Biodiversity and Ecosystem Services Network (BES-Net) is a capacity sharing "network of networks" that promotes dialogue between science, policy and practice for more effective management of biodiversity and ecosystems, contributing to long term human well-being and sustainable development. The Network uses a three-pillar approach: face-to-face capacity building activities (the BES-Net Trialogues), National Ecosystem Assessments and an online platform for networking– with all components mutually reinforcing. BES-Net is hosted by UNDP GC-RED.

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Key Messages

Why land degradation matters

- Land plays a crucial role in the national economies of the Central Asian countries. Agriculture's estimated contribution to the Gross Domestic Products (GDPs) of the Central Asian countries ranges from about 5% to 30%, namely 6% in Azerbaijan, 5% in Kazakhstan, 12% in Kyrgyzstan, 19% in Tajikistan, 11 % in Turkmenistan and 32% in Uzbekistan (as of 2018).
- Land forms the basis for biodiversity and provides a variety of ecosystem services, such as pollination, the regulation of climate, air and freshwater quality, soil formation and the provision of food, timber and energy. The total value of ecosystem goods and services provided by land is estimated to be around US$ 800 billion, which is 5 times more than the combined conventional GDP of the Central Asian countries.[1]
- Globally, land degradation is affecting a wide variety of ecosystems such as forests, rangelands, wetlands, drylands and steppes. The main agro-ecological zones in Central Asia susceptible to land degradation are irrigated lands, rain-fed areas, rangelands and mountainous areas. According to various estimates, the extent of land degradation in Central Asian countries ranges from 8% to 60%. Between 2001 and 2009, the cost of land degradation for the Central Asian countries equaled US$ 5.85 billion including rangeland degradation (US$ 4.6 billion), desertification (US$ 0.8 billion), deforestation (US$ 0.3 billion) and abandonment of croplands (US$ 0.1 billion).[2]
- Globally, the well-being of around 1.5 billion people is directly affected by land degradation. Low-income and rural communities (e.g. 74% of the poor, 42% of the very poor and 32% of the moderately poor) are more severely affected by land degradation. In Central Asia, more than half of population resides in rural areas. Agriculture provides jobs for about 35% of people in Azerbaijan, 20% in Kazakhstan, 30% in Kyrgyzstan, 55% in Tajikistan, 20% in Turkmenistan and 30% in Uzbekistan.[3] Land degradation in the region is likely to adversely affect the livelihoods and wellbeing of these people.
- Land degradation may reduce livelihood opportunities, has negative effects on local peoples' health and exacerbates involuntary migration. Involuntary migration forces local people to abandon their ancestral lands that form a pillar of local identities. For example, land degradation around the Aral Sea led to outmigration of 250,000 people (20% of regions entire population) from the Qaraqalpaqstan autonomous region of Uzbekistan.[4]
- There are a number of direct and indirect drivers of land degradation. The main drivers of land degradation in Central Asia are: unsustainable agricultural practices, expansion of crop production to fragile and marginal areas, inadequate maintenance of irrigation and drainage networks, overgrazing on pastures as well as land conversion, urbanization and extractive industries. Each of these drivers has a number of underlying and intricately linked set of drivers. Timely action to avoid, reduce and reverse land degradation makes sound economic sense, resulting in, inter-alia, increased food and water security, increased employment, improved gender equality, a substantial contribution to the adaptation and mitigation of climate change and avoidance of conflict and migration.

1 These estimates do not include data from Azerbaijan (Mirzabaev et al. 2016).
2 These estimates do not include data from Azerbaijan (Mirzabaev et al. 2016).
3 FAO, 2017.
4 ADB, 2012.

- Worldwide commitment to protect land resources is strongly reflected in Sustainable Development Goal (SDG) 15.3 which aims at achieving Land Degradation Neutrality (LDN) and showcases an important international initiative to combat land degradation (Figure 1; Box 1). As of September 2019, 122 countries have committed to setting voluntary LDN targets, more than 80 have already set national LDN targets including Azerbaijan, Kazakhstan, Kyrgyzstan and Uzbekistan from the Central Asian region.

- Central Asia is one of the regions, which will be most adversely affected by climate change.[5] Climate change is likely to exacerbate adverse effects of land degradation. Many climate change scenarios predict increasing water shortages, greater unpredictability and magnitude of extreme weather events as well as alteration of precipitation amounts and patterns in Central Asian region.[6]

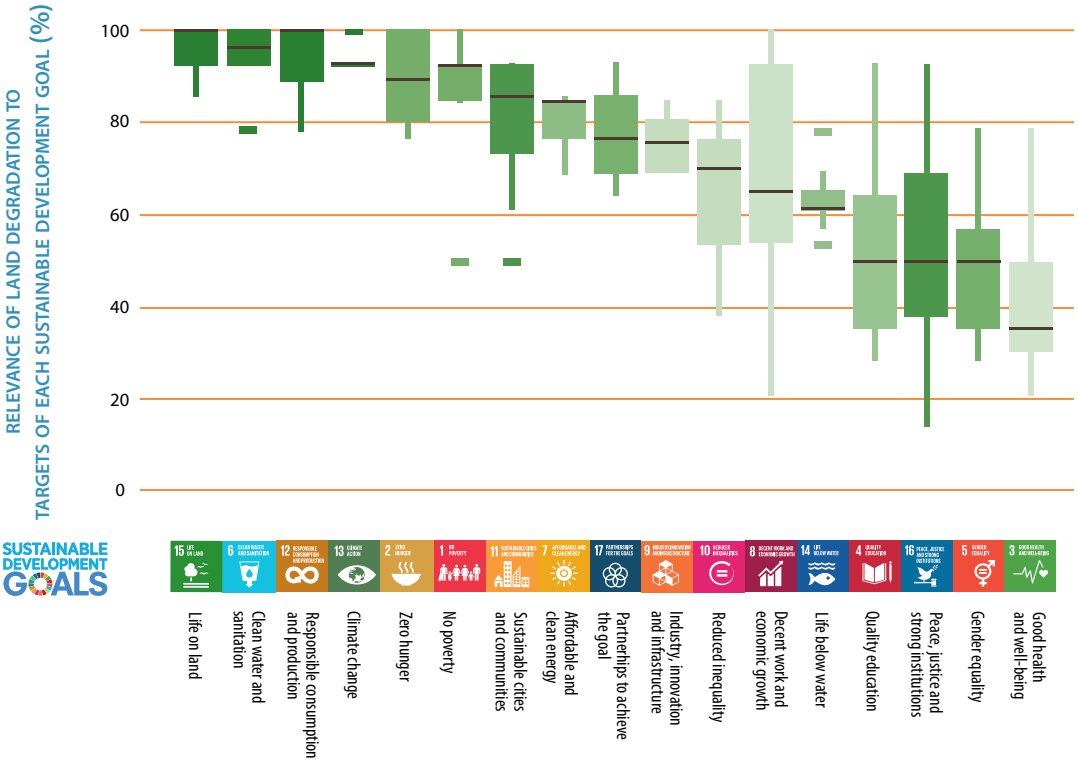
BOX 1: WHAT IS LAND DEGRADATION NEUTRALITY?

Land Degradation Neutrality, or LDN in short, is a state whereby the amount and quality of land resources, necessary to support ecosystem functions and services and enhance food security, remains stable or increases within specified temporal and spatial scales and ecosystems. It focuses on conserving, sustainably managing and restoring land in the context of land use planning and aims at counterbalancing the expected loss of productive land with the recovery of degraded areas.

UNCCD, URL: https://www.unccd.int/actions/achieving-land-degradation-neutrality

FIGURE 1: Relevance of land degradation to targets of each SDG

Land degradation affects all Sustainable Development Goals, but some more than others. It particularly affects the ecosystems underpinning much of the society's benefits and it also affects food security (for example through reduced productivity of agricultural land, reducing pollinators and affecting water resources). Source: IPBES Land Degradation and Restoration Report (IPBES 2018).



5 IPCC, 2007; GTZ, 2007

6 Reyer et al., 2017.

Why pollinators matter

- Pollination is a fundamental ecosystem process necessary for most flowering plants to bear fruit and produce seeds.
- Animal pollinators are diverse and include more than 20,000 species of bees, some flies, butterflies, moths, wasps, beetles and thrips, as well as birds, bats and, more rarely, other vertebrates. Some species of bees are used for livelihoods, including the European honeybee (*Apis mellifera*), the Asian honeybee (*Apis cerana*) and some bumblebees (*Bombus spp.*). Central Asia is the home of a new subspecies (*Apis mellifera pomonella*) of the European honeybee.
- The Food and Agriculture Organization of the United Nations (FAO) has declared pollination services an "agricultural input" that ensure the production of crops. Globally, pollinator-dependent crops contribute to 35% of global crop production by volume. About 14% of total agricultural crop output in Central Asia is dependent on pollination services[7], such as apples, pears, apricots, melons, watermelons, etc.
- Equally, the healthy nutrition of local communities relies on pollinator-dependent crops such as apples, pears, apricots, peaches, cherries, plums, melons, watermelons, and almonds.
- Pollinators provide multiple benefits beyond food production and their value has an important cultural and social component. Many livelihoods and cultural practices depend on pollinators, their products and multiple benefits such as medicine, fibres, materials for musical instruments, source of inspirations for arts, literature to name a few.

7 Galai et al. (2009) analyzed the 100 crops used directly for human food worldwide as listed by FAO and estimated that for Central Asia total crop production value was 11.8 billion. Crops dependent on insect pollination (mostly vegetables, fruits and edible oil crops) amounted for 1.7 billion.

What are the challenges of land degradation and pollinators in Central Asia?

- Causes of land degradation are complex and linked to an array of other socio-economic and environmental issues. Land degradation affects biodiversity conservation, human health and wellbeing and food security. In Central Asia, land degradation cannot be understood without taking into account the links between water, energy, food and ecosystems, often referred to as "water-energy-food security nexus".

- Land degradation is not a new challenge for the region. The Central Asian region has a history of meeting other goals and priorities such as grain and cotton self-sufficiency, production plans and targets, etc. at the expense of worsening land degradation.

- The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services' (IPBES) Thematic Assessment Report on Pollinators, Pollination and Food Production identified Central Asia as one of the top-three areas most vulnerable to pollination service loss (p. 419).

- The IPBES assessment on pollinators, pollination and food production reported a well-documented decline in some species of wild pollinators, although data on the status of most wild species and from many regions including Central Asia is lacking.

- Land degradation and pollinator decline are interlinked. Unsustainable intensification of agriculture is a driver of both land degradation and pollinator decline. Pollinators are essential for increasing productivity of some crops, thus providing an environmentally-friendly way to boost productivity. However, expansion of intensive agriculture increases demand for pollination services and simultaneously generates growing pressures on pollinators.[8]

- Risks to pollinators, in addition to land use and intensive agricultural management, also include pesticides and specific inputs (insecticides and herbicides) associated with Genetically Modified (GM) crops. Diseases, pests, predators and invasive alien species are key threats.

- Central Asia is expected to be one of the most severely affected regions by climate change.[9] The effects of the climate change will further amplify drivers of land degradation and pollinator decline and make development of reactive and proactive measures more challenging.

- While land degradation is a generally well-represented in public discourse, pollination and pollinators are not widely discussed or targeted by local, national or regional policies and strategies in the Central Asia region.

- Tackling the issues of land degradation, pollination and climate change requires joint effort of and building partnership between various stakeholders. Regional programs, action plans and strategies should take into account local knowledge, values and practices and be well aware of institutional set-up, mechanisms and processes.

8 Bommarco et al., 2013.
9 IPCC 2007.

Introduction

This document aims to provide background material for the BES-Net Regional Trialogue for Central Asia: Bright Spots for Land Degradation Neutrality, Pollinators and Climate Change to be held in Almaty, Kazakhstan, in October 2019.

The BES-Net Trialogues are multi-stakeholder dialogues among the three communities of policy, science and practice that focus on specific policy questions at the national and regional levels. This Trialogue, seeking to engage six Central Asian countries, namely Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan, will bring together a diverse set of stakeholders in dialogue around the two IPBES global thematic assessment reports – namely 1) Thematic Assessment Report on Pollinators, Pollination and Food Production; and 2) Thematic Assessment Report on Land Degradation and Restoration. The Trialogue will explore ways to integrate the key messages from the two assessments, emphasize the connections between the themes and highlight their relevance for achieving the land degradation related agendas in the Central Asian region, including LDN. The Trialogue will also take into account the findings and recommendations of the IPBES Regional Assessment Report on Biodiversity and Ecosystem Services for Europe and Central Asia as well as IPBES Global Assessment on Biodiversity and Ecosystem Services. The Trialogue will also consider the recently published Intergovernmental Panel on Climate Change (IPCC) Special Report on Climate Change and Land.

IPBES is the intergovernmental body which assesses the state of biodiversity and of the ecosystem services it provides to society, in response to requests from decision makers. Some Central Asian countries are already IPBES members, while other countries have initiated the process to become members (Table 1). The United Nations Convention to Combat Desertification (UNCCD) is a legally binding international agreement linking environment and development to sustainable land management. All Central Asian countries are signatories to the UNCCD. The goal of achieving LDN is reflected in the UNCCD's 2018-2030 Strategic Framework and SDG 15.3.

TABLE 1: Central Asian countries: IPBES membership and national LDN Targets

Country	IPBES membership	National LDN targets
Azerbaijan	Yes	Yes
Kazakhstan	No	Yes
Kyrgyzstan	Yes	Yes
Tajikistan	Yes	No
Turkmenistan	No	No
Uzbekistan	No	Yes

10 See Annex 1.
11 Le et al., 2014.

What Do We Know about Land Degradation in Central Asia?

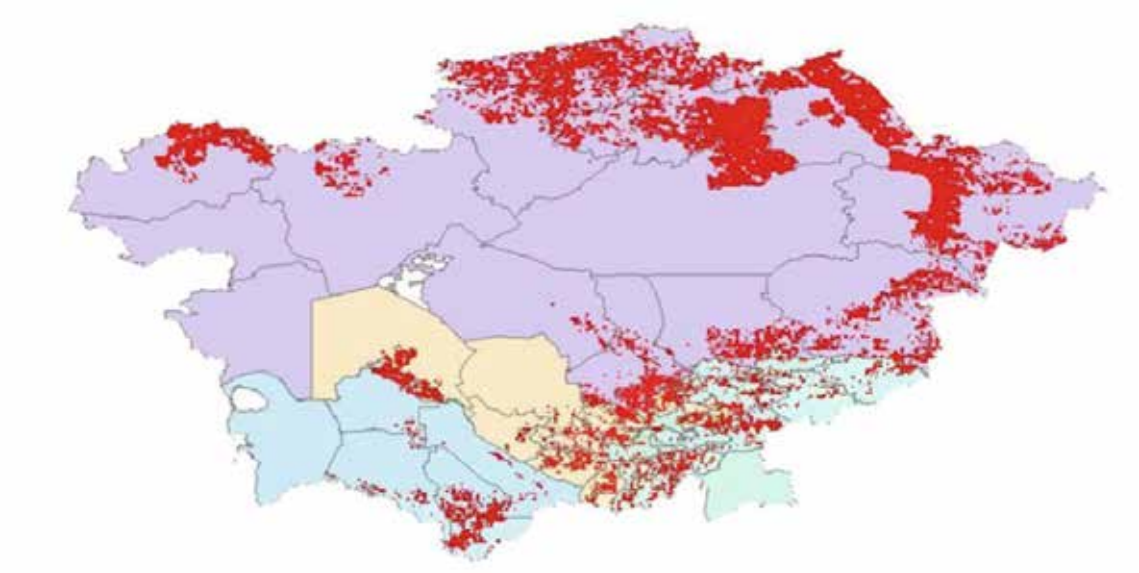
According to various estimates, the extent of land degradation in Central Asian countries ranges from 8% to 60% (Figure 2). Main agro-ecological zones in Central Asia susceptible to land degradation are irrigated lands, rain-fed areas, rangelands and mountainous areas. For example, up to 40-60% of irrigated lands in the region are affected by secondary soil salinization and waterlogging.[12] An estimated 14 million ha of grasslands have degraded into shrublands and barren lands[13] with strongest rangeland degradation near settlements.[14]

Desiccation of the Aral Sea, one of the most well-known cases of land degradation in Central Asia, resulted in frequent dust storms contaminated by fertilizers, pesticides, heavy metals, and other chemicals, which negatively impacted populations' health[15], agricultural productivity, economic development in the area and livelihoods of more than 35 million people.[16]

Between 2001 and 2009, the cost of land degradation for the Central Asian countries equaled US$ 6 billion[17] including rangeland degradation (US$ 4.6 billion), desertification (US$ 0.8 billion), deforestation (US$ 0.3 billion) and abandonment of croplands (US$ 0.1 billion). At the same time, land improvement through land use change in the region amounts to US$ 13 billion mostly due to transition of abandoned croplands to grasslands in Kazakhstan.[18] The cost of action against land degradation over a 30-year horizon was found to be US$ 53 billion, while cost of inaction topped US$ 288 billion. Thus, action to combat land degradation in Central Asia will cost 5 times less than inaction.[19]

FIGURE 2: Land degradation hotspots in Central Asia (in red)

Source: Mirzabaev 2016 with a reference to Le et al. (2014).



12 Qadir et al., 2009; Qi et al., 2012.
13 Mirzabaev et al., 2016
14 Robinson, 2016.
15 Jensen et al., 1997; Wiggs et al., 2003.
16 Cai et al., 2003; Lioubimtseva, 2015
17 These estimates do not include data from Azerbaijan (Mirzabaev et al. 2016).
18 Mirzabaev et al. 2016.
19 Mirzabaev et al. 2016.

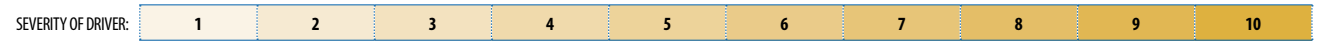
Drivers of Land Degradation in Central Asia

The main drivers of land degradation in Central Asia are soil salinization for irrigated areas, water and wind erosion for rain-fed and mountainous areas as well as overgrazing of rangelands. These drivers also have a set of underlying drivers, which are complex and interlinked (Table 2). Most of the drivers are not new to the region and have their own historical roots. For example, monoculture systems as well as inefficient irrigation systems (with almost half of the irrigation water not reaching the fields have been reported to contribute to land degradation.

TABLE 2: Drivers of land degradation in Central Asia*

Ecosystem Type	Drivers	% of land affected by particular driver					
		Azerbaijan	Kazakhstan	Kyrgyzstan	Tajikistan	Turkmenistan	Uzbekistan
Irrigated lands (Salinization and sodification)	Excessive irrigation	N/A	30%	10%	10%	20%	30%
	Poor drainage and irrigation system	N/A	30%	10%	10%	20%	30%
	Irrigation water is contaminated by drainage and discharge water upstream	N/A	40%	5%	5%	20%	30%
	Leaching, excessive use of fertilizers	N/A	30%	5%	5%	20%	30%
	Governmental subsidies for irrigation	N/A	30%	10%	10%	20%	30%
	Land tenure insecurity	N/A	30%	10%	10%	20%	30%
	Low access to credit markets	N/A	30%	10%	10%	20%	30%
Mountainous areas	Poverty	N/A	10%	50%	60/8	30%	30%
	Low market access	N/A	10%	50%	60/8	30%	30%
	Cultivation of easily erodible lands	N/A	10%	50%	60/8	30%	30%
Rangelands	Overgrazing	30%	60%	70%	70%	80%	40%
	Lack of mobility	30%	60%	70%	70%	80%	40%
	Lack of maintenance of rangeland infrastructure	30%	60%	70%	70%	40%	40%
	Cutting of shrubs	30%	30%	70%	70%	20%	40%
	Abandonment	20%	20%	15%	15%	20%	10%
	Lack of organizational, economic or other capacity	20%	20%	30%	30%	20%	20%
Rain-fed areas	Usage of marginal lands	20%	30%	5%	10%	50%	50%
	Excessive tillage	10%	30%	10%	10%	10%	30%
	Insufficient use of fertilizers	20%	15%	10%	10%	10%	10%
	Lack of awareness, training and capacity	20%	15%	20%	20%	20%	20%
	Lack of access to credit	20%	10%	30%	30%	10%	30%

* The table shows a general qualitative assessment of the various drivers of change of key ecosystems in the respective Central Asia countries. Please note that the figures in the table are based solely on the perceptions of the key informants interviewed as part of the background document development process (cf. Acknowledgment Section) and subjective. The color coding of the boxes indicates the perceived trends of severity of the drivers.

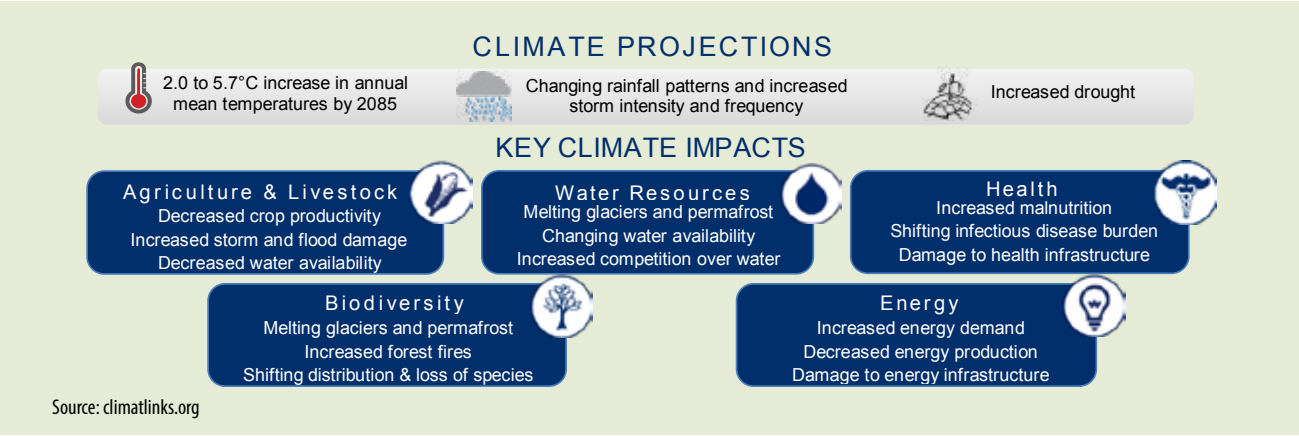


20 Rakhmatullaev et al., 2010.

21 IPBES, 2018b.

Central Asia is one of the regions in the world that is most vulnerable to climate change.[22] Around 60-80% of lands in Central Asia are arid and semi-arid and such areas are sensitive to over-exploitation and climate change.[23] Climate change scenarios for 2050 and 2099 predict severe water shortages in the region.[24] In fact, no other region of the world (outside of North Africa) is expected to suffer as severely from water shortages as Central Asia.[25] Over the next 50 years, there will be a predicted rise in temperature by 2-3 degrees Centigrade, reduced precipitation and a melting of glaciers (Figure 3).[26]

FIGURE 3: Overview of Climate Projections and Key Climate Impacts in the Central Asia Region



These changes are likely to create a new hyper-arid zone and speed up land degradation and desertification in semi-arid and arid areas of Central Asia.[27] In turn, hydrological changes in the region such as shift in peak river flow rates from summer to spring, ongoing land-use and land-cover changes are likely to exacerbate land degradation and desertification processes. Degraded areas have lower carbon storage capacity and thus contribute to climate change in the region.[28]

22 IPCC, 2007; Fay et al., 2010.
23 GTZ, 2007; FAO, 2017.
24 Reyer et al. 2015.
25 GTZ, 2007.
26 CAREC, 2017.
27 GTZ, 2007.
28 Micklin 2007; Lioubimtseva 2015.

What does IPBES Bring to the Conversation on Land Degradation?

The IPBES Thematic Assessment Report on Land Degradation and Restoration (2018) is the first comprehensive scientific assessment on land degradation at a global scale. The assessment has been conducted by a multidisciplinary team of experts between 2015 and 2018 and the main conclusions of the assessment were approved by 129 IPBES member states. The assessment identified current state and trends in land degradation and restoration and examined the direct and indirect drivers of land degradation. It also provided the estimated cost of land degradation, including the costs of action and inaction, and outlined future scenarios.

The IPBES report complements the LDN strategies developed and adopted by countries by expanding the 'impact basket'. That is, in addition to assessing the impacts of land degradation to the extent of ecosystems (e.g. forests), the IPBES land degradation assessment report also assesses its impacts on a suite of ecosystem services. In this way, land degradation is not only affecting forests and ecosystems but also affects people by diminishing the contributions made by these ecosystems to food security, water security and many more.

The IPBES Regional Report on Biodiversity and Ecosystem Services for Europe and Central Asia (2018) and Global Report on Biodiversity and Ecosystem Services (2019) also provide a critical assessment of the full range of issues facing decision-makers, including the importance, status, trends and threats to biodiversity and ecosystem services, as well as policy and management response options at regional and global levels. The reports collectively offer an insightful analysis in support of the Central Asia countries' ongoing and future efforts towards sustainable land rehabilitation, management and restoration and other relevant global agendas such as SDGs, Aichi biodiversity targets and UNCCD 2018-2030 Strategic Framework.
Central Asia with vast arid and semi-arid zones is prone to land degradation and desertification. Central Asia and the Middle East are among the most threatened regions by increasing soil salinity with a possible increase of 0.48 Mkm2 of degraded land.

Climate change scenarios predict severe water shortages in Central Asia, which are likely to accelerate land degradation and desertification and contribute to emergence of hyper-arid zones. The region, being a crossroad of civilization, is drawn into large-scale infrastructure mega-projects such as Silk Road Economic Belt. A number of studies point out that thorough environmental impact assessments should precede the implementation of such mega-projects because they potentially could contribute to exacerbation of water crisis, deterioration of vulnerable ecosystems and acceleration of energy consumption in Central Asia.

BRIGHT SPOT: CENTRAL ASIAN COUNTRIES CREATED A EURASIAN SOIL PARTNERSHIP (EASP)

Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russian Federation, Tajikistan, Turkey, Turkmenistan, Ukraine and Uzbekistan established a sub-regional soil partnership in 2013. The EASP's main goal is the implementation of sustainable soil management practices at a wider scale, especially in areas affected by soil salinity.

29 IPBES, 2018a, p.692.
30 Li et al. 2015.

What does IPBES Bring to the Conversation on Pollinators?

Several reports both in the scientific literature and in the media highlight the declining trends in pollinators in many parts of the world. The IPBES assessment report on pollinators, pollination and food production (2016) represents the current state of our knowledge on this issue. This report confirms much of the concerns raised about the state of pollinators and concludes that pollinators, which are economically and socially important, are increasingly under threat from human activities.

Central Asia is one of the top-three regions most vulnerable to pollination service loss in the world. About 14% of total agricultural crop output in Central Asia is dependent on pollination services. The region is increasingly experiencing water shortages due to climate change, the need to produce food and energy for the growing population and inefficient water infrastructure. As an adaptation strategy, transformation of agriculture practices has been observed in some countries, such as shifting from conventional cereal farming to horticulture, which requires less water but which is more dependent on pollinators. For example, rice, wheat and maize require 1,673m3/t, 1,827m3/t and 1,222m3/t of water respectively, whereas apples, strawberries, cucumber and tomato need only 822m3/t, 347m3/t, 253 and 214m3/t.[31]

Since many of the horticultural crops are dependent on animal pollination, the issues of pollinators and pollination loss are expected to become more serious in the near future. Many local fruits and vegetables such as apples, pears, apricots, melons, watermelons, etc. are extremely dependent on pollinators and are important components of local cuisine and culture. For example, apples, which were first domesticated in Central Asia, are considered to be one of the iconic fruits of the region.

There are national policy and legislative frameworks existing related to pollination and pollinators in the Central Asia (Box 2). Many countries have set national plans to increase honey production. Endemic honey bees of the Tien Shan Mountains in Central Asia have been recently documented as a new subspecies (*Apis mellifera pomonella*) of the European honeybee (*Apis mellifera*). It was found to be highly distinct and separate from European and west Asian subspecies that were brought into agricultural areas of Uzbekistan and Kazakhstan for managed beekeeping. The discovery of the new subspecies may help address genetic bottlenecks in honeybee populations in different regions.

Since Central Asia has very diverse ecosystems, it is important to preserve wild pollinators as well. Although honeybees are the most well-known pollinators in the region, they cannot pollinate all flower types, especially at high altitudes. That is why a diversity of pollinators is of crucial importance for the region.

BOX 2: LEGISLATION ON POLLINATION AND POLLINATORS ON NATIONAL LEVEL

Azerbaijan: The Beekeeping Law of Azerbaijan of 2009

Kazakhstan: The Law of the Republic of Kazakhstan on Beekeeping, dated 12 March 2002 (N 303)

Kyrgyzstan: The Law of the Kyrgyz Republic on the Development of Kyrgyz Agriculture, dated 26 May 2009 (No. 166)

Tajikistan: The Law of the Republic of Tajikistan on Beekeeping, dated April 16, 2012 (No. 820)

Turkmenistan: The law of Turkmenistan on beekeeping, dated 28 August 2015

Uzbekistan: Decree of the President of the Republic of Uzbekistan on measures for the further development of the industry beekeeping in the republic, dated 16 October 2017.

31 Christmann et al., 2014.
32 Sheppard, 2003.
33 Christmann, 2014.

Land Degradation and Pollination on a Country Level

Azerbaijan

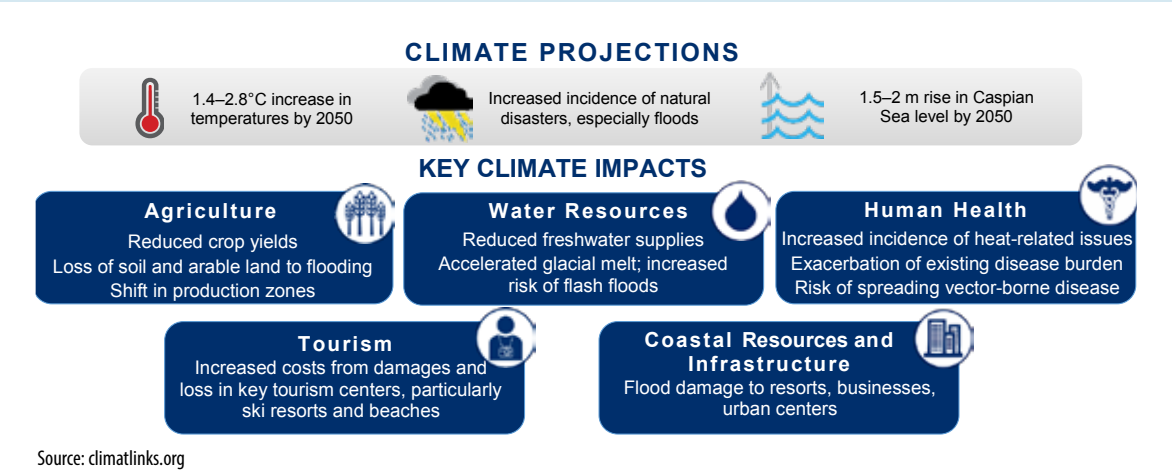
LAND DEGRADATION

About 36% of land in Azerbaijan (29,888 km2) appears degraded, including 34% of croplands and 8% of forested areas.[34] About 34% of arable lands on mountain slopes is prone to soil erosion and loss of fertility in Azerbaijan.[35] According to the Ministry of Agriculture, 41.8% (3,610 km2) of land in the country is degraded with about 20.7% being extremely degraded.[36] Greatest degradation by area is documented in Djulfin (93.8%), Orduban (80.2%) and Dashkesan districts (69.8%). The main drivers of land degradation are unsustainable land management practices such as excessive tilling on mountain slopes, water and wind erosion, overgrazing and extractive industries. Azerbaijan has been working on setting voluntary LDN targets.

CLIMATE CHANGE

Azerbaijan joined UNFCCC in 1995. The national legal framework for reducing greenhouse gas emissions includes the country's 2020 Development Concept, the State Program on Poverty Reduction and Sustainable Development, the Green Economy Concept and the National Program on restoration and expansion of forests. Azerbaijan has set targets to increase the share of renewable energy sources in electricity generation and overall energy consumption by 20% and 9.7% respectively before 2020. Azerbaijan plans to reduce greenhouse gas emissions by 35% by 2030.[37] Climate change is likely to result in reduced crop yields (especially rainfed potato and cotton), less water availability for irrigation, delayed planting, destroyed crops and soil erosion (Figure 4).[38]

FIGURE 4: Overview of Climate Projections and Key Climate Impacts in Azerbaijan



Source: climatlinks.org

34 Le et al., 2014.
35 Salimov and Mammadov, 2018.
36 Aliev and Aliev, 2000.
37 Against the 1990 baseline. Zoinet, 2018.
38 USAID, 2017.

POLLINATION

Azerbaijan boasts a great diversity of pollinators. For example, there are around 126 species of mining bees (*Andrenidae*) in Azerbaijan. These wild, solitary ground-nesting bees are important providers of pollination services.[39] During the Soviet era, Azerbaijan was a major honey producer breeding Caucasian honey bee (*Apis mellifera caucasia*). However, in 1980s, a parasite outbreak decimated the Caucasian honey bee population. A southern subspecies of the Caucasian honey bee was used to restore the bee population, however, the hybrid bees proved to be less productive. In 2018, some 300,000 beehives in Azerbaijan produced about 300 tons of honey. The beekeepers are planning to increase the number of beehives to 500,000 in 2019 and collect more than 500 tons of honey.

Several export crops of Azerbaijan such as pomegranates, oranges, watermelons, and tomatoes are highly dependent on pollinators (Table 3). These pollinator-dependent crops are also an essential part of local cuisine and healthy diet. Some pollinator-dependent crops such as pomegranates are perceived as cultural symbols of Azerbaijan.

TABLE 3: Selected top export crops for Azerbaijan[40] and their level of dependence on pollinators

Crop	Export value US$ 1,000	Dependence on pollinators[41]
Vegetable oil	109,445.5	Unclear[42]
Fruit (Pomegranate/orange/grapes)	96,660.2	Great/Little/no dependence
Wheat, flour	50,621.4	No dependence
Tea	49,807.3	No dependence
Potatoes	38,642.1	Increase reproduction
Rice	36,431.2	No dependence
Maize	12,142.9	No dependence
Vegetables (melon/ watermelon/ cucumber/ tomato, etc.)	9,162.6	Essential/essential/essential/Little

BRIGHT SPOT: GOVERNMENT IS SUPPORTING BEEKEEPERS

In last decade, the Government of Azerbaijan has been supporting and promoting bee-keeping in the country. In 2009, the Law "On beekeeping" has been adopted followed by governmental support programs. For example, one support program provides 10 Azeri Manat (about US$ 5.9) for each hive in subsidies for the beekeepers. In 2015, a joint program with FAO has been launched aimed at building local beekeepers' capacities and enhancing local bee productivity and genetic diversity.

39 Aliyev et al., 2017.

40 https://www.stat.gov.az (Data for 2018. The Foreign Trade of Azerbaijan. Yearbook 2019).

41 The dependence is identified as essential, great, moderate, little, increase reproduction or no dependence based on http://www.fao.org/fileadmin/user_upload/pollination/docs/POLLINATION_VALUE_ARRAY.xls

42 Statistical data did not specify types of vegetables.

Kazakhstan

LAND DEGRADATION

According to the World Bank estimates, 66% of the country is prone to desertification.[43] About 60% of land in Kazakhstan (1,619,584 km2) is degraded, including 57% of croplands, 21% of forested areas and 38% of grasslands.[44] Wind erosion results in loss of fertility and loss of soil organic matter on more than 11 million ha of rain-fed areas in northern Kazakhstan.[45] Some estimates suggest that that the cost of desertification in Kazakhstan is as high as US$ 6.2 billion[46], whereas most recent study of annual costs of land degradation estimate it to be US$ 3.06 billion (US$ 1,782 per capita).[47]

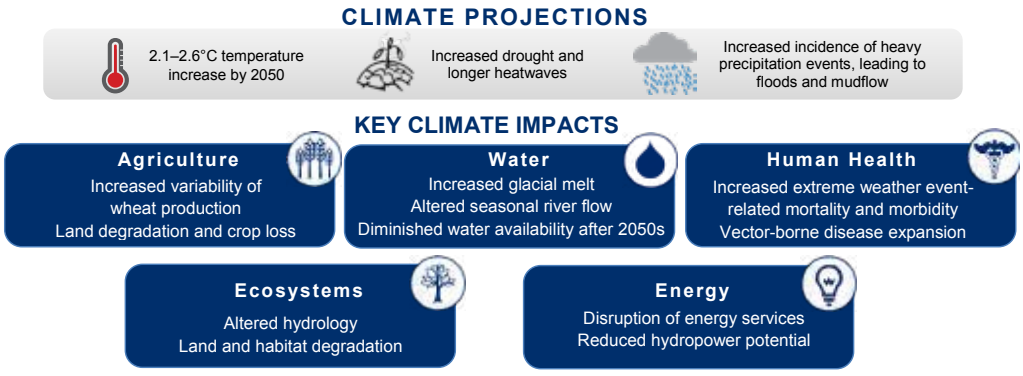
Animal breeding is one of the key elements of local livelihoods in Kazakhstan. As of January 2019, there are over 7 million, over 2.3 million horses and more than 18 million sheep. Around two-thirds of Kazakhstan's national territory is potential pasture land. The pastures in the vicinity of villages and streams are degraded due to overgrazing, whereas remote pastures are degrading due to "undergrazing" as the steppe ecosystem relies on regular grazing. Lack of mobility of family farmers who possess 90% of all livestock in Kazakhstan are creating this pressure on pastures near the settlements.[48] Climate change scenarios anticipate the decrease of freshwater resources by 20-30%, which would result in dramatic falls in grain yields and pasture productivity.

Kazakhstan has set the national LDN Target.[49] The specific measures for achieving the LDN Target have been proposed by the Ministry of Agriculture in the State program for the development of the agro-industrial complex of the Republic of Kazakhstan for 2017-2021. The examples of specific measures are: inclusion of fallow and abandoned lands in the turnover, creation of woody and shrub plantations to protect the land from water and wind erosion, investment in restoration of degraded lands and irrigation infrastructure, etc.

CLIMATE CHANGE

Kazakhstan has joined the UNFCCC in 1995. The national legal framework for reducing greenhouse gas emissions includes the Law on energy saving and efficiency, the Law on renewable energy and the Strategy for building Green Economy. Kazakhstan pledged 15% reduction of greenhouse gas emissions[50] by 2030. With an international support including

FIGURE 5: Overview of Climate Projections and Key Climate Impacts in Kazakhstan



Source: climatlinks.org

43 WBG, 2012.
44 Le et al., 2014
45 Pender et al., 2009.
46 Saigal, 2003.
47 Mirzabaev et al., 2016.
48 GTZ, 2007.
49 See Annex 1.
50 1990 baseline

technology transfer and favorable economic conditions, Kazakhstan can reduce emission by 25-34% between 2021 and 2030.[51] Kazakhstan irrigated agriculture is likely to be most severely affected by the climate change as southern regions of the country will get drier and the Syr Darya River run off will decrease by 6-10% (Figure 5).[52]

POLLINATION

The forage crops used for animal feed such as alfalfa (*Medicago* sp.), clover (*Trifolium* sp.) and soy (e.g. *Melilotus* sp.) are highly dependent on pollinators such as Hymenoptera, especially various solitary bee species and domestic honey bees (Apis sp.). For alfalfa and clover wild pollinators prove to be more effective than honeybees because these crops' flowers must be tripped by specially adapted pollinators for pollen release.[53] In south-eastern Kazakhstan 82 species of insects in 14 families and 3 orders provide pollination services to forage crops such as alfalfa, soybeans, sainfoin, trefoil, and clovers. Some 8 species of solitary bees such as *Anthidium cingulatum, Hoplitis parvula, Megachile rotundata, Metallinella leucogastra, Osmia coerulescens, O. parvula, O. rufa*, and *Ceratina cyanea*) as well as honey bees (*Apis mellifera*) and bumblebee have been documented as the most effective pollinators for forage crops.[54] Intensification of agriculture manifested in overuse of fertilizers, pesticides and herbicides, increase in a field size, reliance on monoculture as well as rapid rotation between forage crops and other cash crops reduces the abundance and diversity of wild pollinator species.[55]

Managed pollinators are also important for local livelihoods. There are about 4-5 thousand beekeepers in Kazakhstan, who produce more than 12,000 tons of honey annually. Some of the major cash crops are also dependent on pollinators to varying extent (Table 4).

TABLE 4: Selected top export crops for Kazakhstan[56] and their level of dependence on pollinators

Crop	Export value US$ 1,000	Dependence on pollinators[57]
Wheat, flour	1,130,133.8	No dependence
Barley	137,806.3	No dependence
Flax seed	108,544	No dependence[58]
Cotton	89,847.3	Modest
Sunflower seeds	89,240.8	Modest
Oil (cotton, sunflower), oilseed meals	82,107.3	Modest
Beans, soybeans, peas	58,893.7	Modest/Little
Rapeseed	53,602.8	Modest
Potato	35,745.4	Increase production

BRIGHT SPOT: STRATEGIC PLAN

Kazakhstan has developed and adopted a Strategic Plan for combating desertification for 2015-2025. This plan provides analysis of current trends in land degradation and maps relevant projects as well as stakeholders. This document is product of cooperation between the Government of Kazakhstan and the GEF-UNDP.

51 CAREC, 2018.
52 CAREC, 2011.
53 Bohart, 1958.
54 Temreshev, 2017.
55 Temreshev, 2017.
56 Ministry of agriculture of the Republic of Kazakhstan https://moa.gov.kz/documents/1543462437.pdf (Data for 2018).
57 The dependence is identified as essential, great, moderate, little, increase reproduction or no dependence based on http://www.fao.org/fileadmin/user_upload/pollination/docs/POLLINATION_VALUE_ARRAY.xls
58 Although insect pollinators have been reported to favor gene flow in flax (Jhala et al., 2011).

Kyrgyzstan

LAND DEGRADATION

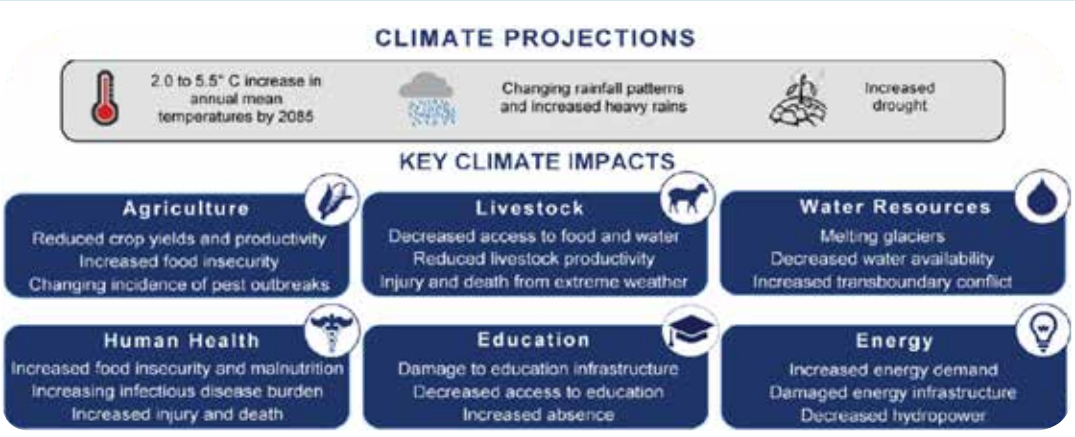
About 21% of land in Kyrgyzstan (39,936 km2) is degraded, including 21% of croplands, 13% of forested areas and 38% of grasslands.[59] It is estimated that 33% of rural population lives on degraded land (1.2 million people as of 2010) and the annual cost of land degradation falls between US$ 550 million and US$ 600 million, which makes up 11-16% of country's GDP (Mirzabaev 2016, UNCCD 2018). Wind and water erosion and forest felling are also drivers of land degradation in some areas (GTZ 2007). Kyrgyzstan has pioneered adoption of a Pasture Law and establishment of Pasture Committees. These changes are aimed at restoring herd mobility and seasonal use of pastures.

Kyrgyzstan has set voluntary LDN targets with particular targets on improvement of pasture management. The Ministry of Agriculture, Food Industry and Melioration of the Kyrgyz Republic plans to improve the environmental condition of pastures by implementing a pasture rotation system in 40 village districts, improving pasture infrastructure such as bridges, roads and wells, and promoting sustainable land management practices.

CLIMATE CHANGE

Kyrgyzstan has joined the UNFCCC in 2000. The national legal framework includes the Governmental Decree on Implementation of UNFCCC and the Law on Regulations and policy for greenhouse emissions and sequestration. Kyrgyzstan pledged 11.49-13.75% reduction of greenhouse gas emissions by 2030 and 12.67-15.69% by 2050.[60] Kyrgyzstan has a high level of vulnerability to climate change. Climate change scenarios predict increased melting of glaciers and frequency of extreme weather events such as landslides and floods in mountainous areas. In last 50-60 years, 14-30% of all glaciers have melted in Tian-Shan and Pamir mountains of Central Asia (Figure 6).

FIGURE 6: Overview of Climate Projections and Key Climate Impacts in Kyrgyzstan



Source: climatlinks.org

59 Le et al., 2014.

60 Against the "business-as-usual" scenario. CAREC, 2018.

POLLINATION

Kyrgyzstan produces 12,000 tons of honey annually, which is traded internationally and domestically. Pollinators are essential for growing apples, pears and apricots, which are cash crops for many rural communities in rural areas of Kyrgyzstan (Table 5). Farmers exported more than 133,000 tons of apples and 2,500 tons of fresh apricots. Pollinator diversity surveys in apple orchards in Ysyk-Köl and Chüi regions of Kyrgyzstan documented 67 species that belong to 11 genera (namely, 15 species of Andrena genus, 2 of Anthrophora, 11 of Bombus, 7 of Halictus, 17 Lasioglossum, 2 of Nomada, 4 of Glossium, 4 of Sphecodes, 3 Xylocopa and 1 of Apis and Eucera). These results show greater pollinator diversity in the apple orchards in Kyrgyzstan than previous studies had shown.[61]

TABLE 5: Selected top export crops for Kyrgyzstan[62] and their level of dependence on pollinators

Crop	Export value US$ 1,000	Dependence on pollinators[63]
Vegetables (potatoes/beans/garlic, etc.)	75,209.8	Increase production/Little/ increase production
Fruits (apples, pears, apricots, etc.)	34,241	Great
Cotton, cotton fabric	25,543.3	Modest
Tobacco, tobacco products	22,799.7	Modest/Great[64]
Sugar beet	260.2	No dependence

Kyrgyzstan is a home for 16 subspecies of Apollo butterflies (*Parnassius apollo*), some of which are endemic. Even though Apollo butterflies do not provide pollination services to the cash crops, these wild pollinators have become iconic species in the country. Kyrgyzstan is sometimes referred to as "the country of Apollo".

Although there are no data on current status and trends in pollinator abundance, qualitative observations show that their numbers are likely to be declining, especially among wild pollinators. Experts note that sightings of previously abundant wild pollinators have become rare. Another indirect indicator of wild pollinator decline may be failing harvests of endemic wild apple and pear species such as Niedzwetsky apple (*Malus niedzwetzkyana*), Korhinsky pear (*Pyrus korshinskyi*) and Turkmen pear (*Pyrus turcomanica*).[65] Radzevičiūtė et al. (2017) have found that several RNA viruses associated with honey bees (e.g. deformed wing virus complex) infect not only honey bee (*Apis mellifera*) but also many other wild bee species.

BRIGHT SPOT: DOCUMENTING TRADITIONAL ECOLOGICAL KNOWLEDGE (TEK)

A number of NGOs and research institutions have been documenting traditional ecological knowledge of local communities. For example, published sources on TEK related to sustainable use of pastures contain information about indigenous classification of pastures, plant-based indicators for identifying the quality and carrying capacity of a pasture and knowledge on medicinal and poisonous plants for livestock. There are also networks of community organizations and NGOs such as "*Altyn El Akyl Kazyna*" [literally "Golden Treasure of People's Wisdom"]. These networks cooperate among themselves and share knowledge and skills related to land, water, forests, livestock and other resources.

61 Zhusupbaeva, Paxton, Huseman, Soro, Japoshvili (unpublished field data, 2019).

62 www.stat.kg (4.03.00.10 Export of basic commodities. Data for 2018)

63 The dependence is identified as essential, great, moderate, little, increase reproduction or no dependence based on http://www.fao.org/fileadmin/user_upload/pollination/docs/POLLINATION_VALUE_ARRAY.xls

64 Barrachi et al 2017. Nicotine-containing nectars may alter pollinators' behavior

65 Flora and Fauna International, Bishkek office.

Tajikistan

LAND DEGRADATION

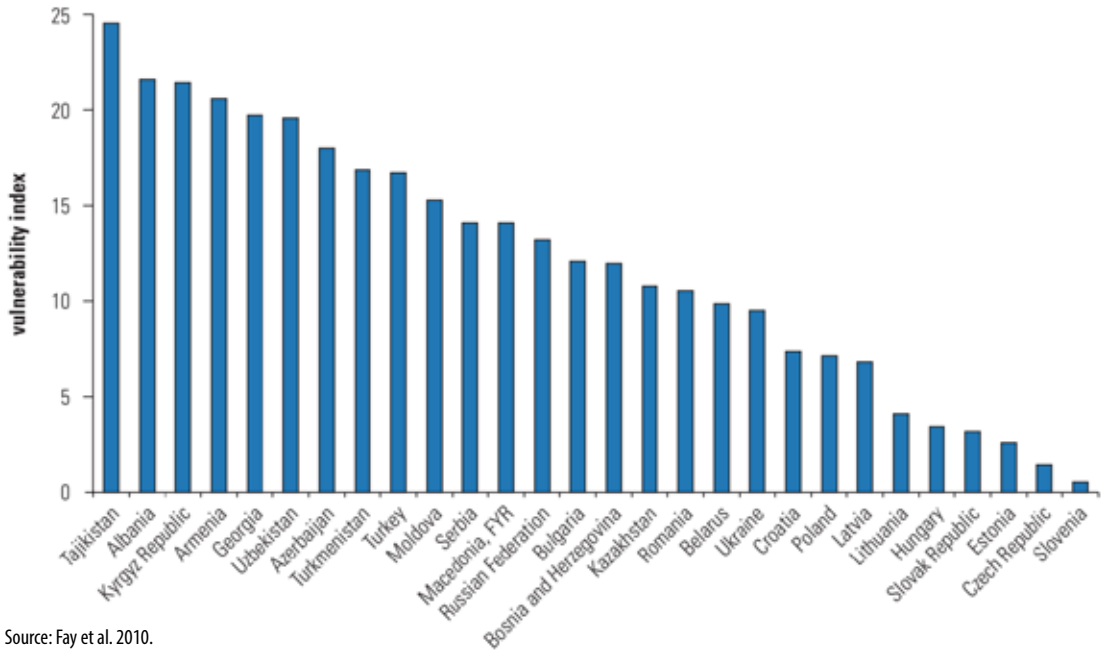
About 12% of land in Tajikistan (17,472 km2) is degraded, including 23% of croplands and 15% of grasslands.[66] Annual costs of land degradation are estimated to be US$ 0.5 billion (US$ 609 per capita).[67] Total economic value of land ecosystems is estimated to be US$19 billion, which is almost 4 times greater than country's GDP (as of 2019). Tajikistan has not set voluntary LDN Targets yet.

CLIMATE CHANGE

Tajikistan joined UNFCCC in 1998. The national legal framework includes National Development Strategy for 2016-2030 and the National Action Plan for Climate Change Adaptation and Mitigation adopted in 2003. Tajikistan pledged 10-20% reduction of greenhouse gas emissions by 2030. With an international support Tajikistan can cut emission by 25-3o% by 2030.[68]

Tajikistan is one of the countries that are most vulnerable to climate change (Figure 7). Climate change is likely to positively affect summer pastures, whereas winter pastures are likely to be further degraded. Rise in temperature will lead to increased melting of glaciers. Annually, the region is estimated to lose 0.1-2% of glaciers, which leads to a reduction of water run-off. In a long term, a significant reduction of water run-off will pose unprecedented threats for irrigation agriculture, water supply and hydropower generation.

FIGURE 7: Climate Change Vulnerability Index



Source: Fay et al. 2010.

66 Le et al., 2014
67 Mirzabaev et al., 2016.
68 CAREC, 2018.
69 Zoi Environmental Network, 2009.

POLLINATION

Many export crops of Tajikistan are dependent on pollinators (Table 6). Cotton is one of the main cash crops for the local communities in the Fergana valley. Extensive land exploitation and use of pesticides and herbicides have negatively affected wild pollinators. Although cotton is considered to be moderately dependent on pollinators, pollinator services can increase cotton yield on average by 19-33%. Experimental studies in the Fergana valley showed that honey bees increase cotton yields by 56%, while the quality of fiber and fat content did not appear to have changed (Table 7). Pollination services provided by honey bees increased the productivity of cherries and almonds by 26.4 and 16.9% respectively (Table 8). Pollinator-dependent crops such as melons and watermelons (as well as other vegetables and fruit) are inalienable part of local cuisine and a source of nutrients. The beekeepers in Tajikistan own more than 228,000 hives and produce about 4.1 tons of honey annually. Beekeepers from the region reported to have used local religious and cultural values related to honey bees to educate the community about the pollinators and their services.

TABLE 6: Selected top export crops for Tajikistan[70] and their level of dependence on pollinators

Crop	Export value US$ 1,000	Dependence on pollinators
Cotton	121,000	Modest
Fruit	9,015.6	Great/Essential
Vegetables	4,154	Great/Essential
Tobacco and tobacco products	3,500	Modest/Great?[71]

TABLE 7: To what extent pollinators (*Apis mellifera*) can increase cotton yields in Fergana valley[72]

Crop	Export value US$ 1,000	Dependence on pollinators	Control	Increase
Quantity (cotton boxes)	unit	369	257	43.6%
Fallen flowers	unit	79	148	-87%
Mass of 1 cotton box	gram	5.12	4.54	12.8%
Mass of the seeds	gram	114.4	99.1	15%
Fat content	Per cent	20	19.54	2.3%

TABLE 8: The extent pollinators (*Apis mellifera*) can increase yields in Fergana valley[73]

Crop	Cherry	Almond	Plum	Apples	Apricots	Persimmons	Quince	Peach	Total
In-cease in %	26.4	16.9	11.2	8.3	5.9	4.1	1.43	1.19	
Number of studies	11	3	5	5	7	7	2	10	**50**

BRIGHT SPOT: WOCAT DATABASE

The World Overview of Conservation Approaches and Technologies (WOCAT) is a global Network that was established in 1992. The WOCAT Network launched efforts to compile, document, evaluate, share, disseminate, and apply sustainable land management (SLM) knowledge. WOCAT played an essential role in moving away from a land degradation focus towards SLM, defining SLM and its measures (WOCAT 2019). Central Asian countries have been actively contributing regional SLM knowledge to the Network. Land degradation forces appropriation of untouched lands to compensate for the land loss due to degradation. Hence, adoption of SLM practices by local communities in the region positively affects wild pollinators by preserving their habitats.

70 www.stat.tj (Data for 2017. Export of goods 1993-2017).
71 Barrachi et al 2017. Nicotine-containing nectars may alter pollinators' behavior
72 Based on data provided by Suyarkulov Sh.
73 Based on data provided by Suyarkulov Sh.

Turkmenistan

LAND DEGRADATION

About 8% of land in Turkmenistan (36,736 km2) is degraded, including 32% of croplands and 23% of grasslands.[74] Annual costs of land degradation per capita are estimated to be 1,083 USD.[75] Degradation of pastures is most severe and happens due to several processes:[76]

a) Conversion of pastures to irrigated agricultural land (e.g. 86% of pastures in Dashoguz region (4500 km2) have been converted from 1974 to 2004
b) Emergence of soil biogenic crust (consisting of the moss *T. desertorum*, lichens and cyano-bacteria) on remote pastures due to undergrazing
c) Pastures in the vicinity of the irrigated and populated areas showed signs of rehabilitation. Nonetheless, some of these areas were degraded due to flooding, water logging and "technogenic desertification", that is a complete removal of the vegetation cover around man-made features (buildings, gas and water-pipes, roads etc.).
d) secondary salinization in the irrigated areas

POLLINATION

There is no data on status and trends in pollinator diversity and abundance in the country, however, the according to experts' opinion land degradation caused by overgrazing and extractive industries lead to fragmentation and/or loss of (semi-) natural habitats of wild pollinators.

Pollinator-dependent crops such as melons and watermelons (as well as other vegetables and fruit) are inalienable part of local cuisine and a source of nutrients. Alhagi (*Alhagi*) honey is considered as a delicacy with strong medicinal qualities in Turkmenistan and other countries in the region. Beekeepers from the region reported to have used local religious and cultural values related to honey bees to educate the community about the pollinators and their services.

TABLE 9: Selected top export crops for Turkmenistan and their level of dependence on pollinators

Crop	Export value US$ 1,000	Dependence on pollinators[77]
Cotton, raw and yarn	306,000[78]	Modest

74 Le et al., 2014.
75 Mirzabaev et al., 2016.
76 Kaplan et al., 2014.
77 The dependence is identified as essential, great, moderate, little, increase reproduction or no dependence based on http://www.fao.org/fileadmin/user_upload/pollination/docs/POLLINATION_VALUE_ARRAY.xls
78 https://oec.world/en/profile/country/tkm/

BRIGHT SPOT: REGIONAL COOPERATION FOR COLD WINTER DESERTS MANAGEMENT

Central Asian countries with winter cold deserts, namely China, Iran, Kazakhstan, Mongolia, Turkmenistan and Uzbekistan are cooperating to conserve central Asia's cold winter deserts, which are among the least protected biomes worldwide. Cold winter deserts provide a wide array of ecosystem services, including provision of pasture. The project support local institutions through joint research, strategy development and planning, setup of new protected areas as well as capacity-building through fellowship.

Uzbekistan

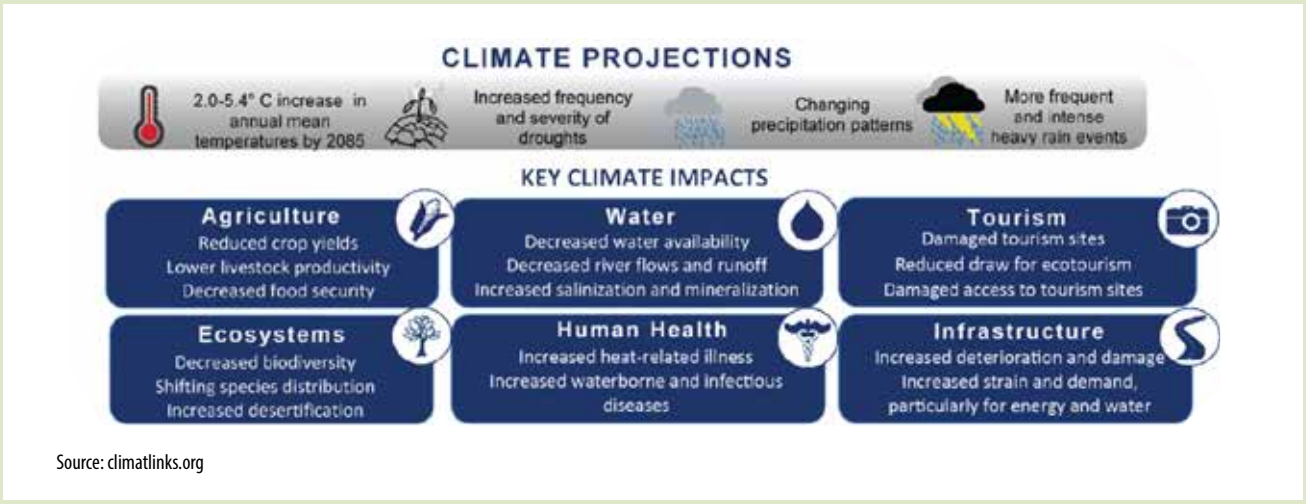
LAND DEGRADATION

About 8% of land in Uzbekistan (35,136 km2) is degraded, including 26% of croplands and 17% of grasslands.[79] Some studies estimated that Uzbekistan loses up to US$ 1 billion due to land degradation.[80] Annual costs of land degradation equals US$ 0.83 billion (US$ 237 per capita).[81] Main drivers of land degradation is soil salinization in cotton and rice growing areas of the country. Uzbekistan inherited a highly ineffective irrigation system from the Soviet Union as well as the environmental disaster of the Aral Sea.

CLIMATE CHANGE

Uzbekistan joined UNFCCC in 1993. The measures for adapting to climate change and mitigating its adverse impacts are reflected in the National Strategy for Structural Reforms "Vision-2030". Uzbekistan plans to reduce greenhouse gas emission by 10% by 2030[82] with support from international community. Climate change scenarios predict emergence of hyper-arid zones and increasing risk of droughts in arid zones of Uzbekistan. Increasing aridity coupled with reduced run-off of the major rivers such as Syr Darya and Amu Darya will adversely affect extensive agriculture of the country (Figure 8).[83]

FIGURE 8: Overview of Climate Projections and Key Climate Impacts in Uzbekistan



Source: climatlinks.org

79 Le et al., 2014.
80 Sutton et al., 2007.
81 Mirzabaev et al., 2016.
82 Against 2010 baseline. CAREC, 2018.
83 CAREC, 2018.

POLLINATION

Many local cash crops such as cotton, fruits and vegetables are highly dependent on pollinators (Table 10). According to local beekeepers, having beehives on the cotton field can increase the yields by 10-100% and produce 0.5-3.5 kg of honey per day. Farmers are also being trained at creating favorable habitats for pollinators around their plots.[84] Researchers working[85] in Surkhandarya region of Uzbekistan found out that there only 5-6 pollinator species at the study site, namely, honey bee (*Apis mellifera*), bumblebee (*Vespa*), wasp (Masarinae), fruit fly (*Drosophilidae*) and ants (*Formicidae*) (Table 11). These pollinator species managed to pollinate various cash crops to a varying extent. Uzbekistan produces about 15,400 tons of honey per year and it is planned to increase the production up to 23,700 tons by 2021. It is estimated that pollinator ecosystem services may be 10-12 times more than from revenue from all apiculture products such as honey, wax, etc.[86]

TABLE 10: Selected top export crops for Uzbekistan[87] and their level of dependence on pollinators

Crop	Export value US$ 1,000	Dependence on pollinators[88]
Cotton	1,200,000	Modest
Vegetables (tomatoes, cucumbers, melons, etc.)	333,000	Little/great/essential
Grapes, fresh and dried	157,000	No dependence
Cherries, fresh	52,000	Great
Persimmons, fresh	35,000	Little
Apricots, fresh	30,000	Great

TABLE 11: Effectiveness of pollinators for various crops

	Pollinator	Crop and pollination percentage									
		crop	%	crop	%	crop	%	crop	%	crop	%
1.	Honey bee (Apis mellifera)	apricot	40-50	apples	20-25	peach	5-10	plum	5-10	pomegranate	3-5
2.	Bumble-bee (Vespa)	apples	50-60	peach	10-20	apricot	5-10	pear	5-10	-	-
3.	Wasp (Masarinae)	apricot	30-40	pear	30-35	apples	20-25	-	-	-	-
4.	Fruit fly (Droso-philidae)	peach	30-40	apri-cot	30-40	apples	15-20	-	-	-	-
5.	Ants (Formicidae)	apples	30-35	apri-cot	30-35	pomegranate	20-30	-	-	-	-

BRIGHT SPOT: APICULTURE PROGRAMS AT UNIVERSITIES AND VOCATIONAL SCHOOLS

In 2017, the beekeepers united into an Association and received a support from the Government in a form of tax cuts until 2023 for importing apiculture-related equipment and privileges such as a right to bring hives into state-owned forests and protected areas. Since 2017, about 40 students get enrolled in apiculture programs annually offered at two universities in Uzbekistan.

84 Farming with alternative pollinators (FAP)/ICARDA
85 A project by Biodiversity International
86 Suyarkulov Sh. Personal communication.
87 WBG 2018. Data for 2016.
88 The dependence is identified as essential, great, moderate, little, increase reproduction or no dependence based on http://www.fao.org/fileadmin/user_upload/pollination/docs/POLLINATION_VALUE_ARRAY.xls

International Processes and Regional Projects Underpinning National Actions

UNCCD is a legally binding international agreement linking environment and development to sustainable land management. UNCCD's key target of achieving LDN in 2018-2030 Strategic Framework is reflected in SDG 15.3. Uzbekistan joined the UNCCD in 1995, Turkmenistan in 1996, Kazakhstan, Kyrgyzstan and Tajikistan in1997 and Azerbaijan in 1998.

IPBES is an independent intergovernmental body that provides policymakers with objective scientific assessments about the state of knowledge regarding the planet's biodiversity, ecosystems and the benefits they provide to people, as well as the tools and methods to protect and sustainably use these vital natural assets. The IPBES offers a catalogue of policy support tools and methodologies to support the suggestions of policy options as part of the Trialogue and other processes.

SDGs: The United Nations Agenda 2030 for Sustainable Development is embraced by all Central Asian countries, addresses the concerns about land degradation and food security in goals 13 and 15 as follows: SDG13: "Take urgent action to combat climate change and its impacts" and SDG15: "Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss" (UN 2016). The SDGs are explicit about biodiversity and ecosystem services and could facilitate the creation of regulations to protect pollinators.

IPCC: The Intergovernmental Panel on Climate Change is an intergovernmental body of the United Nations, dedicated to providing the world with an objective, scientific view of climate change, its natural, political and economic impacts and risks, and possible response options. In 2016, IPCC published A IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems.

Coalition of the Willing on Pollinators: The key messages of IPBES assessment were recognized by the CBD at the Thirteenth meeting of the Conference of the Parties (COP) to CBD in Cancun, Mexico, 2016 (Decision CBD/COP/DEC/XIII/15). This stimulated a limited number of countries to form a "Coalition of the Willing" to work on some of the key problems identified in the assessment. This coalition is committed to taking action to protect pollinators and their habitats by developing and implementing national pollinator strategies; share experience and lessons learnt in developing and implementing national pollinator strategies, especially knowledge on new approaches, innovations and best practices; reach out to seek collaboration with a broad spectrum of stakeholders – countries as well as businesses, NGOs, farmers, local communities; develop research on pollinator conservation; and mutually support and collaborate with each other – and those parties that are willing to join the coalition.

The Regional Environmental Centre for Central Asia (CAREC) is an independent, non-political and non-for-profit international organization was created to assist the Central Asian governments, international, regional and national stakeholders in addressing environmental and sustainability challenges across Central Asian region and Afghanistan. By promoting dialogue and collaboration among all environmental stakeholders, CAREC has today become a leading regional knowledge hub in the field of environment and sustainable development recognized by national, regional and international partners. CAREC was established in 2001 by a joint decision of all five Central Asian states (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan), European Union and UNDP, following the resolution of the IV Pan-European Conference held in 1998, Aarhus (Denmark).

Central Asian Countries Initiative for Land Management (CACILM) is a program to halt desertification and promote sustainable use of natural resources, as well as to combat poverty among people in rural areas. In the CACILM program, international partners pool their support to improve resource management in the five Central Asian countries. They plan to make around US$ 700 million available between 2006 and 2016, including funds from the Global Environment Facility (GEF) and the Asian Development Bank. The second phase of the project is called Integrated natural resources management in drought-prone and salt-affected agricultural production landscapes in Central Asia and Turkey (CACILM 2).

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ANNEX 1

LDN Targets at National Level

Azerbaijan
Not available

Kazakhstan
LDN Target: "The Republic of Kazakhstan strives to achieve land degradation neutrality by 2030."

Kyrgyzstan
Ministry of Agriculture, Food Industry and Melioration of the Kyrgyz Republic (MAFIM) developed and approved the following voluntary goals within the sphere of LDN:

1. Improve the environmental condition of pastures by implementing a pasture rotation system in (not less than) 40 ayil aimaks (village districts);
2. Improve access to 10,000 ha of pastures via improved pasture infrastructure (bridges/roads, water points);
3. Sustainable land resources management practices are implemented in 100,000 ha of land (including pastures and forests);
4. Reclamation (melioration) works are carried out in 10,000 ha of agricultural lands.

Tajikistan
Not set

Turkmenistan
Not set

Uzbekistan
The voluntary LDN target adopted by Uzbekistan is "By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world".

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