

# Regional Action Document on Land Degradation, Biodiversity and Climate Change for Central Asia and Azerbaijan

**9-11 October 2019**  
Almaty, Kazakhstan

## **ACTION DOCUMENT**

**Outcome of BES-Net's  
Central Asia and Azerbaijan  
Regional Trialogue:**

**Bright Spot for Land  
Degradation Neutrality,  
Pollinators and Food Security**



*Empowered lives.  
Resilient nations.*



Federal Ministry  
for the Environment, Nature Conservation  
and Nuclear Safety





Empowered lives.  
Resilient nations.



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.



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 (BES-Net Trialogues); National Ecosystem Assessments; and Online platform for networking—with all components mutually reinforcing. BES-Net is hosted by UNDP GC-RED.

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# Statements from the Organizers

“Central Asia countries share common challenges of land degradation and desertification, as illustrated by the deterioration of quality and productivity across cultivated pasture and forest lands. The transboundary nature of the issue underscores the need to strengthen coordination efforts across States boundaries for sustainable land management and biodiversity conservation at regional, national and local levels. Therefore, it is a great honor for us to host the leading experts from government organizations, academia and practices under the Triologue platform and to support them to build a unified regional partnership and a common agenda of action.”



**Hon. Yerlan Nyssanbayev**

*Vice Minister*

Ministry of Ecology, Geology and Natural Resources, Kazakhstan



“A concerted effort is required to deliver on the Sustainable Development Goals. The Triologue helped us deliberate on region-specific challenges and opportunities in land degradation, biodiversity and associated ecosystem services. UNDP Kazakhstan, in close cooperation with all key stakeholders across the private sector and the civil society, will remain fully committed to support Kazakhstan’s transition towards a green economy and a society where rising harm to the environment is only taught in history class.”



**Mr. Vitalie Vremis**

*Deputy Resident*

*Representative*

UNDP Kazakhstan



“In the face of an unprecedented decline of global biodiversity, our efforts towards sustainable land management and ecosystem conservation must be underpinned by the best science that humanity can produce. Enhancing the awareness, ownership and commitment to act on the latest biodiversity-related thematic knowledge and evidence is therefore among our priorities. Through BES-Net, we will continuously seek to create a tri-dimensional coordination where the science community informs policy community; the policy community guides and empowers practice community; and the practice community inspires science community.”



**Elie Kodsi**

*Senior Technical Advisor*

UNDP Global Policy Centre on Resilient Ecosystems and Desertification

“We need to address direct and indirect drivers of biodiversity loss urgently, get a grip on current unsustainable resource use and promote decisive actions now and in the coming years, to make the post-2020 Global Biodiversity Framework a success. We are convinced that bringing together academic scientists, policymakers and practitioners with local knowledge holders is crucial and a right way forward in Central Asia, as the multi-sectoral collaboration would help explore and design intelligent and integrated solutions to protect our very basis of life.”



**Ms. Claudia Schmidt**

*Deputy Consul-General,*

*Embassy of Germany*

Kazakhstan



# Feedback from the Participants

“A good lesson I learned from the Trialogue is that every single element of the ecosystem is important, and each element performs a very important function, even if they are small bees, butterflies or insects. Before the Trialogue the term, pollination, was unknown to me. Now I am thinking about introducing this into our work on pasture and forest management, because I found some valuable connections and insights. An important outcome of this Trialogue is a change of the attitude towards pollination and pollinators and I believe that such attitude has changed significantly not only for me, but also for many other participants.”

**Aida Gareeva**  
Kyrgyz NGO Alatoo  
Kazakhstan

“The pollination process affects not only producers, but also the entire biodiversity system of Kazakhstan. The Trialogue allowed us to find that there is lack of communication and provided an opportunity to get knowledge and experience from one another within and across the participating countries. We must build on the learning from the Trialogue and develop joint collaborative programs between practitioners, governments and academic communities to bring positive results.”

**Elena Kurganova**  
Executive Secretary of the Beekeepers Union  
Bal-Ara and the Association of Nuts and Berries  
Producers  
Kazakhstan

“As a representative of the Ministry of Economy, my work is more related to economic issues and I was not very familiar with the local farmers and practitioners until now. This Trialogue has created a platform to share insightful knowledge and experience with them, as well as other relevant stakeholders. It provided me with the opportunity to learn at the national and regional levels that I will report to the leadership of the Ministry of Economy. My wish is that such meeting be organized not only at the national and regional levels, but also at a broader level so that participants from other regions, such as Europe, Central Asia, Africa, could meet and share their experience of dealing with challenges they face.”

**Narmin Safarli**  
Department of Cooperation with International Organizations, Ministry of Economy  
Azerbaijan







# I. INTRODUCTION

This Action Document presents the key discussion points and agreed priority areas of actions generated as a result of the BES-Net’s Regional Triologue for Central Asia and Azerbaijan on Land Degradation, Biodiversity and Climate Change held in Almaty, Kazakhstan on 9-11 October 2019. The event aimed to strengthen the interface between science, policy and practice, and mainstream findings from the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) thematic assessment reports into national policies, research, and planning processes.

To date, IPBES produced two thematic assessment reports, which are of critical importance and value to the Central Asia countries and Azerbaijan in addressing the inter-linked land-biodiversity-climate agendas: 1) Thematic Assessment Report on Land Degradation and Restoration (2016); and 2) Thematic Assessment Report on Pollinators, Pollination and Food Production (2018). The platform’s Regional Assessment Report on Biodiversity and Ecosystem Services for Europe and Central Asia (2018) also provides insightful finding and recommendations specific to the regional level.

The Triologue brought together more than 70 participants from Azerbaijan and five Central Asia countries—Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan—and resource persons within and outside the region (Annex 1). The jointly reviewed the key messages of the two inter-linked IPBES thematic assessment reports as well as the regional report and assessed their relevance to the ongoing efforts to achieve Sustainable Development Goal (SDG) Target 15.3 of Land Degradation Neutrality (LDN) and other land-related SDG targets.

The three-day event was hosted by the Kazakhstan’s Ministry of Ecology, Geography and Natural Resources (MEGNR) in collaboration with IPBES, the [United Nations Convention to Combat Desertification \(UNCCD\)](#) and the [Coalition of the Willing on Pollinators](#), and with the financial support of the [German Federal Ministry for Environment, Nature Conservation and Nuclear Safety \(BMU\)](#).



**On Day One**, a series of keynote speeches were delivered, including a keynote speech on the linkages between ecosystem health, land degradation and climate change by a renowned global IPBES expert in charge of coordination of the global pollinator assessment. The participants were later immersed into the reality of pollination and pollinators through a 'walkshop' visit to two field sites to get hands-on experience and direct insights from farmers and beekeepers on the roles and status of pollinators, as well as the benefits and challenges for agriculture and land restoration.

**On Day Two**, the participants collaboratively worked on identifying the main drivers of change to pollinators, pollination services and land degradation in their own countries. A TV show-style panel discussion was organized to encourage open, lively and participatory discussions on progress with LDN targets and sustainable land management (SLM) plans, and their contribution to improved ecosystem services in each country. In addition, working group sessions were organized to first showcase existing local examples of 'bright spots' where people are successfully linking pollination services and SLM practices and, second, identify policy and management options to address the risks and opportunities for pollinators as the starting point for co-developing national and regional action plans.

**On Day Three**, a targeted high-level breakfast was organized for the policymakers, donors and development partners to discuss the potential policy actions to be undertaken at regional, national and local levels with reference to the key messages from the IPBES thematic assessments and from the Triologue sessions of the first two days. This was followed by country-based working group sessions aiming to refine the Central Asia National and Regional Action Plans.

Throughout the morning/afternoon break and lunch times of the event, participants were treated to a delicious array of pollinator-themed dishes and beverages, while also learning about each pollinator-dependent ingredient's stories (Annex 3).

Over the three days of intensive programme in Almaty, the Triologue fully achieved its objectives to:

- Assess the trends and drivers of change in the status of land, and the impacts on achieving SDG15.3 and other related targets;
- Assess the latest knowledge of the contributions that unique regional biodiversity and their key ecosystem services provide towards SLM, climate resilience building, agricultural productivity and other sustainable development priorities;
- Review and acknowledge success stories on local community actions contributing to the synergetic achievement of land-biodiversity-climate targets; and
- Identify and agree on practical SLM measures that improve the resilience of ecosystems and their services and contribute to LDN, biodiversity and climate adaptation.

## BES-Net Triologue

The Triologue is a face-to-face dialogue and capacity building methodology promoted by BES-Net that strengthens the culture of dialogue between the three different communities of policy, science and practice for sustainable use of biodiversity and ecosystem services (BES).

BES-Net Triologues bring together academic scientists, policymakers and practitioners with indigenous and local knowledge with similar BES interests into a welcoming and constructive space for dialogue. Three-way interactions help the participants explore and acknowledge divergent knowledge viewpoints, improve inter-cultural understanding and jointly explore the areas of inter-institutional coordination. This leads to the co-development of a common agenda for action.



This Action Document builds on the Background Document that was prepared in the run up to the Regional Trialogue for Central Asia and Azerbaijan through an extensive literature review and a set of semi-structured interviews with key stakeholders in the region. The Background Document tailors and aligns the IPBES Thematic Assessment findings and key messages to the specific regional/national contexts, and compiles available evidence on the status of pollinators, land degradation and key drivers affecting pollinators and policy gaps and opportunities.

The Action Document was developed in a collaborative manner with the proactive engagement of all Trialogue participants. It contributed significantly to enhance the quality of interactions and discussions among the participants during the Trialogue. The strategic national Action Plans on land degradation neutrality, pollinators and food security, outlined in Tables 1-6, were drafted by participants and reviewed within their organizations upon return at their respective countries. These Action Plans are expected to serve as a roadmap for national and regional collaboration towards future awareness raising, knowledge generation, policy reform and on-the-ground practice.



## II. KEY MESSAGES

### Why land degradation matters?

Land plays a crucial role in the national economies of the countries targeted by the Regional Dialogue, namely Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. Agriculture's estimated contribution to Gross Domestic Products (GDP) of the countries ranges from 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.<sup>1</sup>

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).<sup>2</sup>

Land degradation has negative effects on local peoples' health, which may reduce livelihood opportunities and exacerbate 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.<sup>3</sup>

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). 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 among the Regional Dialogue target countries.

Central Asia is one of the regions, which will be most adversely affected by climate change.<sup>5</sup> 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.<sup>6</sup>

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).

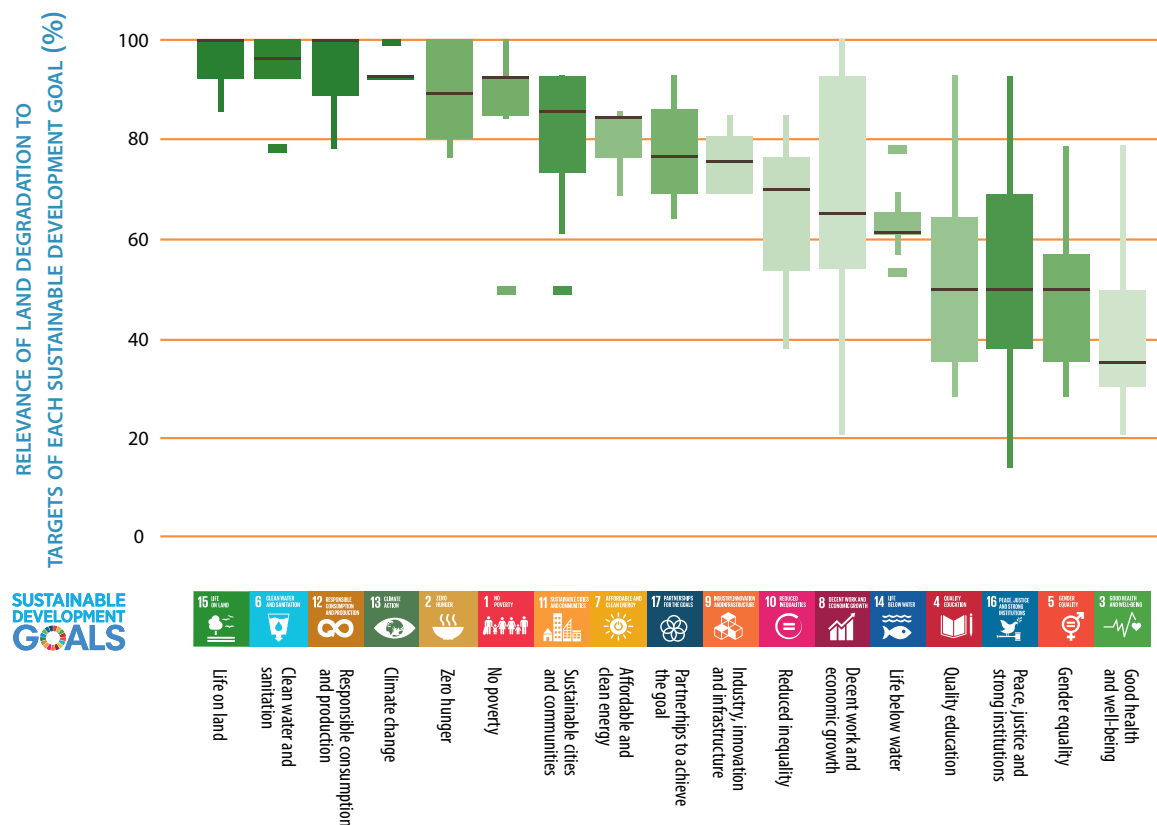
3 ADB (2012). Addressing Climate Change and Migration in Asia and the Pacific. Mandaluyong City, Philippines: Asian Development Bank, 2012.

4 Source: IPBES (2018): Summary for Policymakers of the Assessment Report on Land Degradation and Restoration of the Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services. Bonn, Germany: IPBES secretariat

5 IPCC (2007). IPCC: climate change 2007: impacts, adaptation and vulnerability. Contribution of working group II to the fourth assessment report of the intergovernmental panel on climate change.

6 Reyer, C. P., Otto, I. M., Adams, S., Albrecht, T., Baarsch, F., Cartsburg, M., ... & Mengel, M. (2017). Climate change impacts in Central Asia and their implications for development. *Regional Environmental Change*, 17(6), 1639-1650.

**FIGURE 1: Relevance of land degradation to targets of each SDG<sup>4</sup>**



## Why pollinators/pollination matter?

Globally, nearly 90% of wild flowering plant species depend, at least in part, on the transfer of pollen by animals. Plants are critical for the continued functioning of ecosystems as they provide food, habitats (including for pollinators) and other resources for a wide range of species.<sup>7</sup>

75% percent of the world’s food crops are reported to be dependent, at least in part, on pollination and pollinator-dependent crops contribute to 35% of global crop production volume. This means that one in every three mouthfuls of food are pollinator dependent.<sup>8</sup> Importantly, the area of pollinator-dependent crops has increased disproportionately compared to other crops, and the trend is more pronounced in developing countries. About 14% of total agricultural crop output in Central Asia is dependent on pollination services<sup>9</sup>, 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.

<sup>7</sup> IPBES (2016). Thematic Assessment Report on Pollinators, Pollination and Food Production.

<sup>8</sup> Ibid

<sup>9</sup> 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 and pollinator decline are interlinked. Unsustainable intensification of agriculture is a driver of both land degradation and pollinator decline. Pollinators are essential to increase the 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.

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 IPBES Thematic Assessment Report on Pollinators, Pollination and Food Production (2016) identifies Central Asia as one of the top three most vulnerable areas to pollination service loss (p. 419). It also reports 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.<sup>10</sup>

Central Asia is expected to be one of the most severely affected regions by climate change.<sup>11</sup> 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. 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.

<sup>10</sup> IPBES (2016). Thematic Assessment Report on Pollinators, Pollination and Food Production.

<sup>11</sup> IPCC (2007). IPCC: climate change 2007: impacts, adaptation and vulnerability. Contribution of working group II to the fourth assessment report of the intergovernmental panel on climate change.



### III. STRATEGIC NATIONAL ACTIONS TO ADDRESS THE PROBLEM

During the Regional Trialogue for Central Asia and Azerbaijan, the participants undertook a series of working group exercises to identify and collectively agree on the strategic and context-relevant actions to tackle the inter-linked challenges of land degradation, pollinators and food security at subnational levels (Tables 1-6). The IPBES assessment action plan format was adopted to organize the respective strategic policy, science and practice actions and targets. Each action is expected to address the threats to pollinators in a way that enhances food security.

**TABLE 1: National actions on land degradation neutrality, pollinators and food security in Azerbaijan**

Ambition	Strategy	Action	Regional	National/Local	Responsible/ Champion from the group who will push this forward	Collaborating Organisation(s)	Date for first output
Transform the relationship between society and nature	Learn from others, gather data, Integrate knowledge and diverse values in management	Place information on pollinators on the electronic portal of the Ministry of Agriculture and the Ministry of Ecology and Natural Resources of the Republic of Azerbaijan		X	Ministry of Agriculture of the Republic of Azerbaijan; Ministry of Ecology and Natural Resources; Azerbaijan Beekeepers Association	Research institutes NGOs	1 year
	Link people and pollinators through collaborative, cross-sectoral collaboration	Coordinate stakeholders (beekeepers, farmers and gardeners) at the national level		X	Ministry of Agriculture of the Republic of Azerbaijan; Azerbaijan Beekeepers Association	Farmers and beekeepers	2 years
	Educate & raise awareness	Include educational information on pollinators in the education systems of schools and Universities  Publish manuals and guidelines for beekeepers  Organize honey fairs and exhibitions and promote bee products production  Create short videos about pollinators  Organize summer schools for students		X	Ministry of Education of the Republic of Azerbaijan; Ministry of Agriculture of the Republic of Azerbaijan Azerbaijan State Agrarian University	NGOs; International organizations; Agrarian Science Center under the Ministry of Agriculture of the Republic of Azerbaijan	2 years



**TABLE 1 (CONTINUED): National actions on land degradation neutrality, pollinators and food security in Azerbaijan**

Ambition	Strategy	Action	Regional	National/ Local	Responsible/ Champion from the group who will push this forward	Collaborating Organisation(s)	Date for first output	
<b>Markets</b>		Make new products from honey (candies, dry honey); Use honey as a raw material in the food industry; Create an attractive market for beekeepers		X	Customs control for foreign goods			
		Identify problems by investigating the current situation with pollinators in the field; Develop strategies at the national level; Implement preventive measures in the regions simultaneously; Join the coalition; Create a database with access for all the stakeholders; Increase the use of biological means for pollinators protection Beekeepers admission to protected areas Work with gardeners to attract bees to garden farms	X	X	Ministry of Agriculture of the Republic of Azerbaijan; Ministry of Ecology and Natural Resources	Agrarian Science Center under the Ministry of Agriculture of the Republic of Azerbaijan; Farmers	On a permanent basis	
	<b>Enhance resilience</b>	Provide access to information on biological protection of pollinators; Prepare and organize trainings for farmers on reduction of chemicals usage and the introduction of biological methods		X	Ministry of Agriculture of the Republic of Azerbaijan; Ministry of Ecology and Natural Resources	Agrarian Science Center under the Ministry of Agriculture of the Republic of Azerbaijan	2 years	
	<b>Capitalize on immediate opportunities</b>	Coordinate work between beekeepers and other sectors of agriculture for creation of the melliferous base			X	Ministry of Agriculture of the Republic of Azerbaijan	Agrarian Science Center under the Ministry of Agriculture of the Republic of Azerbaijan Farms	2 years
		Use nectariferous plants in greening the cities			X	Ministry of Agriculture of the Republic of Azerbaijan; Ministry of Ecology and Natural Resources; Azerbaijan Beekeepers Association	Local Executive authorities; Department for cities and districts greening	On a permanent basis



**TABLE 1 (CONTINUED): National actions on land degradation neutrality, pollinators and food security in Azerbaijan**

Ambition	Strategy	Action	Regional	National/ Local	Responsible/ Champion from the group who will push this forward	Collaborating Organisation(s)	Date for first output
<b>Transform agricultural landscapes</b>	<b>Ecologically intensify agriculture through active management of ecosystem services<sup>12</sup></b>	Improve legal framework on environmental agriculture and ecosystem services;  Create National Advisory Council on beekeeping and other pollinators;  Create special areas for bees (for example, create alfalfa fields for beekeeping purposes)		X	Ministry of Agriculture of the Republic of Azerbaijan;  Ministry of Ecology and Natural Resources;  Ministry of Economy of the Republic of Azerbaijan;  The Parliament of the Republic of Azerbaijan;  NGO	NGOs; Azerbaijan Beekeepers Association	On a permanent basis
	<b>Strengthen existing diversified farming systems</b>	Combat land degradation desertification and salinity; Introduce of innovative technologies and water-saving irrigation system;  Develop and introduce a monitoring system for pollinators		X	Ministry of Agriculture of the Republic of Azerbaijan;  Ministry of Ecology and Natural Resources	NGOs; International organizations; Associations of farmers	On a permanent basis
		Create pastures for stationary cattle breeding		X	Ministry of Agriculture of the Republic of Azerbaijan;  Ministry of Ecology and Natural Resources	Associations of farmers	3 years
	<b>Invest in ecological infrastructure</b>	Develop eco-tourism and agritourism;  Promote public and private investment into the country's environmental infrastructure;  Raise awareness among population in order to increase the demand for honey;  Create videos		X	Ministry of Agriculture of the Republic of Azerbaijan;  Ministry of Ecology and Natural Resources;  Ministry of Economy of the Republic of Azerbaijan;  Ministry of Finance of the Republic of Azerbaijan	International financial institutions Farms	On a permanent basis

<sup>12</sup> Ecological intensification may be formally defined as a knowledge-intensive process that requires optimal management of nature's ecological functions and biodiversity to improve agricultural system performance, efficiency and farmers' livelihoods, [www.fao.org/agriculture/crops/thematic-sitemap/theme/biodiversity/ecological-intensification/en](http://www.fao.org/agriculture/crops/thematic-sitemap/theme/biodiversity/ecological-intensification/en).



**TABLE 2: National actions on land degradation neutrality, pollinators and food security in Kazakhstan**

Ambition	Strategy	Action	Regional	National/ Local	Responsible/ Champion from the group who will push this forward	Collaborating Organisation(s)	Date for first output
<b>Transform the relationship between society and nature</b>	<b>Learn from others, gather data, Integrate knowledge and diverse values in management</b>	Publish research and practice results on pollination, land degradation and climate change issues	X	X	Research institutes	Universities; NGOs; government; farmers	Annually
		Create a unified information and analytics platform on pollination, pesticide use and preventing land degradation	X	X	Research institutes	NGOs; Government	Within 2020
		Establish Coalition for Pollinators Conservation in Central Asia		X	NGOs	Research institutes; Farmers; Government	Within 1 year
		Integrate pollinator issues in related disciplines (pasture and forest management, agricultural crops, etc.); Develop and implement industry standards		X	NGOs	Government	Within 3 years
	<b>Link people and pollinators through collaborative, cross-sectoral collaboration</b>	Include pollinators in current land degradation projects and programmes	X	X	Government	Research institutes; Universities; NGOs; farmers	3-5 years
		Environmental business projects and start-ups competition	X	X	Government; NGOs	Research institutes; Universities; NGOs; Farmers	Annually within a year
		Bring together researchers, NGOs and producers Create model farms		X	Government; NGOs; Farmers	Research institutes; Farmers	3-5 years
		Establish REC for knowledge sharing		X	Government	Research institutes; Universities; NGOs; Farmers	2-Jan
		Develop open educational resources on pollination		X	Government	Research institutes; Universities; NGOs; Farmers	3-Feb
	<b>Educate &amp; raise awareness</b>	Participate in international workshops and trainings	X	X	IPBES	Government; Research institutes; Universities; NGOs	Regularly
		Launch training for agricultural producers		X	Government; NGOs	Universities; NGOs; Research institutes	Regularly
		Conduct PR campaigns: Print posters, make demonstration plots		X	Government	Universities; Media Research institutes	Regularly
		Engage media covering pollinator and land degradation issues		X	Government; NGOs	Universities; NGOs; Research institutes	Regularly
		Organize fairs; Organize public events to mark World Bee Day (May 20)		X	NGOs; Farmers	Universities, NGOs research institutes	Regularly
		Develop and launch open educational resources on pollination		X	NGOs; IPBES; UNDP	Government; NGOs; Research institutes; Universities	2-Jan
		Hold small grants competition for pollinator and land degradation projects		X	Government; State farmers	Universities; Research institutes	Regularly within a year
		Special labelling for pollination products		X	Research institutes; Government	Research institutes; Universities; NGOs	Regularly
		Lifelong education in the sphere of pollination and land degradation (trainings and extension programmes)		X	Government; NGOs Research institutes	Research institutes; Universities; NGOs	Regularly
		Access to information on biological pollinator protection		X	Government	NGOs; Research institutes; Media	Regularly
		Develop and create video materials on pollinator protection and land degradation issues and their distribution in social networks and media		X	Government; NGOs; Research institutes	NGOs; Research institutes; Media	Within a year

TABLE 2 (CONTINUED): National actions on land degradation neutrality, pollinators and food security in Kazakhstan

Improving current conditions for pollinators and/or maintaining pollination	Manage immediate risks	Study pollination and land degradation problems		X	Research institutes	Universities, NGOS Research institutes	3-Feb
		Enhance phytosanitary control of chemicals and biomaterials import		X	Government	Research institutes	regularly
		Implement pollinator conservation and land rehabilitation programmes		X	Government	Research institutes, universities, NGOs	3-Feb
	Enhance resilience	Improve the regulatory framework related to pollination, land degradation and climate change taking into consideration regional experience		X	Government	NGOs, society	3-Feb
		Work on breeding in beekeeping (bees adaptation to climate change)		X	Research institutes, universities	NGOs, farmers	3-Feb
		Promote organic products on local markets	X	X	Government	NGO, farmers	Regularly
		Stimulate manufacturers to produce ecological products		X	Government		within a year
		Provide subsidies and reduce tax burden on beekeeping agricultural enterprises		X	Government	NGOs	3-Feb
	Capitalize on immediate opportunities	Introduce biological methods of combating diseases and pests		X	Government; Research institutes	Universities; NGOs; Farmers	2-Jan
		Develop and implement standards for pollination products labelling		X	Research institutes	NGOs	3-Feb
Transform agricultural landscapes	Ecologically intensify agriculture through active management of ecosystem services <sup>13</sup>	X	X	Government	NGOs	2-Jan	
	Strengthen existing diversified farming systems	Increase melliferous plants territory		X	Government	Research institutes; NGOs; The forestry committee	Regularly
		Expand special protected natural areas		X	Government	Research institutes; NGOs; The forestry committee	3-Feb
		Enhance phytosanitary control of chemicals and biomaterials import		X	Government	Research institutes; NGOs; SEZs	Within a year
	Invest in ecological infrastructure	Develop eco- and agro- tourism		X	Government	Research institutes; Entrepreneurs; The forestry committee	2-3
		Create and organize melliferous plant nurseries		X	Government	Research institutes; NGOs; Farmers	2-3
Select based on breeding apiaries			X	Research institutes	NGOs; Farmers	Regularly	

<sup>13</sup> Ecological intensification may be formally defined as a knowledge-intensive process that requires optimal management of nature's ecological functions and biodiversity to improve agricultural system performance, efficiency and farmers' livelihoods. [www.fao.org/agriculture/crops/thematic-sitemap/theme/biodiversity/ecological-intensification/en](http://www.fao.org/agriculture/crops/thematic-sitemap/theme/biodiversity/ecological-intensification/en).



**TABLE 3: National actions on land degradation neutrality, pollinators and food security in Kyrgyzstan**

Ambition	Strategy	Action	Regional	National/Local	Responsible/ Champion from the group who will push this forward	Collaborating Organisation(s)	Date for first output
<b>Transform the relationship between society and nature</b>	Learn from others, gather data, Integrate knowledge and diverse values in management	Organize a national conference on pollinations issues convening all major stakeholders: state bodies, beekeepers, academy, associations of resources users, tourism operators, local population		X	Ministry of Agriculture; State Agency on Environment	IPBES; UNDP; UNEP; GIZ	Mar-20
		Conduct a survey among pollinator-related groups on current status and issues of pollinators		X	Ministry of Agriculture	IPBES; UNDP; UNEP; GIZ	Dec-20
	Ensure connections between people and pollinators through collaborative, cross-sectoral collaboration	Establish an association on pollination		X	Ministry of Agriculture ; State Agency on Environment	IPBES; UNDP; UNEP; GIZ	Dec-20
	Educate & raise awareness	Design and implement a media campaign (including SMM segment) on importance of pollination		X	Ministry of Agriculture and State Agency on Environment	IPBES; UNDP; UNEP; GIZ	May-20
<b>Improving current conditions for pollinators and/or maintaining pollination</b>	Manage immediate risks	Identify most dangerous and safe pesticides/herbicides for pollinators		X	Ministry of Agriculture; State Agency on Environment; Academia	IPBES; UNDP; UNEP; GIZ	Nov-20
		Develop recommendation for farmers and resource-users		X	Ministry of Agriculture, State Agency on Environment, Academia	IPBES; UNDP; UNEP; GIZ	Dec-20
	Enhance resilience	Develop/enhance legislative documents on pollinators		X	Ministry of Agriculture; State Agency on Environment, relevant associations	IPBES; UNDP; UNEP; GIZ	Dec-20
	Capitalize on immediate opportunities	Develop/join initiatives on pollination in Central Asia and Kyrgyzstan	X	X	Ministry of Agriculture; State Agency on Environment	IPBES; UNDP; UNEP; GIZ	Dec-20
<b>Transform agricultural landscapes</b>	Greening agriculture through active regulation of ecosystem services <sup>14</sup>	Promote and support organic agriculture initiatives	X	X	Ministry of Agriculture; State Agency on Environment	IPBES; UNDP; UNEP; GIZ	Dec-20
	Strengthen existing diversified farming systems	Encourage effective integration of bee-keeping units into relevant agricultural activities		X	Ministry of Agriculture; State Agency on Environment; Associations	IPBES; UNDP; UNEP; GIZ	Dec-20
	Invest in ecological infrastructure	Research on most resilient breeds of bees and other pollinators		National	Ministry of Agriculture; State Agency on Environment; Associations; Academy	IPBES; UNDP; UNEP; GIZ	Dec-20

<sup>14</sup> Ecological intensification may be formally defined as a knowledge-intensive process that requires optimal management of nature's ecological functions and biodiversity to improve agricultural system performance, efficiency and farmers' livelihoods, [www.fao.org/agriculture/crops/thematic-sitemap/theme/biodiversity/ecological-intensification/en](http://www.fao.org/agriculture/crops/thematic-sitemap/theme/biodiversity/ecological-intensification/en).

**TABLE 4: National actions on land degradation neutrality, pollinators and food security in Tajikistan**

Ambition	Strategy	Action	Regional	National/ Local	Responsible/ Champion from the group who will push this forward	Collaborating Organisation(s)	Date for first output
<b>Transform the relationship between society and nature</b>	Learn from others, gather data, Integrate knowledge and diverse values in management	Include pollinators into educational programs of schools and universities		X	Ministry of Education and Science of the Republic of Tajikistan	Academy of Sciences of the Republic of Tajikistan	20.09.2020
	Link people and pollinators through collaborative, cross-sectoral collaboration	Develop and implement trainings for farmers in order to reduce the use of chemicals and to introduce the biological methods of combating crops pests		X	Ministry of Agriculture of the Republic of Tajikistan	Agricultural University of Tajikistan (Tajik Agrarian University)	10.09.2020
<b>Improving current conditions for pollinators and/or maintaining pollination</b>	Enhance resilience	Distribute information about food security and the role of pollinators in nature through handouts, scientific articles, media and radio Become a member of the pollinators' coalition Use data and methodology on pollinators available internationally	X	X	Committee for Environment Protection under the Government of the Republic of Tajikistan; Government of the Republic of Tajikistan Ministry of Agriculture of the Republic of Tajikistan	National Biodiversity and Biosafety Centre Committee for Environmental Protection under the Government of the Republic of Tajikistan; UNDP	10.02.2020 1.03.20020
<b>Transform agricultural landscapes</b>	Ecologically intensify agriculture through active management of ecosystem services <sup>15</sup>	Establish cooperation between beekeepers, farmers and Research Institutes		X	Academy of Agricultural Sciences of Tajikistan; Ministry of Agriculture of the Republic of Tajikistan	Academy of Sciences of the Republic of Tajikistan	15.03.2020
	Strengthen existing diversified farming systems	Create database and provide access to all stakeholders		X	Academy of Agricultural Sciences of Tajikistan	National Biodiversity and Biosafety Center	20.03.2020
		Work on breeding in beekeeping		X	Ministry of Agriculture of the Republic of Tajikistan; Academy of Agricultural Sciences of Tajikistan;	Committee for Environmental Protection under the Government of the Republic of Tajikistan	12.04.2020
		Organize honey festivals and fairs in all regions of the Republic	X	X	Ministry of Agriculture of the Republic of Tajikistan; Government of the Republic of Tajikistan	Research institutes of Central Asia	25.05.2020
	Engage university students in research on pollinators	X	X	Ministry of Education and Science of the Republic of Tajikistan; Academy of Sciences of the Republic of Tajikistan	Ministry of Agriculture of the Republic of Tajikistan; Foreign Research institutes	15.06.2020	

<sup>15</sup> Ecological intensification may be formally defined as a knowledge-intensive process that requires optimal management of nature's ecological functions and biodiversity to improve agricultural system performance, efficiency and farmers' livelihoods, [www.fao.org/agriculture/crops/thematic-sitemap/theme/biodiversity/ecological-intensification/en](http://www.fao.org/agriculture/crops/thematic-sitemap/theme/biodiversity/ecological-intensification/en).

**TABLE 5: National actions on land degradation neutrality, pollinators and food security in Turkmenistan**

Ambition	Strategy	Action	Regional	National/Local	Responsible/Champion from the group who will push this forward	Collaborating Organisation(s)	Date for first output
<b>Transform the relationship between society and nature</b>	<b>Learn from others, gather data, Integrate knowledge and diverse values in management</b>	Share international experience; Expand the knowledge base and primary sources; Raise stakeholder awareness; Assess the situation and needs	X	X	Ministry of Agriculture and Environment Protection of Turkmenistan	CAREC in TM	One year
	<b>Link people and pollinators through collaborative, cross-sectoral collaboration</b>	Establish strategic plans for beekeeping development together with other sectors of agriculture; Support research on the impact of pollinators on crop yields; Conduct pilot projects on the impact of pollinators on ecosystems strengthening; Prepare project proposals for international donors on the use of pollinators in agriculture		X	Ministry of Agriculture and Environment Protection of Turkmenistan; Ministry of economy and development of Turkmenistan; National Institute of deserts, flora and fauna	CAREC in TM; Scientific information center (SIC) ISCD	2-3 years
	<b>Educate &amp; raise awareness</b>	Organize workshops, trainings and dialogue platforms on the use of pollinators for agricultural development, ecosystems conservation and strengthening; Organize a national conference on the use of pollinators in agriculture with the invitation of an international expert. Develop and introduce training materials into educational programs on the role of pollinators in the development of agriculture; Develop information materials to raise public awareness on the use of pollinators (videos)		X	Ministry of Agriculture and Environment Protection of Turkmenistan; Ministry of economy and development of Turkmenistan; National Institute of deserts, flora and fauna	CAREC in TM Scientific information center (SIC) ISCD	1 year
<b>Improving current conditions for pollinators and/or maintaining pollination</b>	<b>Manage immediate risks</b>	Create an operational notification service for beekeepers, beekeepers database and SMS notifications for them; Create an information portal for beekeepers; Exchange experience and practices (workshops, trainings, conferences, forums); Improve the regulatory framework on administrative penalties for violations of land management; Create a list of quarantine nectariferous plants; Improve the skills of beekeepers, organize trainings on beekeeping for specialized personnel and veterinarians; Open certified laboratories for honey and beekeeping products quality control.		X	Ministry of Agriculture and Environment Protection of Turkmenistan; Ministry of economy and development of Turkmenistan; National Institute of deserts, flora and fauna	CAREC in TM Scientific information center (SIC) ISCD	2-3 years

**TABLE 5 (CONTINUED): National actions on land degradation neutrality, pollinators and food security in Turkmenistan**

Ambition	Strategy	Action	Regional	National/ Local	Responsible/ Champion from the group who will push this forward	Collaborating Organisation(s)	Date for first output
Transform agricultural landscapes	Ecologically intensify agriculture through active management of ecosystem services <sup>16</sup>	Develop a program for long-term development of beekeeping; Stimulate scientific research in the use of pollinators, their reproduction, technology development and appropriate state support; Introduce insurance for beekeepers; Monitor farmland for pesticide and heavy metal residues, regional monitoring		X			
	Strengthen existing diversified farming systems	Develop a methodology for the use of pollinators in agricultural production		X			
		Introduce the use of pollinators into the practice of agriculture in order to increase crop yields		X			
Invest in ecological infrastructure		Create preferential treatment for the development of beekeeping, concessional loans, credit, subsidy.		X			

<sup>16</sup> Ecological intensification may be formally defined as a knowledge-intensive process that requires optimal management of nature's ecological functions and biodiversity to improve agricultural system performance, efficiency and farmers' livelihoods, [www.fao.org/agriculture/crops/thematic-sitemap/theme/biodiversity/ecological-intensification/en](http://www.fao.org/agriculture/crops/thematic-sitemap/theme/biodiversity/ecological-intensification/en).





**TABLE 6: National actions on land degradation neutrality, pollinators and food security in Uzbekistan**

Ambition	Strategy	Action	Regional	National/ Local	Responsible/ Champion from the group who will push this forward	Collaborating Organisation(s)	Date for first output	
<b>Transform the relationship between society and nature</b>	Learn from others, gather data, integrate knowledge and diverse values in management	Join IPBES ; BES-Net Coalition	X		Prepare analytical reports and feasibility studies for joining the network for decision-makers – National Committee (designated person Abduvakhid Zakhadullaev- State Committee of Forestry)	Participating subordinate organizations Beekeepers Association; Biodiversity International; International Innovation Center for the Aral Sea Basin NGO KRASS	2020	
		Establish Coalition for Pollinators Conservation in Central Asia	X	X	?	?	2021	
		Study pollinator and land degradation problems at the regional level	X			Established National Committee and collaborating organizations	Arachnology Institute Universities; Ministry of Agriculture; State Environmental Committee; State Forestry Committee; Beekeepers Association to provide office space (for rent)	Preparation of the grant project proposal – 2020; Field research - 2020
		Organize a research and practice conference on pollinators and present the concept			X	National Committee (platform) under the Government the Cabinet	Biodiversity International; Academy of Sciences of the Republic of Uzbekistan and participating organizations; Research institutes; Universities; UNDP Uzbekistan; Beekeepers association; International Innovation Center for the Aral Sea Basin; NGO KRASS	
		Hold kick-off workshops and meetings with individual stakeholders and organizations for planning and setting the conference goals, preparation activities, collecting data, discussing organizational issues				X		Opening workshop December 2019 (Honey fair - Suyarkulov); Kick-off workshop - invite representatives of participating and interested ministries and agencies (Ministry of Agriculture, farmers and household councils, Agricultural Chemistry, State Environmental Committee, Ministry of Water Administration, etc.)

**TABLE 6 (CONTINUED): National actions on land degradation neutrality, pollinators and food security in Uzbekistan**

Ambition	Strategy	Action	Regional	National/ Local	Responsible/ Champion from the group who will push this forward	Collaborating Organisation(s)	Date for first output	
<b>Transform the relationship between society and nature</b>	<b>Learn from others, gather data, Integrate knowledge and diverse values in management</b>	Prepare and promote project proposals on pollinators conservation, land degradation and biodiversity conservation; present to the donor community (accredited in the Republic of Uzbekistan)		X		Academy of Sciences of the Republic of Uzbekistan and participating organizations; Research institutes; Universities; UNDP Uzbekistan; Beekeepers Association; International Innovation Center for the Aral Sea Basin; Biodiversity International		
		Organize PR campaigns		X	Mukhabbat Turdiveva – posters creation and production			
		Combine honey fairs with PR campaigns at the regional level	X		Beekeepers Association Sherali Suyarkulov Republican fair on the role of pollinators in ensuring food security (a workshop, creation and production of information and educational materials, e.g. posters, brochures) Regional honey festival in all regions to raise awareness of the population		1-10 December 2019 Tashkent	
	<b>Link people and pollinators through collaborative, cross-sectoral collaboration</b>	Launch a unified platform (committee) on pollinators in order to bring together experts (beekeepers, entomologists, etc.)	X	X	State Environmental Committee (biodiversity focal point) and the Ecological Movement of Uzbekistan	State Forestry Committee; Ministry of Agriculture; Beekeepers Association	Jan-20	
	<b>Educate &amp; raise awareness</b>	Mark World Bee Day on May 20 and national bee and other pollinators day, International Biodiversity Day, organize a press club			X	National Committee (platform) under the Government (the Cabinet)	Beekeepers Association; Sh. Suyarkulov (eco action); State Forestry Committee; State Environmental Committee; UNDP Uzbekistan; NGO KRASS; International Innovation Center for the Aral Sea Basin	
		Develop training programmes and provide consulting for farmers						

TABLE 6 (CONTINUED): National actions on land degradation neutrality, pollinators and food security in Uzbekistan

Ambition	Strategy	Action	Regional	National/ Local	Responsible/ Champion from the group who will push this forward	Collaborating Organisation(s)	Date for first output
Improving current conditions for pollinators and/or maintaining pollination	Manage immediate risks	Study the impact of honeybees, wild and other pollinators on food security and biodiversity conservation; Work is in progress on bees (improvement of the species composition) Advancement of technological methods; Establishment of a group of beekeeping instructors in colleges and a training program for colleges and universities on the initiative of the Association of Beekeepers; Collect and summarize the available information and research data and identify the areas of work and rehabilitation		X	Appoint a responsible person on a routine basis (Oybek Samakov?)	Arachnology Institute	
	Capitalize on immediate opportunities	Include in current project development programmes and government programmes (e.g. the state programme on protective afforestation and afforestation of the dried bottom of the Aral Sea)			International Innovation Center of the Aral Sea Basin		
Transform agricultural landscapes	Ecologically intensify agriculture through active management of ecosystem services <sup>17</sup>	Develop projects and programmes Rehabilitate degraded landscapes Protect pollinators habitat		X			
	Invest in ecological infrastructure	Establish mobile laboratories for monitoring of the degraded ecosystems rehabilitation (salt and drought resistant crops)		X			

<sup>17</sup> Ecological intensification may be formally defined as a knowledge-intensive process that requires optimal management of nature's ecological functions and biodiversity to improve agricultural system performance, efficiency and farmers' livelihoods. [www.fao.org/agriculture/crops/thematic-sitemap/theme/biodiversity/ecological-intensification/en](http://www.fao.org/agriculture/crops/thematic-sitemap/theme/biodiversity/ecological-intensification/en).







# IV. DESCRIPTION OF LAND DEGRADATION, CLIMATE CHANGE AND POLLINATION NEXUS AT NATIONAL LEVEL

## AZERBAIJAN

### Land Degradation

About 36% of land in Azerbaijan (29,888 km<sup>2</sup>) appears degraded, including 34% of croplands and 8% of forested areas.<sup>18</sup> About 34% of arable lands on mountain slopes is prone to soil erosion and loss of fertility.<sup>19</sup> According to the Ministry of Agriculture, 40% of 8.5 million ha of land in the country is degraded with about 20.7% being extremely degraded.<sup>20</sup> One million ha of 1.6 million ha of arable land in Azerbaijan are susceptible to degradation.<sup>21</sup> Greatest degradation by area is documented in Ordubad (93.4%), Culfa (90%), Obshron (86.0%), Xizi (80.4%) and Qobustan districts (76.5%). The main drivers of land degradation are unsustainable land management practices, such as excessive tilling on mountain slopes, water and wind erosion, salinization (Table 7), overgrazing and extractive industries. Azerbaijan has been working on setting voluntary LDN targets.

**TABLE 7: Districts most severely affected by soil salinization in Azerbaijan<sup>22</sup>**

District	Total area in ha	% of total area affected by salinization	Degree of soil salinization				
			low	medium	high	Extremely high	Entirely saline
Salyan	160253	75%	9%	13%	21%	21%	11%
Absheron	227406	68%	20%	15%	20%	10%	3%
Bilesuvar	138478	67%	13%	13%	21%	14%	6%
Ucar	83398	62%	9%	20%	22%	9%	2%
Zerdab	87670	61%	12%	18%	16%	8%	7%

### 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 from 1990 baseline.<sup>23</sup> 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 2).<sup>24</sup>

18 Le et al., 2014. Biomass productivity-based mapping of global land degradation hotspots. ZEF Discussion Papers on Development Policy, No. 193

19 Salimov R., Mammadov, G. (2018). 2018. Agriculture of Azerbaijan. Statistical yearbook.

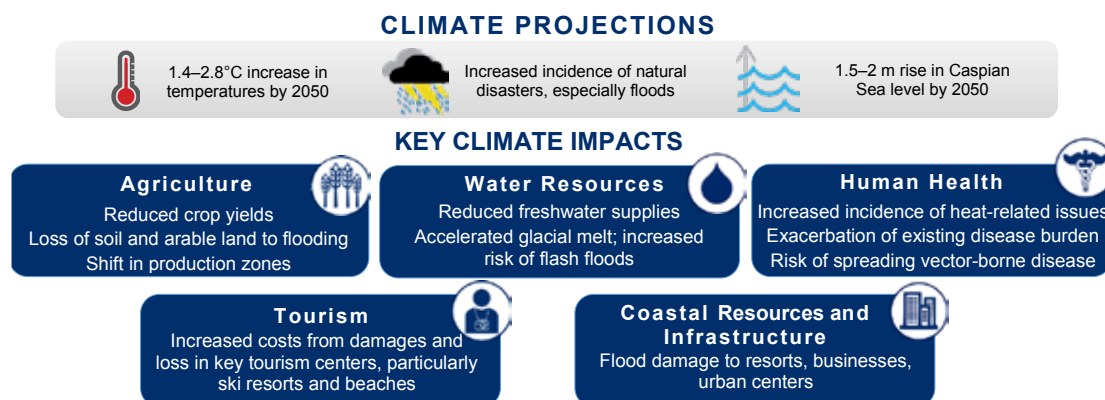
20 Ministry of Agriculture of Azerbaijan, 2019. Aliev and Aliev (2000) reported that 41.8% are degraded.

21 Ministry of Agriculture of Azerbaijan, 2019.

22 Ministry of Agriculture of Azerbaijan, 2019.

23 Zoi Environmental Network. (2018). Azerbaijan. URL: <https://zoinet.org/wp-content/uploads/2018/02/CC-Azerbaijan-EN.pdf>.

24 USAID. (2017). Climate Change Risk Profile Azerbaijan. URL: [https://www.climatelinks.org/sites/default/files/asset/document/2017\\_USAID\\_Climate%20Change%20Risk%20Profile\\_Azerbaijan.pdf](https://www.climatelinks.org/sites/default/files/asset/document/2017_USAID_Climate%20Change%20Risk%20Profile_Azerbaijan.pdf)

**FIGURE 2: Overview of Climate Projections and Key Climate Impacts in Azerbaijan<sup>25</sup>**

Source: climatlinks.org

## 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.<sup>26</sup> During the Soviet era, Azerbaijan was a major honey producer breeding Caucasian honeybee (*Apis mellifera caucasia*). However, in 1980s a parasite outbreak decimated the Caucasian honeybee population. A southern subspecies of the Caucasian honeybee was used to restore the bee population, however the hybrid bees proved to be less productive. In 2019, some 501,000 beehives in Azerbaijan produced about 5,000 tons of honey. The average price for 1 kg of honey is US\$ 8-12. In 2018, 8.3 tons of honey were exported primarily to Japan.

Several export crops of Azerbaijan, such as pomegranates, oranges, watermelons, and tomatoes are highly dependent on pollinators (Table 8). 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 8: Selected top export crops for Azerbaijan<sup>27</sup> and their level of dependence on pollinators<sup>28</sup>**

Crop	Export value US\$1,000	Dependence on pollinators <sup>28</sup>
Vegetable oil <sup>29</sup>	109,445.5	Unclear
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

<sup>25</sup> Source: climatlinks.org

<sup>26</sup> Aliyev B., Guseinova S. (2017). Evaluation of the influence of natural and anthropogenic factors on desertification of the Absheron peninsula in Azerbaijan Republic. Gazakh branch of Baku State University, Azerbaijan Republic, Gazakh City.

<sup>27</sup> <https://www.stat.gov.az> (Data for 2018. The Foreign Trade of Azerbaijan. Yearbook 2019).

<sup>28</sup> he dependence is identified as essential, great, moderate, little, increase reproduction or no dependence based on [http://www.fao.org/fleadmin/user\\_upload/pollination/docs/POLLINATION\\_VALUE\\_ARRAY.xls](http://www.fao.org/fleadmin/user_upload/pollination/docs/POLLINATION_VALUE_ARRAY.xls)

<sup>29</sup> 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.<sup>30</sup> About 60% of land in Kazakhstan (1,619,584 km<sup>2</sup>) is degraded, including 57% of croplands, 21% of forested areas and 38% of grasslands.<sup>31</sup> 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.<sup>32</sup> Almaty, Atyrau and Turkestan regions of Kazakhstan are among the most vulnerable to land degradation with more than 30% of land being degraded to various extent (Figure 3)<sup>33</sup>. Main drivers of land degradation are wind and water erosion, salinization, waterlogging and industrial pollution of soils. For example, about 5 million ha in Almaty region, 3.1 million ha in Atyrau region, 3.1 million ha in Turkestan region and 2.8 million ha in Qyzylorda region are susceptible to wind erosion.<sup>34</sup> Water erosion affects more than 4.9 million ha across the country.<sup>35</sup> Some estimates suggest that that the cost of desertification in Kazakhstan is as high as US\$ 6.2 billion<sup>36</sup>, whereas most recent study of annual costs of land degradation estimates it to be US\$ 3.06 billion (US\$ 1,782 per capita).<sup>37</sup>

Animal breeding is one of the key elements of local livelihoods in Kazakhstan. As of January 2019, there are over 7 million cattle, over 2.3 million horses and more than 18 million sheep. Around two-third of Kazakhstan's national territory is potential pastureland. 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.<sup>38</sup> 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<sup>39</sup>. 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 include: i) inclusion of fallow and abandoned lands in the turnover; and ii) 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.

**FIGURE 3: Land degradation in Kazakhstan<sup>40</sup>**



30 WBG (2012). World Bank. Activating drought. Management assessment and mitigation for Central Asia and the Caucasus. The World Bank Europe and Central Asia, Office of sustainable environmental and social development

31 Le et al., 2014. Biomass productivity-based mapping of global land degradation hotspots. ZEF Discussion Papers on Development Policy, No. 193

32 Pender, J., Mirzabaev, A., & Kato, E. (2009). Economic analysis of sustainable land management options in Central Asia (Vol. 168). Final report for the ADB. IFPRI/ICARDA.

33 Annual land use report of the Ministry of Agriculture of Kazakhstan, 2018.

34 Annual land use report of the Ministry of Agriculture of Kazakhstan, 2018.

35 Annual land use report of the Ministry of Agriculture of Kazakhstan, 2018.

36 Saigal, S. (2003). Kazakhstan: Issues and approaches to combat desertification. ADB and the Global Mechanism

37 Mirzabaev, A., Goedecke, J., Dubovyk, O., Djanibekov, U., Le, Q. B., & Aw-Hassan, A. (2016). Economics of land degradation in Central Asia. In Economics of land degradation and improvement—A global assessment for sustainable development (pp. 261-290). Springer, Cham.

38 GTZ (2007). Acting locally - cooperating regionally. Combating desertification in Central Asia. Regional Project to Support UNCCD Implementation in Central Asia.

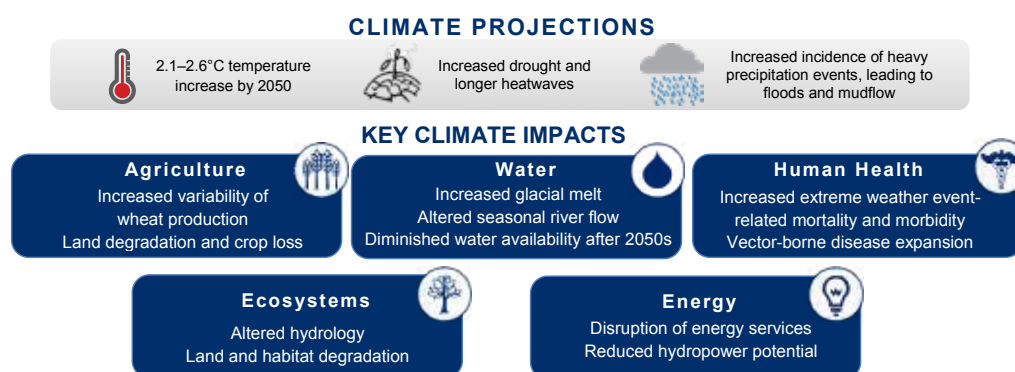
39 See Annex 4

40 Adapted from the Annual land use report of the Ministry of Agriculture of Kazakhstan, 2018, p. 139.

## 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 from 1990 baseline by 2030. With an international support including technology transfer and favorable economic conditions, Kazakhstan can reduce emission by 25-34% between 2021 and 2030.<sup>41</sup> 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 4).<sup>42</sup>

**FIGURE 4: Overview of Climate Projections and Key Climate Impacts in Kazakhstan<sup>43</sup>**



## 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 honeybees (*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.<sup>44</sup> 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 honeybees (*Apis mellifera*) and bumblebee have been documented as the most effective pollinators for forage crops.<sup>45</sup> 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.<sup>46</sup> 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 various extent (Table 9).

41 CAREC (2018). Обзор по исполнению международных экологических конвенций в Центральной Азии. РЭЦЦА.

42 CAREC (2011). Анализ деятельности в области адаптации к изменению климата в Центральной Азии. Региональный экологический центр Центральной Азии.

43 Source: climatelinks.org

44 Bohart, G. E. (1958). Alfalfa pollinators with special reference to species other than honey-bees. In Proceedings of the 10th International Congress of Entomology (Vol. 4, p. 929).

45 Temreshev, I. I., Esenbekova, P. A., Kenzhegaliev, Y. M., Sagitov, A. O., Muhamadiev, N. S., & Homziak, J. (2017). Diurnal insect pollinators of legume forage crops in Southeastern Kazakhstan. International Journal of Entomology Research, 2(2), 17-30.

46 Ibi dem.



**TABLE 9: Selected top export crops for Kazakhstan<sup>47</sup> and their level of dependence on pollinators**

Crop	Export value US\$ 1,000	Dependence on pollinators
Wheat, flour	1,130,133.8	No dependence <sup>48</sup>
Barley	137,806.3	No dependence
Flax seed <sup>49</sup>	108,544	No dependence
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

## KYRGYZSTAN

### Land Degradation

About 21% of land in Kyrgyzstan (39,936 km<sup>2</sup>) is degraded, including 21% of croplands, 13% of forested areas and 38% of grasslands.<sup>50</sup> 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.<sup>51</sup> Wind and water erosion and forest felling are also drivers of land degradation in some areas.<sup>52</sup> Kyrgyzstan has pioneered adoption of a Pasture Law and establishment of Pasture Committees. These changes aimed at restoring herd mobility and seasonal use of pastures.

Kyrgyzstan has set voluntary LDN targets particularly 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 SLM 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<sup>53</sup> from 1990 baseline. 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 5).

47 Ministry of agriculture of the Republic of Kazakhstan <https://moa.gov.kz/documents/1543462437.pdf> (2018 data).

48 The dependence is identified as essential, great, moderate, little, increase reproduction or no dependence based on [http://www.fao.org/fleadmin/user\\_upload/pollination/docs/POLLINATION\\_VALUE\\_ARRAY.xls](http://www.fao.org/fleadmin/user_upload/pollination/docs/POLLINATION_VALUE_ARRAY.xls)

49 Although insect pollinators have been reported to favor gene flow in flax (Jhala et al., 2011).

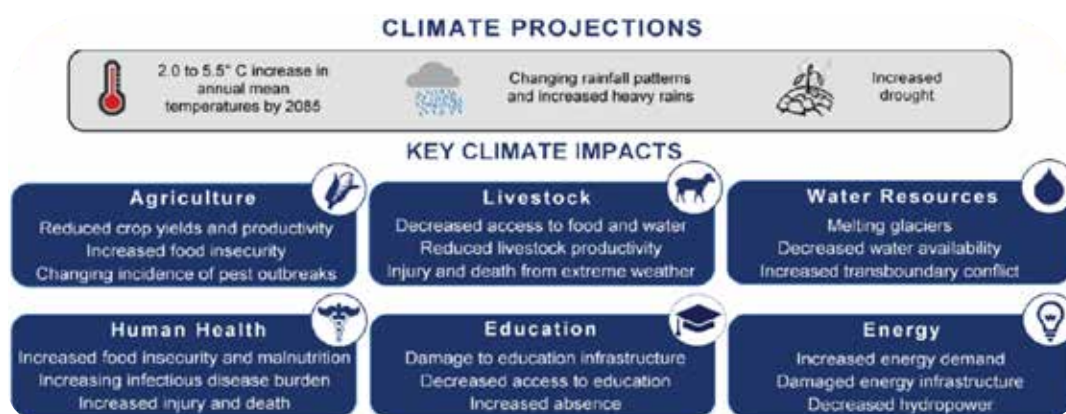
50 Le et al., 2014. Biomass productivity-based mapping of global land degradation hotspots. ZEF Discussion Papers on Development Policy, No. 193

51 Mirzabaev, A., Goedecke, J., Dubovyk, O., Djanibekov, U., Le, Q. B., & Aw-Hassan, A. (2016). Economics of land degradation in Central Asia. In Economics of land degradation and improvement—A global assessment for sustainable development (pp. 261-290). Springer, Cham.

52 GTZ (2007). Acting locally - cooperating regionally. Combating desertification in Central Asia. Regional Project to Support UNCCD Implementation in Central Asia.

53 CAREC (2018). Обзор по исполнению международных экологических конвенций в Центральной Азии. РЭЦЦА.

**FIGURE 5: Overview of Climate Projections and Key Climate Impacts in Kyrgyzstan<sup>54</sup>**



Source: climatlinks.org

### 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 10). 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.<sup>55</sup>

**TABLE 10: Selected top export crops for Kyrgyzstan<sup>56</sup> and their level of dependence on pollinators**

Crop	Export value US\$ 1,000	Dependence on pollinators <sup>57</sup>
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 <sup>58</sup>	22,799.7	Modest/Great
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 is 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*).<sup>59</sup> Radzevičiūtė et al. (2017) have found that several RNA viruses associated with honeybees (e.g. deformed wing virus complex) infect not only honeybee (*Apis mellifera*), but also many other wild bee species.

<sup>54</sup> Source: climatlinks.org

<sup>55</sup> Zhusupbaeva, A., Paxton, R., Huseman, M., Soro, A., Japoshvili, G. (2019). Species of bees revealed by DNA barcoding. Unpublished field data. Research project Identifying functional pollinator biodiversity and threats to its decline in Georgia and Kyrgyzstan supported by Volkswagen Foundation (2013 – 2016).

<sup>56</sup> www.stat.kg

<sup>57</sup> 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](http://www.fao.org/fileadmin/user_upload/pollination/docs/POLLINATION_VALUE_ARRAY.xls).

<sup>58</sup> Baracchi, D., Marples, A., Jenkins, A. J., Leitch, A. R., & Chittka, L. (2017). Nicotine in floral nectar pharmacologically influences bumblebee learning of floral features. *Scientific reports*, 7(1), 1951.

<sup>59</sup> Flora and Fauna International, Bishkek office.

## TAJIKISTAN

### Land Degradation

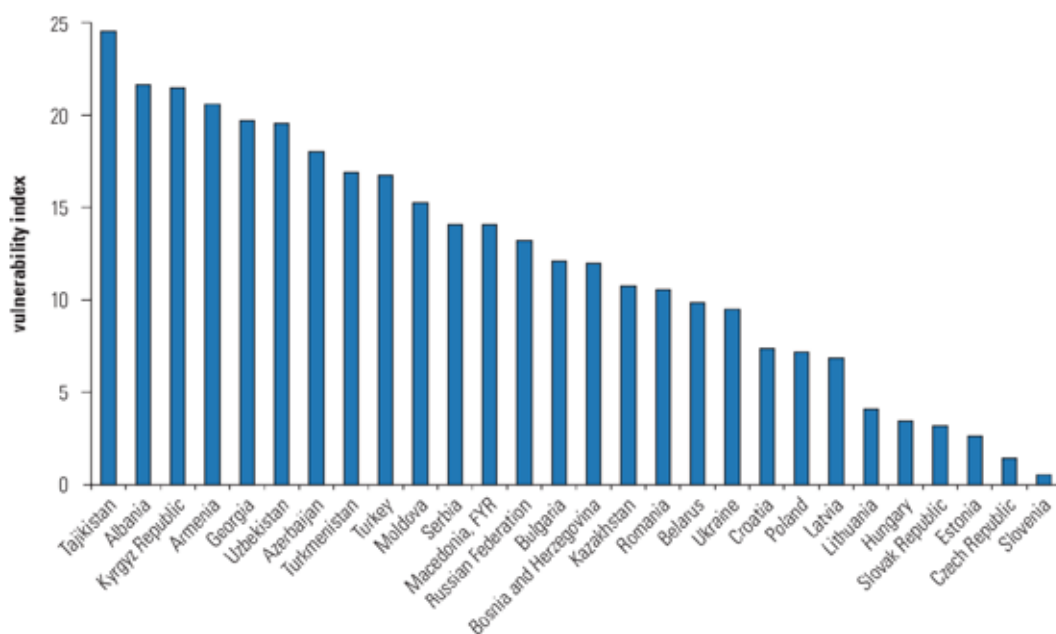
About 12% of land in Tajikistan (17,472 km<sup>2</sup>) is degraded, including 23% of croplands and 15% of grasslands.<sup>60</sup> Annual costs of land degradation are estimated to be US\$ 0.5 billion (US\$ 609 per capita).<sup>61</sup> Total economic value of land ecosystems is estimated to be US\$19 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 25-30% by 2030.<sup>62</sup>

Tajikistan is one of the most vulnerable countries to climate change (Figure 6). 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.<sup>63</sup> In a long term, a significant reduction of water run-off will pose unprecedented threats for irrigation agriculture, water supply and hydropower generation.

Figure 6: Climate Change Vulnerability Index<sup>64</sup>



### Pollinators

Many export crops of Tajikistan are dependent on pollinators (Table 11). 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 moderately dependent on pollinators, pollinator services can increase cotton yield on average by 19-33%. Experimental studies in the

60 Le et al., 2014. Biomass productivity-based mapping of global land degradation hotspots. ZEF Discussion Papers on Development Policy, No. 193

61 Mirzabaev, A., Goedecke, J., Dubovyk, O., Djanibekov, U., Le, Q. B., & Aw-Hassan, A. (2016). Economics of land degradation in Central Asia. In Economics of land degradation and improvement—A global assessment for sustainable development (pp. 261-290). Springer, Cham.

62 CAREC (2018). Обзор по исполнению международных экологических конвенций в Центральной Азии. РЭЦЦА.

63 Zoï Environment Network. (2009). Climate Change in Central Asia. A visual synthesis.

64 Source: Fay et al. 2010.

Fergana valley showed that honeybees increase cotton yields by 56%, while the quality of fiber and fat content did not appear to have changed (Table 12). Pollination services provided by honeybees increased the productivity of cherries and almonds by 26.4 and 16.9% respectively (Table 13). 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 honeybees to educate the community about the pollinators and their services.

**TABLE 11: Selected top export crops for Tajikistan<sup>65</sup> 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 <sup>66</sup>	3,500	Modest/Great

**TABLE 12: Extent of cotton yields increase in Fergana valley through pollinators (*Apis mellifera*)<sup>67</sup>**

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 13: Extent of yields increase in Fergana valley through pollinators (*Apis mellifera*)<sup>68</sup>**

Crop	Cherry	Almond	Plum	Apples	Apricots	Persimmons	Quince	Peach	Total
In-crease 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

65 www.stat.tj (Data for 2017. Export of goods 1993-2017).

66 Baracchi, D., Marples, A., Jenkins, A. J., Leitch, A. R., & Chittka, L. (2017). Nicotine in floral nectar pharmacologically influences bumblebee learning of floral features. *Scientific reports*, 7(1), 1951.

67 Based on data provided by Suyarkulov Sh. (experts from Uzbekistan). Personal communication.

68 Based on data provided by Suyarkulov Sh. (experts from Uzbekistan). Personal communication.





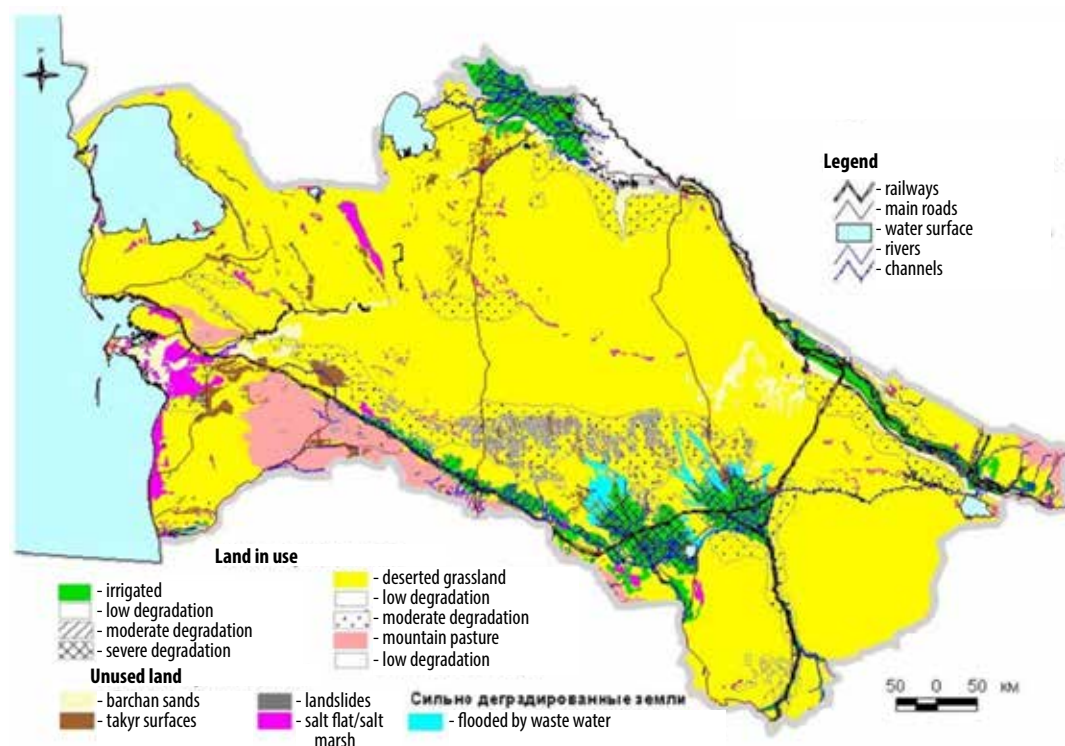
## TURKMENISTAN

### Land Degradation

About 8% of land in Turkmenistan (36,736 km<sup>2</sup>) is degraded, including 32% of croplands and 23% of grasslands (Figure 7).<sup>69</sup> More than 80 per cent (38 million hectares) of the land are pastures with more than half of the desert pastures in Turkmenistan being affected by land degradation.<sup>70</sup> Herding and animal husbandry is one of the priority sectors of local economy and the anthropogenic pressures on pastures are expected to grow.<sup>71</sup> Annual costs of land degradation per capita are estimated to be US\$ 1,083.<sup>72</sup> Degradation of pastures is most severe and happens due to several processes:<sup>73</sup>

- Conversion of pastures to irrigated agricultural land (e.g. 86% of pastures in Dashoguz region (4500 km<sup>2</sup>) have been converted from 1974 to 2004);
- Emergence of soil biogenic crust (consisting of the moss *T. desertorum*, lichens and cyano-bacteria) on remote pastures due to undergrazing;
- 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.);
- Secondary salinization in the irrigated areas.

**FIGURE 7: Land degradation in Turkmenistan<sup>74</sup>**



69 Le et al., 2014. Biomass productivity-based mapping of global land degradation hotspots. ZEF Discussion Papers on Development Policy, No. 193

70 The Economics of Land Degradation. Turkmenistan Case Study Policy Brief. Rehabilitating pasturelands and undertaking sustainable land management in deserts across Turkmenistan brings both economic and environmental benefits

71 The Economics of Land Degradation. Turkmenistan Case Study Policy Brief. Rehabilitating pasturelands and undertaking sustainable land management in deserts across Turkmenistan brings both economic and environmental benefits

72 Mirzabaev, A., Goedecke, J., Dubovyk, O., Djanibekov, U., Le, Q. B., & Aw-Hassan, A. (2016). Economics of land degradation in Central Asia. In Economics of land degradation and improvement—A global assessment for sustainable development (pp. 261-290). Springer, Cham.

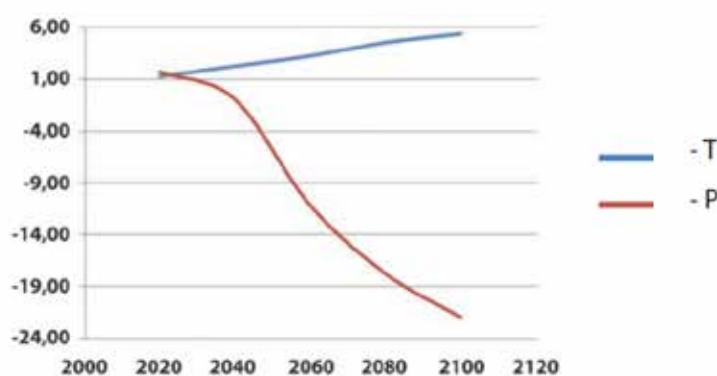
73 Kaplan et al., 2014. Land-use change and land degradation in Turkmenistan in the post-Soviet era. Journal of Arid Environments 103, 96-106

74 Adapted from Report Economic of Land Degradation in Central Asia, Turkmenistan, 2015

## Climate change

Turkmenistan joined UNFCCC in 1995. In September 2019, Turkmenistan adopted a new National Strategy for climate change adaptation and mitigation. Long-term climate and weather monitoring data for 1950-2010 shows that extreme weather events, such as droughts, floods, mudslides, windstorms and heat waves have become more frequent in recent years.<sup>75</sup> Most likely climate change scenarios predict increase in temperature and growing water shortages, which are likely to increase anthropogenic pressure on land resources and further exacerbate land degradation (Figure 8).

**FIGURE 8: Predicted change in average temperature and water availability<sup>76</sup>**



*Deviations from the normal average air temperature T (°C) and precipitation P (mm) for Turkmenistan on averaged scenarios A1FI and B1*

## Pollination

There is no data on status and trends in pollinator diversity and abundance in the country, however 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.

Cotton, raw and yarn, which have high export value in Turkmenistan, are modestly dependent on pollinators (Table 14). Meanwhile, 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. The beekeepers of Turkmenistan have created an association called "Turkmen ball" to foster cooperation and share knowledge and experience among each other. Beekeepers from the region reported to have used local religious and cultural values related to honeybees to educate the community about the pollinators and their services.

**TABLE 14: Selected top export crops for Turkmenistan and their level of dependence on pollinators**

Crop	Export value US\$ 1,000	Dependence on pollinators <sup>77</sup>
Cotton, raw and yarn <sup>78</sup>	306,000	Modest

<sup>75</sup> Turkmenistan TNC under the UNFCCC, 2015.

<sup>76</sup> Adopted from Turkmenistan's TNC under the UNFCCC, p. 54

<sup>77</sup> 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](http://www.fao.org/fileadmin/user_upload/pollination/docs/POLLINATION_VALUE_ARRAY.xls)

<sup>78</sup> <https://oec.world/en/profile/country/tkm/>

## UZBEKISTAN

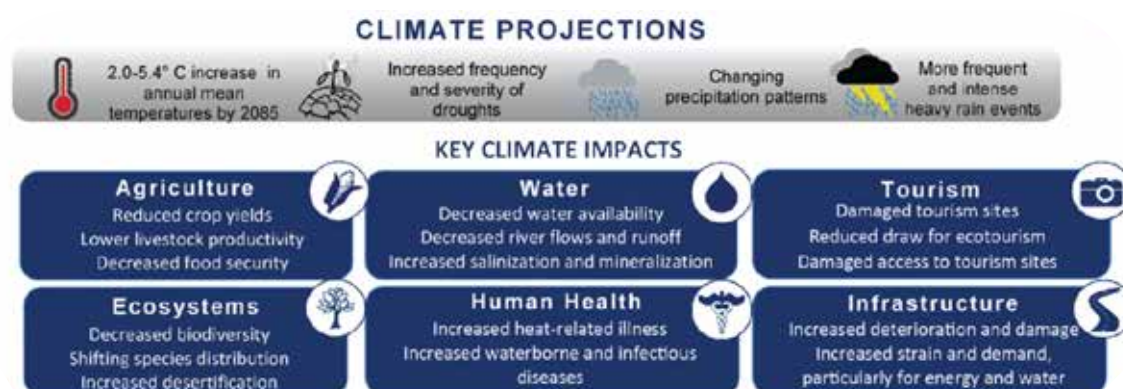
## Land Degradation

About 8% of land in Uzbekistan (35,136 km<sup>2</sup>) is degraded, including 26% of croplands and 17% of grasslands.<sup>79</sup> Some studies estimated that Uzbekistan lost up to US\$ 1 billion due to land degradation.<sup>80</sup> Annual cost of land degradation is estimated at US\$ 0.83 billion (US\$ 237 per capita).<sup>81</sup> Main drivers of land degradation are 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% against 2010 baseline by 2030<sup>82</sup> 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 9).<sup>83</sup>

**FIGURE 9: Overview of Climate Projections and Key Climate Impacts in Uzbekistan<sup>84</sup>**



Source: climatlinks.org

## Pollinators

Many local cash crops, such as cotton, fruits and vegetables are highly dependent on pollinators (Table 15). 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.<sup>85</sup> Researchers working in Surkhandarya region of Uzbekistan<sup>86</sup> found out that there only 5-6 pollinator species at the study site, namely, honeybee (*Apis mellifera*), bumblebee (*Vespa*),

79 Le et al., 2014. Biomass productivity-based mapping of global land degradation hotspots. ZEF Discussion Papers on Development Policy, No. 193

80 Sutton, W., Whitford, P., Stephens, E. M., Galinato, S. P., Nevel, B., Plonka, B., & Karamete, E. (2007). Integrating environment into agriculture and forestry. Progress and prospects in Eastern Europe and Central Asia. Kosovo: World Bank.

81 Mirzabaev, A., Goedecke, J., Dubovyk, O., Djanibekov, U., Le, Q. B., & Aw-Hassan, A. (2016). Economics of land degradation in Central Asia. In Economics of land degradation and improvement—A global assessment for sustainable development (pp. 261-290). Springer, Cham.

82 CAREC (2018). Обзор по исполнению международных экологических конвенций в Центральной Азии. РЭЦЦА.

83 Ibi dem

84 Source: climatlinks.org

85 Farming with alternative pollinators (FAP)/ICARDA

86 A project by Biodiversity International

wasp (Masarinae), fruit fly (Drosophilidae) and ants (Formicidae) (Table 16).<sup>87</sup> These pollinator species managed to pollinate various cash crops to various 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.<sup>88</sup>

**TABLE 15: Selected top export crops for Uzbekistan<sup>89</sup> and their level of dependence on pollinators**

Crop	Export value US\$ 1,000	Dependence on pollinators
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 16: Effectiveness of pollinators for various crops**

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

87 A project by Biodiversity International

88 Suyarkulov Sh. (experts from Uzbekistan) Personal communication.

89 WBG 2018. Export for data for Uzbekistan, 2016.





# ANNEX 1

## LIST PARTICIPANTS TO REGIONAL TRIALOGUE FOR CENTRAL ASIA AND AZERBAIJAN

Names	Title	Organization	Country*	Email
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# ANNEX 2

## AGENDA OF THE REGIONAL TRIALOGUE FOR CENTRAL ASIA AND AZERBAIJAN

### DAY 1

#### Wednesday 9th October

TIME	ACTIVITY
08:30 – 09:00	Registration
09:00 – 10:00	<b>Opening Ceremony</b> Group Photo Session
10:00 – 10:15	<b>Introductory Session:</b> Objectives, Agenda and Methodology
10:15 – 10:45	<i>Pollinator-themed Coffee Break</i>
10:45 – 11:30	<b>Keynote Speeches:</b> The Linkages between Ecosystem Health, Land Degradation and Climate Change
11:30 – 11:50	<b>Interactive Exercise:</b> Interdependence - The Value of Pollinators
11:50 – 12:30	<b>Panel Session:</b> What are the multiple values of pollinators and pollination services? Who holds the knowledge?
12:30 – 13:30	<i>Lunch</i>
13:30 – 17:30	<b>Field Visits:</b> Bright spots for pollination, sustainable land management and climate change

### DAY 2

#### Thursday 10th October

TIME	ACTIVITY
09:00 – 09:15	<b>Review of Day One</b>
09:15 – 10:10	<b>Keynote Speech:</b> How great is the problem? Status and trends for pollinators and food security
09:50 – 11:00	<b>World Café:</b> Land Degradation and other Drivers of Change to Pollinators and Pollination Services
11:00 – 11:30	<i>Coffee Break</i>
11:30 – 12:00	<b>World Café:</b> Land Degradation and other Drivers of Change to Pollinators and Pollination Services (Cont'd)
12:00 – 13:00	<b>Panel Session:</b> Progress with Land Degradation Neutrality targets and Sustainable Land Management plans and their contribution to improved ecosystem services
13:00 – 14:30	<i>Pollinator-Themed Lunch</i>
14:30 – 16:00	<b>Working Group:</b> Bright Spots: enhancing pollination services and sustainable land management practice
16:00 – 17:20	<b>Working Group:</b> Policy and Management Options to address the risks and opportunities for pollinators
17:20 – 18:00	<b>Recap of Day Two:</b> Communicating our messages
19:00 –	<i>Cultural Dinner</i>



## DAY 3

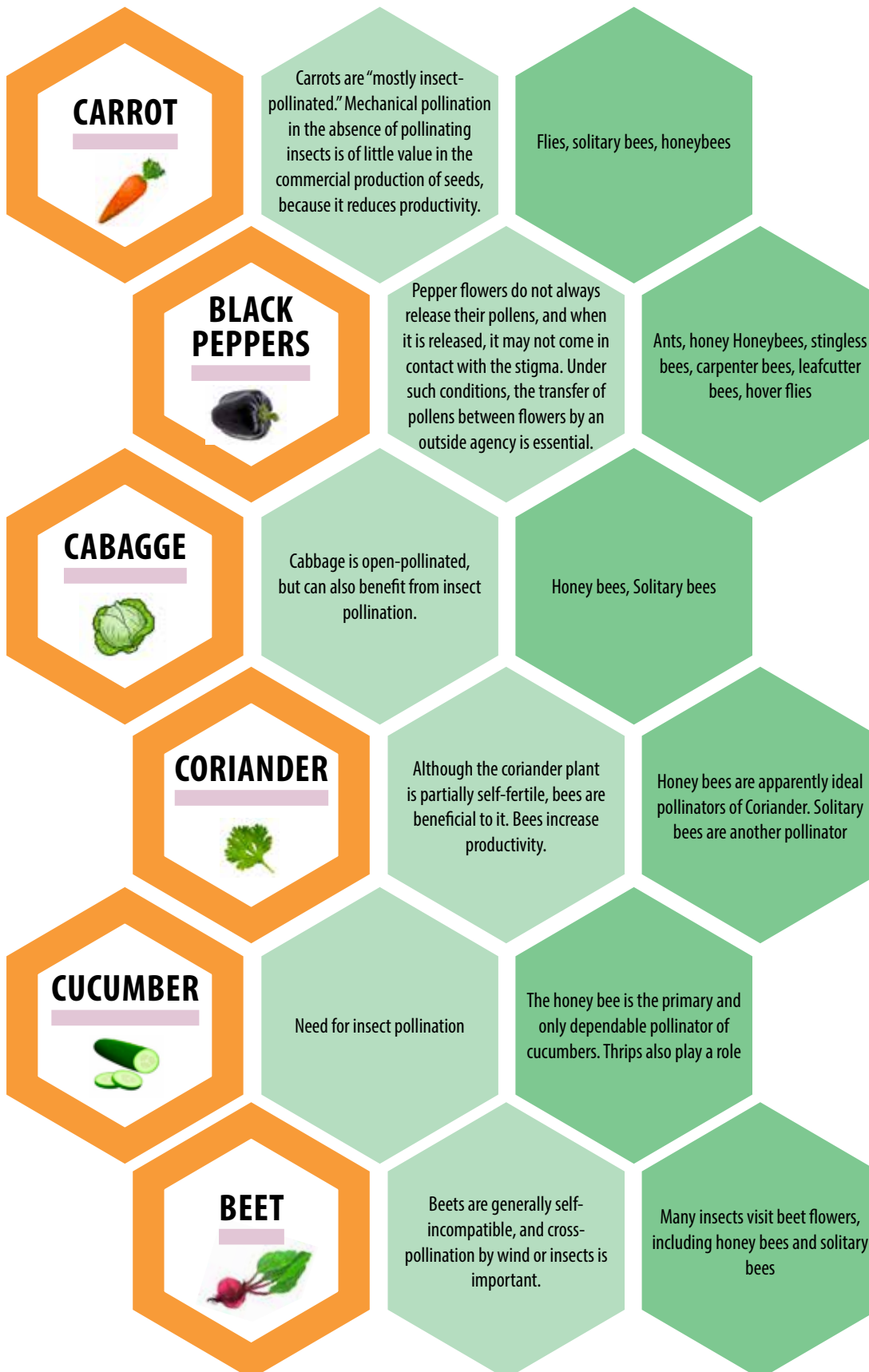
### Friday 11th October

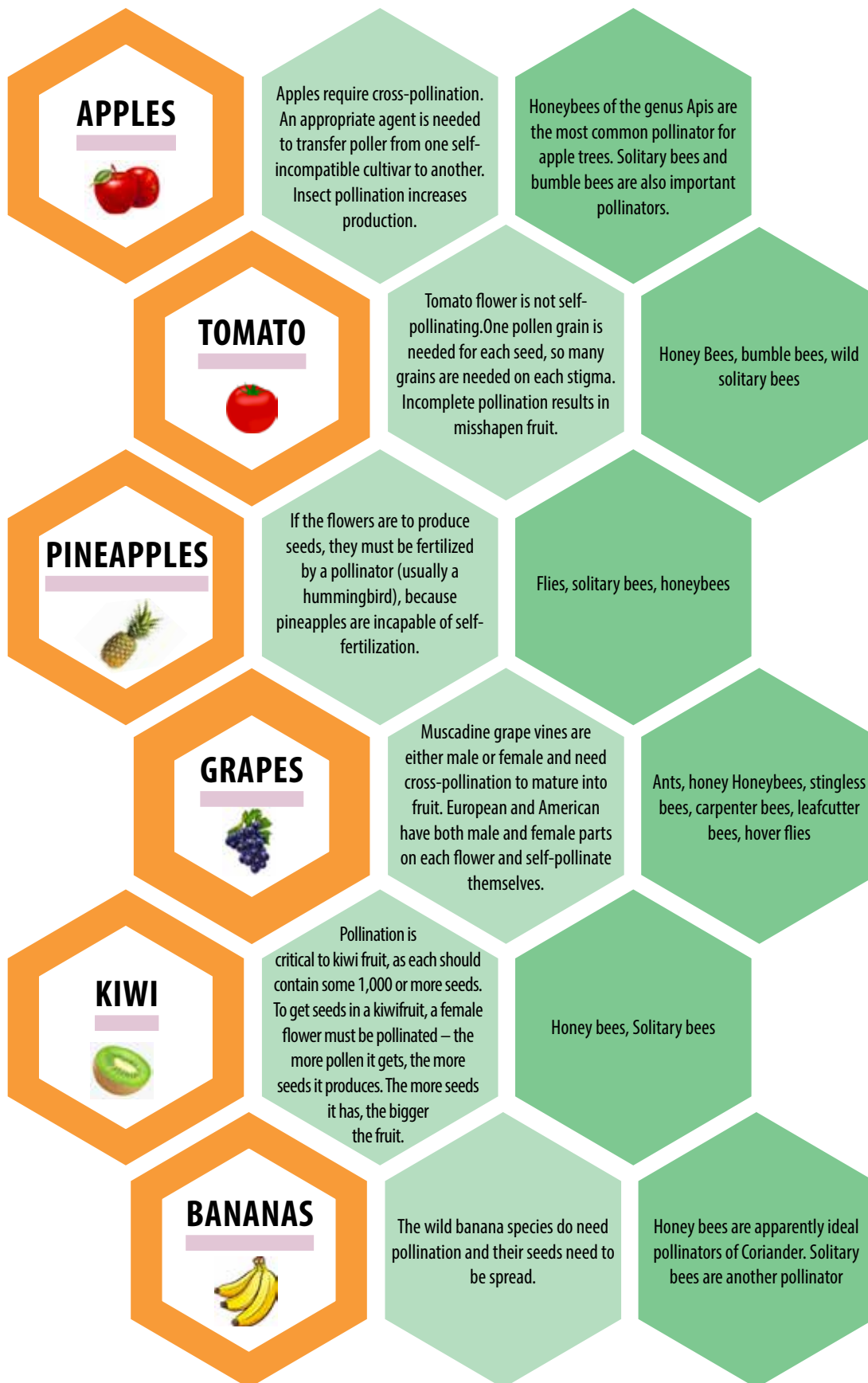
TIME	ACTIVITY
08:30 – 10:00 [Parallel]	<b>High-Level Breakfast</b> Key messages from the IPBES global assessment and from the Triologue sessions to be discussed by the policy sector participants, donors and development partners
08:30 – 10:00 [Parallel]	<b>Innovation Corner</b> Participants to “sell” or design prototype innovative project ideas: This is the opportunity to showcase their ideas and have other participants help brainstorm or connect them to other relevant projects.
10:15 – 10:30	Feedback from the High-Level Breakfast and Innovation Corner
10:30 – 10:45	<i>Coffee Break</i>
10:45 – 11:05	<b>Working Group Feedback:</b> Policy and management options to address the risks and opportunities
11:05 – 13:00	<b>Working Group:</b> Refining the Central Asia National and Regional Action Plans
13:00 – 14:30	<i>Lunch</i>
14:30 – 15:00	<b>Working Group Feedback:</b> Refining the Regional Action Plans
15:00 – 16:00	<b>Closing Panel:</b> How to move forward and keep the momentum going
16:00 – 16:30	Moment of reflection and evaluation
16:30 – 17:00	<b>Closing Session</b>



# ANNEX 3

## LOCAL POLLINATION-DEPENDENT INGREDIENTS USED FOR THE TRIALOGUE









# ANNEX 4

## LDN TARGETS AT NATIONAL LEVEL

### Azerbaijan

Not available

### Kazakhstan

DN 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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