



*Ecosystem Profile*

*The Mountains of Central Asia*

# DRAFT 1.0

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Please send your comments to [viktor.novikov@zoinet.org](mailto:viktor.novikov@zoinet.org) and [firuza.illarionova@zoinet.org](mailto:firuza.illarionova@zoinet.org)  
before **15 December 2016** for consideration in the second draft

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## **EXECUTIVE SUMMARY**

The Critical Ecosystem Partnership Fund (CEPF) is designed to safeguard the world's biologically richest and most threatened regions, known as biodiversity hotspots. It is a joint initiative of l'Agence Française de Développement (AFD), Conservation International (CI), the Global Environment Facility (GEF), the Government of Japan, the John D. and Catherine T. MacArthur Foundation, and the World Bank.

CEPF is unique among funding mechanisms in that it focuses on biological areas rather than political boundaries and examines conservation threats on a landscape-scale basis. From this perspective, CEPF seeks to identify and support a regional rather than national approach to achieving conservation outcomes, and engages a wide range of public and private institutions to address conservation needs through coordinated regional efforts.

A fundamental purpose of CEPF is to engage civil society, such as community groups, nongovernmental organizations (NGOs), academic institutions and private enterprises, in biodiversity conservation in the hotspots. To guarantee their success, these efforts must complement existing strategies and programs of national governments and other conservation funders. To this end, CEPF promotes working alliances among diverse groups, combining unique capacities and reducing duplication of effort for a comprehensive, coordinated approach to conservation. One way in which CEPF does this is through preparation of ecosystem profiles that articulate a five-year investment strategy informed by a detailed situational analysis.

This document represents the ecosystem profile for the Mountains of Central Asia biodiversity hotspot, which comprises all of Kyrgyzstan and Tajikistan, plus parts of China, Kazakhstan, Uzbekistan, Turkmenistan and Afghanistan.

In 2016, CEPF came together with the European Union and other members of its Donor Council to discuss common interests with regard to investments in the Mountains of Central Asia hotspot and donors agreed to fund the ecosystem profile preparation. The profile process was launched in May 2016, and concludes in May 2017.

The CEPF Secretariat, in collaboration with Zoï Environment Network, coordinated the process, consulting more than 500 stakeholders through consultation workshops, other meetings and email correspondence, resulting in a final document that is a collaborative product of many representatives of civil society, government and the donor community.

### **Conservation Outcomes**

As of 15 November 2016 (first draft document), about 150 KBAs occupying an area of XXX hectares were identified in the hotspot. At least half of these KBAs could be defined as sites compatible with the IUCN 2016 Standard criteria, underlined by the robust data and spatially clear. The remaining sites could be considered as candidates. In addition, about 30 conservation landscapes and corridors were identified. These contain major clusters of KBAs and serve to provide a larger geographical focus for investment. They also present opportunities for landscape planning to increase ecosystem resilience and maintain ecosystem services, especially in the face of climate change, and have been designed to complement earlier spatial planning initiatives, such as the World Wildlife Fund (WWF) Econet in Central Asia.

CEPF will provide a source of funding that is designed to reach civil society in a way that complements funding to government agencies and inspires innovative conservation activities, in particular those that demonstrate the link between biodiversity and development.

## **Other Important Considerations**

In recent years there has been a gradual reduction in the amount of funding available for conservation, as donors have shifted focus to other issues (notably climate change). At the same time, changing political and economic conditions are facilitating greater private sector investment in mining, agriculture, infrastructure and other sectors with potentially large environmental footprints. While these trends present conservation challenges, one positive development has been the growth of domestic civil society groups engaged in biodiversity conservation and related issues of sustainable development, poverty alleviation and social equity.

The emergence of these groups presents opportunities for CEPF and other funders to support coalitions of civil society, ranging from international NGOs to community-based organizations.

## **Preliminary elements of CEPF Investment Strategy**

There was consensus during the stakeholder consultations that CEPF should focus geographically on (update after regional consultations and comments):

1. China: Ili River landscape, Bogda Shan (Tianshan Tian Chi), Kalamaili Shan, Tomur, Pamir Plateau, Jungaria, Bayanbulak, Kaidu and Bosten Lake wetlands
2. Kazakhstan: The Karatau Ridge, the Western Tian Shan (also in cross-border context) and the Ile-Alatau Range and the Djungar Alatau
3. Kyrgyzstan: The Western Tian Shan (also in cross-border context), the Central Tian Shan, juniper and wild fruit-and-nut forests of southwest Kyrgyzstan, wetlands of Son-Kul, Chatyr-Kul and Issyk Kul Lake
4. Tajikistan: Central Tajikistan (Dashtijum, Muminobad), Western Pamir valleys, high Pamir (also in cross-border context with Afghanistan, Kyrgyzstan, China)
5. Uzbekistan: The Western Tien Shan (also in cross-border context), Hissar Range, the Aidarsay-Nurata desert-to-mountain transition zone, parts of Ferghana Valley
6. Turkmenistan: The Koytendag Ridge
7. Afghanistan: The Wakhan National Park

The thematic priorities for conservation investment in the hotspot were defined through the stakeholder consultations and based on an analysis of the main threats to biodiversity in the hotspot and their root causes. The highest ranked threats were habitat change and overexploitation, which threaten species with extinction and impact wider ecosystems. Climate change was identified as significant and long-term challenge, too. These threats have major implications for national economies and the livelihoods of rural people, both of which depend upon the services provided by natural ecosystems.

To respond to these and other threats, and to begin to address some of their root causes, CEPF formulated an investment niche comprising 9 investment priorities grouped into 30 strategic directions. The investment strategy elaboration will continue between December 2016 and March 2017 during a consultative process engaging both civil society and government stakeholders, as well as CEPF's donor partners. The CEPF

strategy forms the basis for coordinated investment by CEPF and other donors interested in supporting conservation efforts in the region.

The ecosystem profile presents an overview of the Mountains of Central Asia in terms of its biodiversity, conservation importance, and socioeconomic, policy and civil society contexts. It defines a suite of measurable conservation measures or outcomes, at species, site and landscape levels, and assesses the major threats to biodiversity and their root causes. The situational analysis is completed by assessments of current conservation investment, and the implications of climate change for biodiversity conditions and conservation. The ecosystem profile then goes on to present an investment strategy for CEPF and other funders interested in supporting conservation efforts led by civil society.

The CEPF investments typically cover a five-year period, complementing investments by the other funders. It comprises a series of strategic directions, broken down into a number of investment priorities outlining the types of activities that will be eligible for CEPF funding. Civil society organizations may propose projects that will help implement the strategy by addressing at least one strategic direction. The ecosystem profile does not include specific project concepts, as civil society groups will develop these as part of their applications for CEPF grant funding.

The biological basis for CEPF investment in the Mountains of Central Asia hotspot is provided by conservation outcomes: the quantifiable set of species, sites and landscapes that must be conserved to reduce biodiversity loss globally. In order to direct investment by CEPF and other funders effectively, the species, site and landscape outcomes were prioritized through the stakeholder consultations, considering urgency of conservation action and opportunity to enhance existing conservation efforts and plans, including the National Biodiversity Strategies and Action Plans (NBSAPs) and targets.

A total of **XXX** species outcomes, about **150** site outcomes and **30** corridor outcomes were defined for the hotspot. Among these, **X** species, **Y** sites and **Z** landscapes were prioritized for CEPF investments.

**Table 1. CEPF strategic directions and investment priorities for the hotspot**

CEPF Strategic Directions	CEPF Investment Priorities
<p><b>1. Address threats to high-value and priority species</b></p>	<p>1.1. Improve enforcement and develop incentives and alternatives for nature users and collectors</p> <p>1.2. Promote improved regulation of the collecting, hunting and fishing (exploitation) of high-value species</p> <p>1.3. Support the development of community micro reserves</p> <p>1.4. Provide information for conservation actions and decision-making based on improved monitoring, science and research</p>

CEPF Strategic Directions	CEPF Investment Priorities
<p><b>2. Improve management of Key Biodiversity Areas with and without official protection status</b></p>	<p>2.1. Facilitate effective collaboration between CSOs, local communities and park management units, and support survey research to enhance protected area networks</p> <p>2.2. Develop and implement management approaches to sustainable use in KBAs outside official protected areas</p> <p>2.3. Develop legal and policy instruments for better site management, and build support for recognition of KBAs</p>
<p><b>3. Support conservation and sustainable management of mountain forests</b></p>	<p>3.1. Support afforestation, reforestation and high-value forest gene pool conservation</p> <p>3.2. Reduce grazing pressures on forests and shrubs</p> <p>3.3. Develop alternative energy sources near settlements</p> <p>3.4. Promote sustainable forest certification and value chains</p>
<p><b>4. Engage communities of interest and economic sectors – including the private sector – in conservation of KBAs and landscapes</b></p>	<p>4.1. Engage hunting associations, tourism operators and mining companies in conservation management</p> <p>4.2. Disseminate best conservation practices in agriculture</p> <p>4.3. Educate infrastructure developers to the presence of KBAs</p>
<p><b>5. Enhance civil society capacity for effective conservation action</b></p>	<p>5.1. Enable and enhance communications between environmental authorities and local communities on conservation issues</p> <p>5.2. Enhance civil society organizations capacity for planning, implementation, monitoring, outreach and communication</p> <p>5.3. Catalyze networking and collaboration</p> <p>5.4. Increase sustainable funding to civil society for conservation actions via capacity building and appropriate mechanisms</p> <p>5.5. Promote civil society efforts to support implementation of national biodiversity strategies</p>
<p><b>6. Conduct targeted education, training and awareness raising to build capacity and support for biodiversity conservation</b></p>	<p>6.1. Invest in the professional development of future conservation leaders through support to education and research programs at domestic and regional academic institutions</p> <p>6.2. Conduct programs on education to engage school children with nature in priority KBAs and landscapes</p> <p>6.3. Engage the media as a tool to increase awareness about KBAs and inform public debate of conservation issues</p>
<p><b>7. Integrate biodiversity priorities into regional and local climate change actions</b></p>	<p>7.1. Support action-oriented research on the impact of climate change on vulnerable species and KBAs</p> <p>7.2. Support conservation of high-value species and vulnerable KBAs in view of the changing climate conditions, altitudinal shifts of ecosystems and land use changes</p>

CEPF Strategic Directions	CEPF Investment Priorities
<p><b>8. Support cross-border collaboration, experience exchange and information sharing on biodiversity</b></p>	<p>8.1. Promote collaboration that enhances conservation outcomes, and improve the long-term effect of actions across borders</p> <p>8.2. Advance the assessment of, and encourage experience exchange and information sharing on, the state of biodiversity, globally threatened species and KBAs</p>
<p><b>9. Provide strategic leadership and effective coordination of conservation investment through a regional implementation team</b></p>	<p>9.1. Operationalize and coordinate CEPF's grant-making processes</p> <p>9.2. Build a broad constituency of civil society groups</p> <p>9.3. Encourage the integration of biodiversity considerations into government and business policies and practices</p> <p>9.4. Monitor geographic and thematic priorities in relation to the long-term sustainability of conservation in the hotspot</p> <p>9.5. Implement a system for disseminating and popularizing information on conservation and the value of biodiversity in the hotspot</p>



## 1. INTRODUCTION

Biodiversity forms a key element of the environment that underpins human well-being, and its loss harms evolutionary potential. Despite recognition of this, such loss is accelerating globally (Butchart *et al.* 2010) as species-rich natural ecosystems are overexploited, mined or replaced by simple, artificial systems that are more effective at producing the food, energy and other needs of growing populations. This simplification and extinction of unique biodiversity diminishes human cultures, destroys livelihoods that have evolved, and erodes the genetic diversity.

There are many reasons for this contradiction between acknowledging the value of biodiversity while allowing its destruction in pursuit of economic growth, but fundamentally it stems from the choices of individuals based on the range of options available to them. Conservation, therefore, is about changing people's perspectives and choices, so they make decisions that favor the sustainable use of natural resources.

Civil society organizations (CSOs) are in a unique position to influence people's choices, habits and behavior because they are based in or work with communities. Unlike government, CSOs have no power to compel people to change, so they have learned to influence choices and behavior by combining education and incentives, providing them new knowledge and better technologies, and by helping people achieve their aspirations for development while taking a long-term perspective on the environment.

Biodiversity and the threats to it are not distributed evenly over the planet, biodiversity hotspot or a country. Conservation organizations can maximize the effectiveness of their limited funds by focusing on the places that are the most important and where action is most urgent. One of the most influential priority setting analyses was the identification of biodiversity hotspots (Myers *et al.* 2000; Mittermeier *et al.* 2004), defined as regions that have at least 1,500 endemic plants species and have lost at least 70 percent of their natural habitat. There are 34 hotspots globally, covering 15.7 percent of the earth's surface. The intact natural habitats within these hotspots cover only 2.3 percent of the world's surface, but contain half of all plants and 77 percent of all terrestrial vertebrates.

**Figure 1. Global Biodiversity Hotspots Map**  
[placeholder]

**Figure 2. Map of Mountains of Central Asia Hotspot**  
[placeholder]

The Mountains of Central Asia hotspot consists of two of Asia's major mountain ranges, the Pamir and the Tien Shan. The hotspot's 860,000 square kilometers include parts of seven countries: southeastern Kazakhstan, most of Kyrgyzstan and Tajikistan, eastern Uzbekistan, western China, northeastern Afghanistan, and a small mountain part of southeast Turkmenistan. Hotspot delineation is based on the Global 200 eco-regions (Olson, D. M. and Dinerstein, E., 2002 [http://www.panda.org/about\\_our\\_earth/ecoregions/ecoregion\\_list/](http://www.panda.org/about_our_earth/ecoregions/ecoregion_list/)).

The global eco-region of Middle Asian Montane Grasslands and Shrublands is made up of Hissar-Alai open woodlands, Pamir alpine desert and tundra, Tian Shan montane conifer forests, Alai-Western Tian Shan steppe, Hindu Kush alpine meadow, Tian Shan montane steppe and meadows and Tian Shan foothill arid steppe. Altitudinal complexity leads to the creation of isolated habitats and associated species diversity. The most

diverse ecosystems are mixed forests and meadows between 1,000 and 3,000 m where up to 15 per cent of the flora is endemic.

The hotspot has mountains reaching 5,000-7,000 meters in elevation, hosts several ancient oases and cities and is composed of distinct economies, cultures, and political systems, and of contrasting civil society conditions.

The Pamir Mountains, which include both Pamirs of China and Tajikistan bordered by the Alai Mountains of Kyrgyzstan and the Hindu-Kush of Afghanistan, is known as the “roof of the world”. The central Pamir is a high-elevation plateau with various altitudinal variations, while the western and eastern edges of the Pamir are characterized by sharp ridges, steep slopes and deeply cut river valleys. The hotspot's highest peak is Kongur, which rises to 7,719 meters in the China; at least six other mountains in Tajikistan, Kyrgyzstan and Afghanistan are above 7,000 meters.

The 300-km-long, 150-km-wide Ferghana Valley separates the Pamirs from the Tien Shan Mountains. The Tien Shan “heavenly mountains” extend for nearly 2,500 kilometers from west to east. The hotspot holds at least 20,000 glaciers, covering around 35,000 km<sup>2</sup>. The large glaciers reach 50-70 km in length, with Tajikistan being the most glacier-covered country, where they occupy about 6 percent of the country.

The climate in the mountains of Central Asia is arid. Precipitation falls mainly in winter and spring and varies from more than 1,000 millimeters in central parts of Tajikistan and Kyrgyzstan in the west of the hotspot to less than 100 millimeters in the rain-shadowed interior parts – such as Murgab of Tajikistan in the central part of Pamir.

The predominant vegetation types in the hotspot are desert, semi-desert and steppe on all the lower slopes and foothills and in some of the outlying ranges and major basins. Patches of riverine woodland (“tugai”) survive along the Ili, Amu Darya, Zeravshan, Syr Darya rivers and a few other places. At higher altitudes, steppe communities dominated by various species of grasses and herbs occur, while shrub communities are widespread in the lower steppe zone. Spruce forests, the only coniferous forest type in the hotspot, occur on the moist northern slopes of the Tien Shans, while open juniper forest occurs widely between 1,000 and 2,800 meters. Meadows typically occur at higher elevations. At the very highest and coldest elevations, there is limited vegetation cover and diversity, with cushion plants, snow-patch plants and tundra-like vegetation as well as glaciers.

The Mountains of Central Asia hotspot contains ancestors of domestic fruit and nut varieties, wild relatives of crops, and is an important storehouse of genetic diversity. The hotspot is also home to a rich variety of mountain ungulates and the snow leopard.

Overall, about **XX** percent of the hotspot is under some form of official protection. Some reserves are small and isolated; others are too large or not well functioning. Since the breakup of the Soviet Union, followed by reinforcement of national borders and decades of conflict in Afghanistan, there has been a dramatic decrease in funding, patrols and other management activities in many mountain protected areas.

The smallest protected area and KBA within the hotspot is the 12 km<sup>2</sup> Gongliuyehetao Chinese Walnut Nature Reserve, while the Taxkorgan Nature Reserve in China and the

Tajik National Park in Tajikistan reach 14,000 and 26,000 km<sup>2</sup> respectively. Other large protected areas include Issyk-Kul Biosphere Reserve in Kyrgyzstan; Mount Tomur Nature Reserve (1,000 km<sup>2</sup>) and Boghdad Mountain Biosphere Reserve (1,000 km<sup>2</sup>), both in the Chinese part of the Tien Shan. Other notable reserves in the countries of the former Soviet Union include some of the oldest well functioning reserves – Aksu-Zhabagly and Almaty in Kazakhstan, Koytendag in Turkmenistan. Afghanistan is proud of its new and large Wakhan National Park.

Because international borders often follow mountain ridges, the need for transboundary cooperation to protect mountain ecosystems is increasingly recognized within the region. Many protected areas and KBAs face the country borders. Regional and bilateral cooperation exist between the Central Asia countries of the former Soviet Union, with Afghanistan and with China. Earlier efforts included envisioning of a Central Asian Mountain Information Network, a Regional Red List to coordinate assessments and set up a database of threatened species, and Western Tien Shan and Pamir-Alai conservation and environmental initiatives.

Several international donors and partners are actively involved in conservation in the region, including the Global Environment Facility (GEF), World Wildlife Fund (WWF), Birdlife and RSBP, Wildlife Conservation Society (WCS), Fauna and Flora International (FFI), a German nature conservation organization (NABU) and others. The governments of Japan, Germany, Switzerland, Finland, Russia, China, the United States and others supported programs on sustainable natural resource use and environmental projects. Private foundations such as Christensen, Leonardo DiCaprio and Aga-Khan are also supporting sustainable development and conservation initiatives in the hotspot. Conservation-related CSOs receive support from various donors and tend to work on awareness raising and education, ecotourism, forest and pasture management initiatives, wildlife monitoring and conservation, climate change adaptation and alternative energy projects that can contribute to the local economy and gain support for conservation.

Several initiatives in the region are taking a wider approach to issues affecting the environment. A Global Mountain Summit, held in Kyrgyzstan in 2002, explored united approaches for mountain development. The Asian Development Bank, UNEP and the Swiss government sponsored elaboration of a Regional Strategy for Sustainable Development of the Mountain Regions of Central Asia in 2009 (draft exists). A Global Snow Leopard Summit held in Bishkek in 2013 resulted in the adoption of the Bishkek Declaration and establishment of the Global Snow Leopard and Ecosystem Protection Program (GSLEP) active in 12 countries, including all 7 countries of the hotspot.

This profile departs from the usual alphabetical order for countries, and instead reflects the relative shares of the area under investigation and the potential participation in conservation projects of the Critical Ecosystem Partnership Fund. As a potential co-funder of research and conservation projects, and as the country with the most land falling within the boundaries of the hotspot, China appears first on the list. Next come Kyrgyzstan and Tajikistan, the territories of which fall almost entirely inside the hotspot. Kazakhstan, Uzbekistan and Turkmenistan follow, each with less land area in the hotspot, and with a smaller share of their total territory. As a least developed country with ongoing instability, Afghanistan comes last.

## 2. BACKGROUND

This chapter describes the ecosystem profile process, including the compilation of the profile document on the Mountains of Central Asia and the stakeholder consultations.

The purposes of this ecosystem profile are to provide an overview of biodiversity conservation in the Mountains of Central Asia global biodiversity hotspot, to present an analysis of the priorities for action, and to strengthen the constituency for conservation in the region. In doing so, the profile lays out a framework for the implementation of the CEPF grant-making program, which will run for about five years from 2017 to 2022, and which defines a broad conservation agenda in the region. The profile intends to encourage more stakeholders to engage with and support this agenda.

CEPF makes grants to civil society organizations, which are defined as organizations outside of government – NGOs; community groups; academic institutions; business, trade and socio-political organizations. For CEPF, understanding the interests, capacity and needs of civil society in Central Asia is as important as understanding its biodiversity. Although CEPF makes grants to civil society, government plays a critical role in conservation and is always a partner in its efforts.

The ecosystem profile describes biodiversity conservation actions needed in the mountains of Central Asia by defining conservation outcomes. As described in detail in Chapter 4, these outcomes are defined at three levels – species, sites and corridors. The outcomes are defined for species of conservation concern, which principally means those that are considered by the International Union for Conservation of Nature (IUCN) Red List to be globally threatened: critically endangered (CR), endangered (EN) and vulnerable (VU). During stakeholder consultation participants also recommended inclusion of several near threatened (NT) species.

In addition to the IUCN red list, the profile team reviewed existing analyses from BirdLife's Important Bird Areas (IBAs), WWF's Econet for Central Asia, national red lists, published books and atlases, reports and papers describing species and habitats in the mountains of Central Asia, as well as unpublished reports and information available on the Internet.

The preliminary list of sites identified for species of conservation concern was discussed with local and international scientists. Data and comments came from [XXX, update after Almaty regional meeting, email feedbacks and Senior Advisory Group inputs]. In addition to the knowledge of experts, the team sought the input of local communities, businesses and civil society organizations and governments in Central Asia.

The profiling process has involved a rapid assessment and evaluation of the current causes of biodiversity loss throughout the Mountains of Central Asia Hotspot, coupled with an inventory of actual conservation and development investments taking place within the region. Zoï Environment Network prepared the ecosystem profile, with contributions from numerous national partners.


The main activities that comprise the profiling process are:

- Definition of conservation outcomes
- Analysis of socioeconomic, policy and civil society context, and assessment of threats and current conservation investments in the hotspot

- Consultation with a wide range of national and international stakeholders
- Formulation of a CEPF niche and investment strategy for the hotspot


Results were obtained by synthesizing and analyzing existing biological and thematic information to inform a participatory priority-setting process that sought to include all key players in the MCA biodiversity conservation community. The purpose was to secure broad-based scientific and general practice agreement on the priorities for conservation and then to define a strategy with specific conservation targets and actions for future CEPF and other international investments with diverse stakeholders.

This process engaged experts from numerous disciplines, as well as government agencies, nongovernmental organizations, donor organizations and other stakeholders. The profiling has also capitalized on priority-setting processes that have already taken place in a number of the countries, such as the development of National Biodiversity Strategies and Action Plans (NBSAPs), national protected areas strategies and national biodiversity gap analyses. The profiling team analyzed up-to-date information on current activities and threats affecting biodiversity conservation in the hotspot, as well as current levels of investment and other data to formulate a conservation strategy.

The main findings of the studies, especially KBAs, were reviewed and verified at a series of consultation workshops, involving stakeholders from civil society and governmental agencies. These meetings also provided an opportunity for stakeholders to propose revisions to the lists of priority species, sites and corridors; identify and prioritize key threats to biodiversity; and propose investment priorities and discuss prototype projects. Considering that the KBA concept is new to Central Asia, where only the important bird areas were mapped so far, the profile team has designed popular cartoons, leaflets and posters (see Annex ) to broaden and ease the understanding of the KBA and Ecosystem Profile process by the key stakeholders in the region.

Ecosystem profiles bring together three key constituencies in order to maximize conservation impacts: national and international biodiversity experts; donors; and national and regional stakeholders in the hotspot. The last constituency includes stakeholders such as civil society organizations, national government agencies and academic institutions to ensure that they have a sense of ownership of the CEPF strategy and that the profile is fully informed by on-the-ground knowledge and expertise.

Experts have been engaged in the development of the profile through electronic communication, participation in national and subregional meetings and consultancies. All experts, contributors and reviewers involved will be listed in the final profile.

The participatory process that is key for a successful conclusion to the profiling exercise involved three stages: national consultations that set the context for priority geographic areas and types of investments; questionnaires; and a regional consultation in Almaty that contributes to regional experience exchange, validation of the hotspot map of KBAs and landscapes and discusses the provisional elements of the CEPF investment strategy. The meetings involved a total of about 200 participants including 130 participants from domestic CSOs, 40 from government institutions, and another 40 from international organizations, donors and the profiling team (Table ). More than 500 experts, CSO members, donors and government representatives were contacted by the team in 2016.

**Table 2. Dates and participants of expert meetings and stakeholder consultations in 2016**

Country	Expert meetings	Kick-off meetings	Nat. consultations	Regional
China	June (1), September (10)	Urumqi, 28 SEP (25 pers.)	Urumqi, 28 SEP (25 pers.)	(1)
Kyrgyzstan	June (7), September (7), October (10)	Bishkek, 10 JUN (35 pers.)	Bishkek, 3-4 OCT (48 pers.)	(8)
Tajikistan	June (6), September (6), October (6)	Dushanbe, 7 JUN (33 pers.)	Dushanbe, 13-14 OCT (42 pers.)	(2)
Kazakhstan	June (5), September (5), October (5)	Astana, 2 JUN (37) Almaty, 9 JUN (30)	Almaty, 30 SEP (35 pers.)	(6)
Uzbekistan	June (5), October (5)	<i>No official meetings</i>	<i>No meetings</i>	(4)
Turkmenistan	Teleconference (3)	<i>No meetings</i>	<i>No meetings</i>	(2)
Afghanistan	September (3), October	<i>No meetings</i>	<i>No meetings (1)</i>	(1)
TOTAL*	40	160	150	40

\* including international organizations and partners

Source: Zoi Environment Network, Ecosystem Profile team

Questionnaires for CSOs (see annex [2](#)) were designed by the project team and distributed directly through email and web pages, and during consultations. About 100 responses provided much of the information needed for the profile sections on civil society and enriched information on threats and investments, and gave valuable suggestions for the investment strategy. A follow-up period of electronic consultations will ensure that the remaining information gaps will be considered and addressed to the extent feasible.

The regional consultations in Almaty on 12 December 2016, International mountain day, will gather country lead experts, members of the profiling team, representatives of regional and international stakeholders, GEF focal points and other decision makers. Participants will discuss the regional synthesis of KBAs, conservation outcomes and the elements of investment strategy for the hotspot. On the basis of these discussions they will recommend and confirm the strategic directions and investment priorities for CEPF during the five-year investment period of 2017-2022.

An advisory committee provides overall guidance in preparing the profile. It will conduct its main work from December 2016 to February 2017 and will likely comprise key national and regional players. The updated draft document will also be presented to the GEF Operational Focal Points in the countries.

One of the important lessons from the process of compiling the ecosystem profile is that, while there are many gaps in data on biodiversity in the region, there is also a great deal of data, published and unpublished, within conservation organizations, universities, held by individual scientists, companies, government departments, and amateur observers. The ecosystem profile represents one of the attempts to collate the data and make it available to conservationists, decision makers and other stakeholders in the region. It is the first ever experience of application of the newest IUCN 2016 Standard on the Key Biodiversity Areas.

The four-month timeframe for the analysis and KBA mapping and the effective use of the IUCN 2016 Standard was the greatest challenge both for the project team and for more than 50 contributing national experts from the seven countries.

The second greatest challenge was and still is that time passes and procedures apply differently among the seven countries – somewhere slower, somewhere faster. Data quality, availability and completeness vary from country to country and area to area, and major differences in the context of countries make a regional synthesis a challenge.

This preliminary version presents the synthesis of inputs from various experts and literature sources and will be refined to the extent feasible in the next few months before it is presented to the donors for approval in spring 2017. Much of the KBA data will be eventually available in the global KBA database, managed by BirdLife. There is, however, a need to continue to expand this initiative and to update the analysis of conservation priority sites and species as new information comes to light.

### 3. BIOLOGICAL IMPORTANCE OF THE HOTSPOT

This chapter describes the geography, climate, and biological history of the hotspot; and provides a summary of species diversity, levels of endemism, and global threat status among major taxonomic groups in the hotspot. It also describes ecosystem services.

Mountain regions are crucial to the maintenance of the natural and agricultural global biodiversity. The vertical distribution of natural species by elevation results in a wide range of species and ecosystems spread over a relatively small surface area. Endemic species find homes in isolated islands of mountain habitat with characteristics conducive to unique life forms and varieties.

#### 3.1. Geography, Climate, and History

The Mountains of Central Asia hotspot consists of two of Asia's major mountain ranges, the Pamir and the Tien Shan. These are situated within southeastern Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, northwestern China, northeastern Afghanistan, and a small part of Turkmenistan. The total area covered is about 860,000 square kilometers [update the area after final contours are produced]. The highest peak, Kongur, in the Chinese Pamir, rises to 7,719 meters. Glaciers in the hotspot cover about 35,000 km<sup>2</sup>.

The mountains were mainly formed by folding due to tectonic movements during the Caledonian, Hercynian, and Alpine orogenic (or mountain-building) periods. Some features also result from faulting and from volcanic activity. The hotspot borders several major deserts, such as Taklamakan and Kyzylkum.

The Pamir was known to early Persian geographers as Bam-i-Dunya, or "roof of the world" and is situated at the center of several great ranges. The Tien Shan, or "celestial mountains", lie adjacent to the north, the Hindu Kush to the southwest, the Karakoram to the southeast, and the Kun Lun Shan to the east. The Pamir extends east to the isolated Muztag Ata Massif in western China and south to the Wakhan Valley of northeastern Afghanistan. The northern rim of the Pamir is formed by the Trans-Alai Range that drops steeply to the Alai Valley, a deep fault trench carrying the waters of a major tributary of the Amu Darya, and dividing the Pamir from the Tien Shan.

The central parts of Pamir have a mean elevation of over 4,000 meters and parts of it are plateau-like in character. The surface is crossed by broad, shallow, valleys or *pamir* that give the name to the whole range. The western and eastern parts of Pamir, by contrast, are characterized by sharp ridges and steep slopes cut by deep valleys and gorges. They have great variation in elevation and typical alpine relief. The Pamir includes the Fedchenko Glacier, which is more than 70 kilometers long and one of the longest glaciers in the world outside the polar regions.

Several mountain ranges – Alai, Hissar, Zeravshan and Turkestan – lie between the Pamir and the Ferghana Valley, a deeply downfaulted basin, about 300 kilometers long and 150 kilometers wide. The Ferghana Valley extends into Uzbekistan, Kyrgyzstan and Tajikistan, and is the one of most densely populated and ethnically diverse regions of Central Asia, with an average population density of 350 persons per square kilometer. Some districts exceed 1,000 persons per square kilometer, and in 2015 the total population in the valley and nearby mountains exceeded 15 million.

To the north of the Ferghana Valley, the Tien Shan – Chinese for "heaven" or "sky" –



Mountains extend for 2,500 kilometers from west to east. Tien Shan is sacred in Tengrism, and its second-highest peak (6,995 meters) is known as Khan Tengri, which may be translated as "Lord of the Spirits". The Tien Shan are made up of a complex series of ranges and are around 300 kilometers wide in the center, narrowing at the eastern and western ends. The highest peaks are located in a central cluster on the borders of China, Kyrgyzstan, and Kazakhstan, and include Mt. Tomur at 7,439 meters (also called Janysh/Pobeda in Kyrgyzstan). The Inylchek Glacier, over 50 kilometers long and the largest in the Tien Shan, is also located in this part of the range.

Across the fertile Ili Valley, the Borohoro Shan links the Dzungar Alatau (4,464 meters) Range to the Tien Shan. Local glaciers occupy more than 10,000 square kilometers and occur along most of the range, east to the Bogda Shan in the Chinese Tien Shan. The central Tien Shan, with a mean altitude of over 3,000 meters, contains a high, uplifted massif that shares some of the same landscape features as the central Pamir. On the opposite side of the Tien Shan, lower arid ranges such as the Nuratau, Chu-Ili, and Karatau run away northwestwards into Central Asia's deserts. The Tien Shan drains mainly to the north, and the many streams plunging down the steep northern slopes have formed alluvial deposits on the plains below. These deposits provide sites for settlements, and several major population centers are located there.

The Pamir Mountains of Tajikistan and China join the Tien Shan in Kyrgyzstan in the north and the Hindu Kush Mountains in Afghanistan and Pakistan in the south, and contain some of world's highest peaks including the Kongur, which rises to 7,719 meters in China, and Somoni Peak, at 7,495 meters in Tajikistan. The largest river of Central Asia – the Amu Darya – has its origins in the Pamir and Hindu Kush with deep valleys, spectacular gorges and traditional settlements nestled on alluvial fans. People living here in the Badakshan and the Wakhan are among the most isolated and impoverished in the hotspot, and depend largely on subsistence agriculture.

Glaciers cover 4 percent of Kyrgyzstan and 6 percent of Tajikistan. They are also present in Kazakhstan, Uzbekistan, Afghanistan and northwest China. In total they cover an area of 12,000-15,000 km<sup>2</sup> within Central Asia plus 15,000-20,000 km<sup>2</sup> within the Chinese part of the hotspot. Melt water from snow, glaciers and permafrost supplies about 80 percent of the total river runoff in the high mountains of Central Asia. Glaciers are crucial to the agricultural economy of the region. They produce water in the hottest and driest period of the year – summer – and compensate for low precipitation.

The climate in this region is arid. The Tien Shan acts as a climatic divide and intercepts moist winter air from the north and west, and prevents it from reaching the hyper-arid Tarim Basin to the south. Precipitation falls mainly in winter and spring, and varies from over 1,000 mm in the Hissar and Ferghana Ranges in the west of the hotspot, to below 100 mm in the Pamir plateau. The southwest of the area – the western parts of the Tien Shan and of the Pamir – is influenced by subtropical air and also enjoys the mild winters. Temperatures decrease to the east, although there are considerable variations due to altitude. The high plateaus of the Pamir and Tien Shan are the coldest areas, having an annual mean temperature below zero and a very short growing season. Winter temperatures there may reach -40°C, and numerous patches of permafrost occur.

The Tien Shan and the Pamirs feature contrasting climates from harsh and dry in the interior and in the eastern corners (below zero annual surface temperatures; 100-300

mm average precipitation, mainly in summer) to more humid conditions and warmer temperatures in the western parts (over 1,000 mm annual precipitation, mainly in winter and spring). Most high mountains consist of barren ground, glaciers and other environments inhospitable to humans, but home to wild animals such as the Marco Polo sheep and the snow leopard. Mountains with more favorable climatic conditions possess fine grasslands and forests.

The Nuratau, Chatkal and Hissar-Turkestan mountain ranges of Uzbekistan are covered by protected areas, feature well-preserved juniper forests, and are important sources of water for downstream cities and oases.

Arable lands occupy less than 0.5 percent of the total area in the Tajik Pamirs, and pastures another 12.0 percent. In the Tien Shan Mountains of Kyrgyzstan, the proportion of pastures and arable lands is higher. Only half of Kyrgyzstan's land area and less than one third of Tajikistan's land area is suitable for agriculture, mainly for grazing. Croplands and gardens occupy less than 7 and 5 percent of their land areas, respectively. Other lands are considered not suitable for agriculture due to harsh climate, poor soils, and the predominance of rocks and glaciers. Nevertheless, a majority of the mountain communities of Central Asia practice agriculture – principally cultivating cereals and vegetables, gardening, collecting forest products and extensive livestock grazing on a wide range of pastures. Tourism, mining and trade form important economic sectors that have been gathering momentum in the mountain regions over the past 20 years. Infrastructure development has likewise experienced growth. All of these activities contribute to the revival of the ancient Silk Road in the modern age of globalization.

### **3.2. Habitats and Ecosystems**

Forests and shrub lands in the mountains of Central Asia cover about 5 million hectares (add data on Chinese part), including 2.5 million hectares of coniferous forests, and about 350,000 hectares of globally significant fruit-and-nut forests comprising walnuts, almonds, pears, apples, cherries and pistachios. Mountain forests provide invaluable watershed protection and erosion control, and contribute to the regulation of water resources by decreasing or smoothing runoff – with a corresponding decrease in erosion – and by retaining groundwater. They also provide mountain people with a rich source of the fuelwood essential to the heating of living spaces, the cooking of food and the purification of drinking water, and with timber and other forest products such as wild fruits, nuts and medicinal plants for subsistence or trade. A relic species of Tien Shan spruce forms a unique and spectacular forest belt in the Tien Shan Mountains.

The geological origin of the mountains, the wide range of elevations, and the extreme climatic variation have combined to produce great landscape and biotic diversity. The number, extent, and sequence of vegetation zones vary across the hotspot depending on temperature and moisture gradients, slope aspect, and altitude and latitude. Both Tajikistan and Kyrgyzstan, for example, identify 20-25 ecosystem types within their territories (reference), but classifications of ecosystems vary both within countries and between countries, so it is difficult to make a universal comparison. This section summarizes the ecosystems in the hotspot by sorting types into larger groupings. At lower altitudes and in the foothills, dryland ecosystems prevail. At medium altitudes, grasslands, shrubs and forests are widespread. Meadows and tundra-like ecosystems are

found in the high mountains.

### **3.2.1. Deserts, Semi-Deserts and Arid Steppes**

Desert, semi-desert, and arid steppe vegetation types predominate on all the lower slopes, foothills, and in some of the outlying ranges. Common plants here include species of widespread genera such as *Artemisia*, *Salsola*, and *Ephedra*, as well as annual grasses such as *Poa* and *Festuca* spp. In the Ili, Amu Darya and Syr Darya river valleys and a few other places, patches of riverine woodland survive, composed of poplar (*Populus* spp.), eleagnus, tamarisks (*Tamarix* spp.), and willows (*Salix* spp.) (Mittermeier et al. 2004).

### **3.2.2. High steppes**

Steppe communities, dominated by various species of grasses and herbs, occur at higher altitudes. A distinctive type of tall-grass steppe, characterized by *Elytrigia trichophora* and *Hordeum bulbosum*, occurs in the western Tien Shan and Pamir. Shrub communities are widespread in the lower steppe zone and may form dense thickets in gorges. Species present include hawthorns (*Crataegus pontica*, *C. turkestanica*), *Cotoneaster melanocarpa*, *Euonymus semenovii*, *Lonicera* spp., *Rosa* spp., and *Berberis* spp., with some pistachio (*Pistacia vera*) and hackberry (*Celtis caucasica*). The area occupied by shrubs has declined markedly due to cutting for fuelwood (Mittermeier et al. 2004).

### **3.2.3. Forests**

#### **Walnut and Fruit**

A type of wild walnut-fruit forest unique to Central Asia grows above the steppe zone in warm, sheltered places in the Pamir and Tien Shan. These are diverse and are composed of walnut (*Juglans regia*), almonds (*Amygdalus communis* and *A. bucharensis*), pears (*Pyrus korshinskyi* and *P. regelii*), plums (*Prunus sogdiana* and *P. ferganica*), cherry (*Cerasus mahaleb*), and apple (*Malus sieversii*), along with maples (*Acer turkestanicum* and *A. semenovii*). A few Chinese walnut (*Juglans cathayana*) trees survive at one locality in the eastern Tien Shan. This valuable and ancient forest type contains ancestors of domestic fruit varieties and is an important storehouse of wild genetic diversity. Some of the surviving walnut trees are estimated to be 500 years old. The area occupied by this habitat has greatly declined, with around 90 percent lost during the last 50 years (Mittermeier et al. 2004).

#### **Spruce**

Spruce forests occur on moist northern slopes of the Tien Shan, the only coniferous forest type in the mountains of Central Asia. These occur sporadically along most of the range, east as far as the Karlik Tag. They grow in a broad altitude band between 1,700 meters and 2,700 meters and are dominated by the endemic Schrenk's spruce (*Picea schrenkiana*). Some silver fir (*Abies semenovii*) occurs and associated species include the endemic Tien Shan rowan (*Sorbus tianshanica*), aspen (*Populus tremula*), willow (*Salix xerophila*), and birches (*Betula* spp.). Stands of closed-canopy forest are found in patches of varying size, with the largest on the Kyrgyz Range. More open stands also occur in a forest-meadow mosaic (Mittermeier et al. 2004).

#### **Juniper**

Open juniper forest occurs widely between 1,000 meters and 2,800 meters. In the Tien

Shan it grows above the spruce belt and is composed of *Juniperus seravschanica*, *J. turkestanica*, and *J. semiglobosa* (Mittermeier et al. 2004).

### 3.2.4. Subalpine and Alpine Meadows

Subalpine and alpine meadows occur from 2,000-4,000 meters and above, mainly in the northern and western more humid parts of the hotspot. Plant cover is high, with a tight sward made up of grasses such as *Poa alpina*, sedges (*Carex* and *Kobresia spp.*) and carpeted with a rich variety of herbs including many endemic species. The fritillary (*Rhinopetalum stenanthrum*), gentians (*Gentiana spp.*), globeflower (*Trollius dshungaricus*), primulas (*Primula spp.*), tulips (*Tulipa spp.*), anemones (e.g., *Anemone protracta*), louseworts (*Pedicularis spp.*), and aconites (*Aconitum talassicum*, *A. leucostomum*) are prominent among them. These meadows are at their most attractive in early summer when the flowers are in full bloom. In drier areas of the Pamir and Tien Shan, the montane meadows are replaced by high-elevation steppes, characterized by grasses such as *Festuca valesiaca*, *Poa attenuata*, *Puccinellia*, sedges (*Carex* and *Kobresia spp.*), together with a sparse cover of xerophytic perennial herbs (Mittermeier et al. 2004).

### 3.2.5. High-Elevation Vegetation

Vegetation cover and plant diversity declines rapidly as one approaches the upper limits of plant cover, and cushion plants and those with low rosettes that can withstand the high winds, cold temperatures, and aridity become more common. *Acantholimon diapensioides* is the most widespread cushion plant and species of *Saxifraga*, *Androsace*, *Rhodiola*, *Saussurea*, and *Tanacetum* are also frequent. At 4,000 to 4,500 m, even more hardy perennials are found, such as *Thylacospermum caespitosum*, the large, tight cushions of which resemble a moss more than a herbaceous plant, and *Dryadanthe tetrandra*. Snow patch plants also include attractive species, such as the alp lily (*Lloydia serotina*), the large, pale blue and white globeflower (*Trollius lilacinus*), and several crucifers (*Draba spp.*). At such high elevations the vegetation has a tundra-like character similar to Tibet, with sedge meadows dominated by species of *Kobresia* and *Carex* in areas along valley bottoms. Above this, there are only a few lichens and rare algal films on some glaciers (Mittermeier et al. 2004).

## 3.3. Species Diversity and Endemism

The mountains of Central Asia harbor genetic resources of the wild species of several domesticated plants and animals such as wheat, apples, almonds, walnuts and pistachios, as well as horses and goats, and are host to at least 20-30 distinct ecosystems and 4,500–5,500 species of vascular plants, almost one quarter of which are endemic to the region (Mittermeier et al. 2004).

**Table 1. Species diversity and endemism in the hotspot by taxonomic group**

Taxonomic Group	Species	Endemic Species	Percent Endemism
Plants	5,500	1,500	27.3
Mammals	143	6	4.2
Birds	489	0	0.0
Reptiles	59	1	1.7
Amphibians	7	4	57.1
Freshwater Fishes	27	5	18.5

### 3.3.1. Plants

The flora of the Mountains of Central Asia is a mix of Boreal, Siberian, Mongolian, Indo-Himalayan and Iranian elements. There are more than 5,500 known species of vascular plants in the hotspot, about 1,500 of which are endemic. There are also 64 endemic genera, including 21 from the family Umbelliferae and 12 from the family Compositae. The endemic flora includes several tree species, grasses (such as *Atraphaxis muschketovii* and *Stipa karatavica*), and numerous herbs. There are many species of wild onion, including *Allium pskemense*, a very rare large onion found only in a small part of the Pskem Range of the Western Tien Shan (Mittermeier et al. 2004).

More than 16 endemic species of tulip grow in the steppe and meadow zones of the mountains of Central Asia. The largest of these is the rare, brilliant orange-red Greig's tulip (*Tulipa greigii*), often known as the king of the tulips, which is only found in western Tien Shan. Collecting for horticulture and decoration has led to the decline of many of the hotspot's tulip species (Mittermeier et al. 2004).

### 3.3.2. Mammals

Six of about 140 mammals found in the hotspot are endemic: Menzibier's marmot (*Marmota menzbieri*, VU), found only in the western Tien Shan above 2,000 meters, and Ili pika (*Ochotona iliensis*, VU), a small species of lagomorph found only in the Chinese portion of the Tien Shan; two ground squirrels (*Spermophilus ralli* and *S. relictus*); the Pamir shrew (*Sorex bucharensis*); and the Alai mole vole (*Ellobius alaicus*, EN) in the Alai Mountains of Kyrgyzstan (Mittermeier et al. 2004).

The hotspot also holds a variety of mountain ungulates, including three endemic subspecies of the argali wild sheep (*Ovis ammon*, VU), among them the Marco Polo sheep (*O. a. polii*), whose magnificent curling horns have made it a favored target of trophy hunters. The Siberian ibex (*Capra sibirica*) is the most numerous and most widespread species, occurring in all parts of the area above the tree line, while the blue sheep (*Pseudois nayaur*), a typical Tibetan and Trans-Himalayan species, reaches the southeast corner of the hotspot (Mittermeier et al. 2004).

Because of their location in the central part of the Asian continent, the mountains of Central Asia play an important connecting role in the distribution of many important montane Asian species. Perhaps the best-known symbol of this fauna is the snow leopard (*Uncia uncia*, EN), a species found in the alpine and subalpine zones of the hotspot. The species has declined here, as elsewhere, as a result of poaching for its valued fur and a depletion of its prey base through illegal hunting (Mittermeier et al. 2004).

### 3.3.3. Birds

Although nearly 500 bird species occur regularly in this hotspot, none are endemic to the region. Many species belong to genera typical of the high ranges of Asia, such as redstarts (*Phoenicurus*), accentors (*Prunella*) and rosefinches (*Carpodacus*). Coniferous forests on the northern side of the Tien Shan form the southern limits of several boreal species, including the black grouse (*Lyrurus tetrix*) and northern hawk owl (*Surnia ulula*), while desert birds, including the great bustard (*Otis tarda*, VU) and houbara bustard (*Chlamydotis undulate*, VU) occur in the low-altitude zones (Mittermeier et al. 2004).

The mountains of Central Asia are an important stronghold for birds of prey, with important breeding populations of several species, including the golden eagle (*Aquila chrysaetos*), the imperial eagle (*A. heliaca*, VU), steppe eagle (*A. rapax*), booted eagle (*Hieraaetus pennatus*), lammergeier (*Gypaetus barbatus*), black vulture (*Aegypius monachus*), Eurasian griffon (*Gyps fulvus*), Himalayan griffon (*G. himalayensis*), peregrine falcon (*Falco peregrinus*) and saker falcon (*F. cherrug*, EN).

#### **3.3.4. Reptiles**

Nearly 60 reptiles are found in the hotspot, though only one is endemic, a skink, *Asymblepharus alaicus*. Diversity is highest in the lower elevations, in desert and semi-desert areas. There are ten species of *Eremias* lizards and eight toad-headed agamas (*Phrynocephalus* spp.) (Mittermeier et al. 2004).

#### **3.3.5. Amphibians**

Although only seven species of amphibians have been recorded, four of them are endemic, including a salamander (*Ranodon sibiricus*, EN) found only in the Dzhungar Alatau in the Tien Shan. One recently described species, the frog (*Rana terentievi*) is known from hot springs of central Tajikistan (Mittermeier et al. 2004).

#### **3.3.6. Freshwater Fishes**

This arid hotspot has less than 30 freshwater fish species, five of which are possibly endemic. Endemism is centered in the Lake Issyk-Kul Basin, which lacks outlets to connect it with any other bodies of water. In addition, the Koytendag blind cave fish (*Troglocobitis starostini*) is found only in a cave system of the Koytendag Mountains in the southeast Turkmenistan (Mittermeier et al. 2004).

### **3.4. Ecosystem Services**

The mountains of Central Asia provide an astonishing array of essential ecosystem goods and services that serve not only the mountain inhabitants but also those in the lowlands and people around the globe. These goods and services, which fall into four broad categories – provisioning, regulating, cultural and supporting – include forest products and land for food production; watershed protection; habitat for flora and fauna of local and global significance; the regulation of natural hazards and climate; natural areas for leisure and recreational activities; and perhaps most important of all, the storage and release of water. In the Regional Sustainable Development Strategy of Central Asia (2009), the governments officially acknowledge the role of mountains as "water towers" and storehouses of biodiversity.

Most of the population of Central Asia relies on water that falls in the mountains, where it is stored until making its way downstream to population centers. Densely populated valleys and oases of the vast drylands of Central Asia depend on mountain water transported by numerous rivers and streams, especially the Syr Darya River, which arises in the Tien Shan Mountains, the Amu Darya, which arises in the Pamir. Each flows more than 2,000 kilometers to empty into the Aral Sea. Other major regional rivers originating in the mountains are the Tarim, Ili, Chu and Talas.

Overall, Tajikistan holds 40 percent, and Kyrgyzstan 30 percent, of the water resources serving the five Central Asia countries. These water resources also serve China and Afghanistan. Uzbekistan, with the largest share of population in the hotspot, is the biggest water consumer, in large part because of an economy based on irrigated

agriculture. With 90 percent of their water resources coming from mountains located outside their country borders, Uzbekistan and Turkmenistan, are highly vulnerable to water shortages, especially the downstream communities.

Mountains provide a profound sense of place, a source of inspiration and a rich cultural heritage. The degree of cultural diversity varies among the mountain regions of the world. People in isolated mountain areas of Central Asia, especially in the Pamir and Wakhan, differ from those in the main valleys, and communities tend to develop distinctive cultural identities, agriculture traditions and languages. In the modern period, however, mountain minorities lost some of their identities to the dominant influence of Soviet and Chinese cultures. Before the era of industrialization, spirituality was also common in mountain communities of Central Asia, where people regarded the mountains as living forces and sources of power or symbols of the sacred.

The rich and diverse cultures in the Mountains of Central Asia and the strong sense of place in the mountains attract visitors from around the world, and tourism offers an additional income source for mountain communities.

For residents of some of the region’s largest cities – Tashkent, Almaty, Bishkek, Dushanbe and Urumqi – the mountains of Central Asia hotspot provides fresh air and the breezes that disperse urban air pollution. Mountains and their refreshing lakes and white-water streams are among the most popular weekend destinations for urban residents. In addition to picnics, hiking or skiing in beautiful unspoiled highlands, the key mountain attractions include geothermal sources and spas, horse milk therapy and the sampling of diverse mountain honeys, local herbal teas and traditional products.

Governments in Central Asia are looking to follow the lead of other countries in formally evaluating the monetary value of national ecosystems and their benefits. This kind of assessment will help in determining how much should be invested in natural resources and biodiversity protection initiatives and may encourage further funding. If mountain regions can prove both the value and critical importance of their existence, downstream countries may also be encouraged to invest in highland areas. These activities are in line with the Nagoya Protocol and are beneficial in ensuring that the genetic resources of countries are valued, recognized and invested in accordingly.

**Table 1. Principal Ecosystem Services**

Type of Ecosystem Service	Examples
<b>Provisioning</b>	Fresh water Food Raw materials Medicinal plants
<b>Regulating</b>	Moderation of extreme events Prevention of erosion Carbon storage Local climate and air quality
<b>Cultural</b>	Spirituality and sense of place Inspiration Mental and physical health Recreation and tourism
<b>Supporting</b>	Habitats for plants and animals Maintenance of genetic diversity

## **4. CONSERVATION OUTCOMES**

[Explain the IUCN 2016 Standard and how it was applied in identifying KBAs]

[This section will be available in the second draft]

[See list of species and KBA outcomes in the annex and map]



## 5. SOCIOECONOMIC CONTEXT OF THE HOTSPOT

This chapter provides a socioeconomic overview of the hotspot and an analysis of how socioeconomic factors affect conservation outcomes. The analysis covers population demographics, income and poverty, the relationships between natural resources and the main economic sectors in the region, and the cultural differences that have relevance to conservation or the role of civil society.

### 5.1. Population

In each of the two mountain countries of the hotspot – Kyrgyzstan and Tajikistan – population numbers in 1950 were about 1.5 million. In 2016, the population of Kyrgyzstan reached 6 million and in Tajikistan 8.5 million people (400% and 550% increase as compared to 1950, respectively). By 2050, UN DESA (2015) estimates that Kyrgyzstan will have more than 8 million people and Tajikistan more than 14 million people because of improving quality of life and high birth rates.

The Mountains of Central Asia hotspot is now home to about 60-64 million people. Most are young (median age 17-25) and living along the main rivers or oases. By 2050 the population in the region may approach 90 million or more (UN DESA, 2015). The Ferghana Valley has the highest rural population density in Central Asia.

Nomads work the high mountain pasture of Kyrgyzstan and China, the semi-desert areas of Turkmenistan and Kazakhstan pursuing a centuries-old lifestyle reshaped by modern conditions. In addition to the capital cities and other urban centers, some areas such as the Ferghana and Zarafshan Valleys are a mix of urban and rural. The population in the rapidly growing Chinese area of the hotspot has jumped from about 1.5 million in 2000 to more than 3 million today in Urumqi city alone, which is the main city of Xinjiang Uyghur Autonomous Region and holds 15 percent of the population.

**Table \_\_. Population in the hotspot and the countries**

Country	Population* in the hotspot, million, 2015	Density* of population per km <sup>2</sup> , 2015	Population growth* annual %, 2015	% Population increase* 2000-2015	Rural population as % of total* (2015)
China	17.5-20	16-20	1.1	15	56
Kyrgyzstan	6	30	1.6	20	64
Tajikistan	8.5	60	1.9	30	73
Kazakhstan	6-7	8-16	1.1	20	50
Uzbekistan	22	180-200	1.1	20	50
Turkmenistan	0.050	10	1.3	20	90
Afghanistan	0.050	1-2	1-2	no data	100
<b>Total</b>	<b>60-63.5 m</b>	<b>70</b>			

Source: national and local statistics

\* Approximate figures for the hotspot (within administrative boundaries)

In addition to Urumqi, the hotspot contains such major urban population centers as Tashkent, Almaty and Dushanbe, but a significant portion of population in the hotspot is still predominately rural. The livelihoods of a large part of this rural population depend

on agriculture, which has direct impacts on biodiversity through use of agrichemicals and the expansion of the agricultural lands. In addition, a great many are also still dependent on wild resources for their basic needs and income – firewood, wild fruits and nuts, medicines.

In recent years, Central Asia has experienced several waves of migration and temporary displacement. Water deficits and drought in the Aral Sea region in the 1990s and again in 2000-2001 displaced many people (UNEP and ICSD 2006). The hardest hit area was the Amu Darya River delta. Most people eventually returned to their original homes, but many are considering permanent migration (UNESCO 2013). While these areas are far downstream from the hotspot, they depend on the ecosystem services – particularly the provision of water – that originate in the hotspot.

During the 1950s and the 1970s, the Soviets orchestrated the resettlement of the mountain dwellers of Tajikistan to the lowlands for the purposes of land development and cotton cultivation. Some of the migration was forced, and some voluntary, but in any case, whole mountain communities were abandoned for many years. At the time of independence, about half of these migrants from the resettlement program went back to their old villages. Civil unrest in the 1990s and the availability of wood for heating and land for food cultivation were additional factors encouraging people to return to the mountains (University of Central Asia *et al.* 2012).

The Soviet Union collapse led to a major deficit of jobs, and many men from mountain communities now travel to capital cities or to Russia or Kazakhstan to find work. This drain of young and middle-aged men from traditional mountain communities has had an impact on family structures and placed an additional burden on women, who increasingly take the lead in households, while village elders take on the roles usually played by younger men. In some poverty-stricken areas, women who are heads of households have also joined the labor migration. Civil unrest, instability and ethnic issues have also contributed to the emigration of skilled workers from Central Asia.

After independence, the exodus of Russians and Europeans from Central Asian countries, particularly in Tajikistan and Kyrgyzstan, changed the ethnic proportions of the countries' populations. The Russian language, which was quite common in the region two decades ago, is now rarely spoken and understood, mainly in cities. Legislation and national programs are available in Russian.

In a major shift since independence, immigration to Central Asia is now primarily associated with trade, and about three quarters of the immigrant population is Chinese (Azattyk 2013; Olimova 2012). Investment in development in such areas as energy, roads and mining increasingly comes from China, and many Chinese nationals now live and work in Central Asia. In northwest China, major inflow of laborers from mainland China has contributed to a booming population, agriculture and industries.

## **5.2. Income**

Shocks and overall economic decline characterized the 1990s – the first decade of independence in Central Asia. Civil war raged at the same time in Afghanistan. The following decade, when the countries of the region were beginning to find ways to move forward, coincided with a global economic boom. The countries rich in fossil

fuels benefited from growing demand and expanding manufacturing, while the other countries pursued new opportunities for labor migration and trade and services.

**Table . Economic statistics for the countries in the hotspot**

Country	Income Group	GDP per Capita*, 2015	GDP Growth (annual %, 2010-2015)	Net ODA Received (2014, Million*)	Net ODA Received as % of GNI, 2014
China	Upper middle	\$11,300**	8-12**	-960	0
Kyrgyzstan	Middle	\$1,100	3-8	624	8.6
Tajikistan	Middle	\$1,000	4-7	356	3
Kazakhstan	Upper middle	\$10,500	1-5	88	0
Uzbekistan	Middle	\$2,100	8	324	0.5
Turkmenistan	Upper middle	\$6,900	6-10	34	0
Afghanistan	Low	\$600	1-2	4,823	23.3

Sources: World Bank and national statistics

\* Current US dollars; \*\* Xingjian

### 5.2.1. Poverty

As geographically isolated, landlocked and impoverished countries with predominantly agricultural economies and rural populations, Tajikistan, Kyrgyzstan and Afghanistan are more impoverished and less developed than their neighbors.

Economic recession in the early years after the end of Soviet Union in Central Asia led to levels of poverty in the mountain countries as high as 75-80 percent (UNDP Kyrgyzstan 2002; UNDP Tajikistan 2012; UNECE 2013). Donor support was critical at the peak of the poverty and humanitarian crisis, especially in the Tajik Pamirs, and poverty levels have declined dramatically. Poverty levels in Tajikistan, which remains the most impoverished country in the hotspot, fell below 40-45 (UNECE 2013, UNDP 2016). In both Kyrgyzstan and Afghanistan poverty remains significant, but lower than in Tajikistan (UNDP, 2016). Poverty levels in Kazakhstan and Turkmenistan are below 5 percent (UNECE 2013). Unemployment remains a problem, and many farmers and pastoralists migrate to find work abroad or in large cities. In Uzbekistan, 15 years ago poverty levels were at 27 percent, but according to UNDP estimates, the rate fell below 15 percent (UNDP 2016).

**Table . Poverty and human development indicators in the hotspot countries**

Country	2014 Human Development Index Rank (out of 185)	Life Expectancy (Years)	Poverty, % (2012-2015)	2015 Adult Literacy Rate*	2014 Gender Inequality Index Rank (out of 185)
China	90	75.4	no data	96	40
Kyrgyzstan	120	70.4	35	99	67
Tajikistan	129	67	35-45	99	69
Kazakhstan	56	71.6	5	100	52
Uzbekistan	114	73.6	10-14	100	No data
Turkmenistan	109	66	5	100	No data
Afghanistan	171	51	35	38	152

Sources: UNDP, World Bank

\* Population 15+ years, %

Development indicators, such as income and literacy rates, are typically lower in remote areas, which are often also the site of concentrations of biodiversity and protected areas.

### **5.2.2. Remittances**

The Kyrgyz and Tajik republics under the Soviet Union had benefited from substantial budgetary support and the Soviet economic power and common markets. Soviet policies had led to a high level of social and economic development and strategic support for the populations, particularly those in the remote mountain areas, in terms of security, jobs, and the provision of food and fodder and energy supplies. The withdrawal of subsidies and the interruption of traditional trading links and markets led to rapid increases in unemployment and poverty.

Remittances from labor migrants account for a significant proportion of national incomes in the mountain countries, and improve economic security in the short run (ILO, 2010). The role of remittances has increased dramatically over the period 2000-2015 and has become the major source of income as well as the safety net for many households in Uzbekistan, Tajikistan and Kyrgyzstan. Almost 1 million Tajik citizens, 1.5-2 million Uzbek citizens and 0.5 million Kyrgyz citizens work in Russia. The value of remittances to Tajikistan officially reported by banks in 2010-2015 exceeded US \$2.5-3.5 billion per year. Remittances to Uzbekistan are even larger at US \$5-7 billion per year, but in proportion to GDP they are smaller. The effects of the 2008-2010 and 2015-2016 economic turbulence in Russia have affected the flow of remittances.

Tajikistan often tops the world ranking of countries relying on remittances from abroad – with an amount equal to almost half of the country's GDP (WDI). The share and overall amount of remittances in Kyrgyzstan is lower, but still significant – almost 30 percent of GDP. Total remittances sent by labor migrants from Russia to their home countries of Uzbekistan, Tajikistan and Kyrgyzstan exceeded US \$12 billion in 2013.

### **5.3. Reliance on Natural Resources**

The Mountains of Central Asia hotspot's abundant natural resources are the foundation for all important economic sectors. Rivers provide for hydropower development in the mountains and for irrigated agriculture in the lowlands. Windy canyons favor development of wind power. Rich oil, gas and coal reserves fuel the local economies of China, Kazakhstan, Uzbekistan and Turkmenistan and the mining sector is developing the vast mineral deposits that occur throughout the hotspot. The exploitation of these natural resources without regard for environmental consequences leads to degradation.

Water is the region's most precious resource, and Central Asia has long depended on irrigated agriculture for much of its food and fiber production. Wasteful water use practices and overuse of pesticides and mineral fertilizers – legacies of the Soviet era – continue to cause problems today. A high proportion of irrigation water is still being wasted: some drainage water flows into the desert and evaporates, and some returns to the rivers carrying up to 5-10 times its original salinity.

Most wildlife management and conservation areas are the responsibility of the states, but some hunting areas are privately managed by licenses. Many protected areas have low economic value, but their sheer size and the importance of the ecosystem services they provide makes the condition of these areas an important consideration in the context of conservation of biodiversity. Payments for ecosystem services (PES) have

been proposed as mechanisms to deliver better conservation by linking beneficiaries of an ecosystem service with providers via a mechanism to pay the people who manage the natural habitats that provide the service.

In some instances, the use of the land for biodiversity conservation may conflict with other prospective uses, especially mining, energy production and infrastructure development. The increase in size and diversity of protected areas across the hotspot is a positive trend and contributes to ecosystem resilience (FLERMONECA, 2015).

### **5.3.1. Agriculture**

As part of the transition from collective farming to a market economy, Central Asian governments launched a land redistribution process that resulted in agricultural lands passing into a quasi-private ownership or long-term private rental. This land rights transition turned the management of formerly collective farms over to individuals, villages or groups, and the number of farming units skyrocketed. Although the state retains official ownership, private management systems such as long-term individual leasing are now widespread. In 2014 the number of private farmers exceeded 350,000 in Kyrgyzstan, and 130,000 in Tajikistan. With the change in land ownership, the income gap widened between those who acquired sufficient land for crop management and domestic animals and those who did not. This problem is also relevant to Afghanistan.

Prior to the Soviet era in Central Asia and before the 1960s in the Chinese part of the hotspot, the mountain communities practiced primarily subsistence-based agriculture – livestock production in the Tien Shan, and a mixture of crop cultivation, gardening and livestock breeding in the Pamir – with lively trade between home-based agriculturalists and nomadic pastoralists. During the Soviet period the agricultural sector was transformed from a household-level system to a centrally planned large-scale production system. Over the last 20 years, the agricultural sector in parts of Central Asia has reverted to household-level agriculture, but in China, Uzbekistan and Turkmenistan, the state order and planning plays a significant role in agriculture sector development.

Because the Pamir dwellers raise more crops than livestock, they eat mainly vegetables, legumes and foodstuffs such as bread and noodles. The diet of the Tien Shan and Wakhan dwellers has a high proportion of meat and milk. Changes during the economic transition affected nutrition and led to a considerable reduction in food variety. Consumption of meat products, fruits and vegetables generally declined, while consumption of bread, potato and dairy products increased.

In the mountains of southern Kyrgyzstan and in the Ferghana Valley, unpredictable weather affects communities reliant on cash crops such as apricots and wild forest products as well as those relying on subsistence crops such as rice and grain. Rolling losses can affect entire provinces and lead to grievances and dissatisfaction. Nomadic communities in the interior and high mountain pastoral communities have suffered cattle losses related to winter weather.

### **5.3.2. Mineral Resources and Mining**

The mining sector in the region is relatively small in terms of workforce size, but generates significant tax revenues. In the mountains, the development of the mining sector has been significant in recent years, particularly in Kyrgyzstan, Tajikistan and China. In Kyrgyzstan, most of the large mineral reserves are in the high mountains

(above 2,500 meters), as they are in Tajikistan, where the mining reserves are less developed and the resources are not as well known.

Mining and metallurgy industries are the major cash sources for national budgets in both countries, contributing up to 50 percent of the national export earnings in Tajikistan (aluminum and gold) and up to 30 percent in Kyrgyzstan (mainly gold).

A series of changes in the operators of the mines, and local perceptions of broken promises, dubious hiring practices, compensation inequities and environmental damage have all hardened resistance to mining in Kyrgyzstan (Bogdetsky *et al.* 2012). The benefit-sharing arrangement between mining projects, central government and local communities remains a lingering cause of resentment. The conflict between the use of land for traditional pasture and grazing, nature conservation and for mining activities is also a source of friction in Kyrgyzstan. The melting of glaciers and permafrost in the mountains is complicating the infrastructure and waste management requirements of mining operations (Torgoev 2013).

Kyrgyzstan, which foresaw the mining and energy sectors as having significant development potential, moved to create conditions favorable to mining operators by enacting economic reforms and by allowing access to geological information. Currently many territories are licensed for mining activities. Tajikistan continues to consider its geological information semi-confidential, as in the Soviet era, and its legislation and the ease of doing business lags behind Kyrgyzstan's. As a result, Tajikistan has attracted fewer investors. Tajikistan had been famous for silver mining from ancient times, and a recent geological audit suggests that it has probably one of the largest silver reserves in world in Kuramin, Western Tien Shan. The government is in the process of requesting expressions of interest from interested mining companies.

Regulations on mining are sometimes contradictory to environmental protection priorities: mining is allowed in riverbeds and sometimes even in the buffer zones of protected areas. Local communities oppose mining developments in or near nature reserves and along rivers and springs where ecosystem damage caused by industrial operations could have negative implications. Residents fear their valleys will become polluted and people will stop buying their vegetables and other agricultural products. Some companies have extensively developed alluvial deposits in sensitive freshwater river ecosystems that provide clean water.

Kazakhstan, Kyrgyzstan, Tajikistan, Afghanistan are participating in an international initiative on transparency in extractive industries, and are working to involve as many mining companies as possible. The transparency initiative requires financial disclosure that shows how mining activities benefit governments. The initiative does not, however, require disclosure of how the activities may or may not benefit local communities.

In both Kyrgyzstan and Tajikistan, the environmental problems associated with the increase in mining and related activities are offset to some extent by the declines in all other industrial sectors. While the increase in mining increases potential threats to the environment, the reduction in industry reduces other threats.

Artisanal gold mining is not widespread in the hotspot due to tight governmental controls and regulations, but it exists in Afghanistan, Kyrgyzstan and China. Gold

helped mountain dwellers survive in the turbulent economic transition in the 1990s. For others it is an income supplement in winter months when agricultural activities are limited in the mountains. The increasing degree of labor mechanization and the use of mercury for fine gold extraction are growing threats to the mountain environment.

### **5.3.3. Energy**

Within the hotspot, the territories of Kyrgyzstan and Tajikistan have the largest hydropower potential, and both countries are working on policies and strategies to develop that potential on all scales. International organizations including the World Bank and the Asian Development Bank have demonstrated interest in the energy sector, and are active in promoting markets for energy generation and transfer. Energy-hungry neighbors, China, Pakistan, India and Afghanistan, are also interested in the prospect of benefiting from the development of Central Asia hydropower projects. Currently, Tajikistan has about 5,000 MW of installed hydropower capacity and Kyrgyzstan has 2,700 MW, less than 10 percent of their technically feasible hydropower potential. Russia, China and Iran are interested in investments in the hydropower sector. Planned and ongoing projects aim to further expand hydropower capacity on the rivers with existing power cascades, chiefly on the Vakhsh in Tajikistan and on the Naryn in Kyrgyzstan. Additional plans and projects contemplate development on unmodified major rivers such as the Panj and Zeravshan in Tajikistan and Sary-Djaz in Kyrgyzstan.

In view of the growing national energy demand, authorities have chosen to increase power generation capacities using both renewable (hydropower and wind) and non-renewable energy sources such as coal, deposits of which are accessible and affordable in many of the hotspot countries. Coal-fired plants would serve as a short-term solution to overcome energy deficits and increase energy security. The emerging trend towards increasing use of coal for power generation and in cement production and other industries is a concern, however, since this use adds to the national carbon footprint and causes local air pollution.

China is increasingly present in the renewable energy market of Central Asia, and many small and medium scale hydropower stations, wind energy and solar power installations are being built with Chinese investment and technology. The region is also interested in Chinese investments in coal both for power plants and for use in cement production particularly in Kyrgyzstan and Tajikistan. Coal and oil reserves in the Chinese part of the hotspot are important in China's energy development plans.

Like in the mining sector, the development of the energy sector is rife with controversy and competing interests – upstream and down, local and international. The Rogun Dam on the Vakhsh River in Tajikistan is a case in point. Slated to rise more than 300 meters high, the Rogun Dam is a source of tension between Tajikistan and Uzbekistan. To facilitate the development of the project and to attract international investors, the World Bank has provided assistance in the technical, economic and socio-environmental assessments. In the absence of international investors, Tajikistan sought to develop the project as a state-owned venture financed out of the national budget.

Finally, corruption is reducing the development potential for the largely state-owned energy sector. Illegal connections to the grid are not uncommon, and the industrial sector enjoys privileges while some communities have no service. For the past 20 years, the system has operated without transparency and without consultation with CSOs.

#### **5.3.4. Water-agriculture-energy nexus**

The tension between the highlands and the lowlands over the use of water for energy production and irrigated agriculture is a crucial issue in the region. The effects of climate change are likely to reverberate throughout the water-agriculture-energy nexus, and make a difficult situation worse.

The water resources in the Aral Sea basin and Tarim River basin are already used to such an extent that any significant stress resulting from weather extremes and climate change affects all users, especially those downstream. The water infrastructure in Central Asia was designed in the Soviet era for the region as a whole, but since independence each country owns and maintains its infrastructure with the exception of some cross-border canals, key reservoirs and pumping stations still held in common or operated jointly (ENVSEC 2011).

The downstream states prefer to maintain the old status quo in regional water management, counting on the historical hydrology baseline, water allocations and arrangements. The upstream states opt for revision of the water management schemes in line with new political and economic realities (ENVSEC 2011). In line with the growth and development of the national economies in the region, the countries are pursuing national and sector-level water reforms in the national interest. At the regional level, however, water reform discussions are in stalemate.

The increasing demand for cheap hydropower is creating an opportunity for countries with abundant hydro sources to sell power to both close and distant neighbors, but current plans for significant growth in the capacity to produce hydropower and regulate water flow may intensify the upstream-downstream tensions.

In the past 25 years a lack of coordination or willingness to coordinate over water releases balancing hydropower against irrigated agriculture demands resulted in downstream flooding episodes in winter and deficits in summer. Upstream countries suffer from energy deficits or economic losses due to the limitations of energy exchange. As a result, plans for further hydropower developments in the upstream countries are viewed with suspicion by the downstream states, although mutually beneficial solutions exist. When the countries discontinued their energy exchange system, new markets formed, but the connections are poorly developed. Trading fossil fuels for electric power or for the provision of water services is still a possibility. Whether the countries continue to pursue their own narrow national interests or take a collaborative approach at the regional level may determine whether the tensions escalate or diminish (ENVSEC 2011).

#### **5.3.5. Forestry**

The percentage of forest cover in Central Asia is relatively low – from 2.9 percent in Tajikistan to 8.8 percent in Turkmenistan – and the lowland forests tend to be sparse while the mountain forests are denser. Most natural forests and plantations remain state owned. Individuals and associations manage a growing number of state-owned fruit and nut forests and plantations through long-term leases from the state. This practice has resulted in a boom in fruit and timber plantations, reduced deforestation and increased reforestation, all of which provide the benefits of carbon sequestration. On the other



hand, the fragmentation of these areas can occur if leaseholders either fence their areas or cut artificial barriers to secure their holdings, and the conversion of forest lands to other uses remains a possibility.

**Table \_\_. Forest cover**

Country	Total Forests (2015)		Forests within the hotspot
	Km <sup>2</sup>	% of land area	Km <sup>2</sup>
China	2,100,000	22	23,350 (Xinjiang)
Kyrgyzstan	8,360	4.4	8,360
Tajikistan	4,080	2.9	4,080
Kazakhstan	34,220	1.3	No data
Uzbekistan	30,450	7.2	No data
Turkmenistan	41,270	8.8	No data
Afghanistan	13,500	2.1	No forests in Wakhan

Source: World Bank, FAO

Fuel wood is the principal source of energy for cooking and heating in the mountains, due to the lack of affordable alternatives, and harvesting it is widespread throughout the hotspot and probably the single largest use of woodlands.

There are no known forest certification schemes in the mountains of the hotspot countries, although the Forest Stewardship Council has initiated some work in Central Asia to introduce more sustainable, “eco-friendly” use and management of non-timber forest products (NTFPs). Overall figures on the value of the market for non-timber forest products across the hotspot are not available, but household collection of such products is significant and its economic value believed to be high.

### **5.3.6. Tourism**

Hot springs and skiing resorts in the hotspot are popular destinations for vacationers and those seeking the healing powers of the waters and mountains. Tourism development in Uzbekistan is mostly associated with the cultural heritage sites. Hunting tourism is common in Tajikistan and Kyrgyzstan. Key nature tourism destinations within the hotspot include both the Pamir and Tien Shan Mountains. Many of the most visited sites are protected areas, which highlights their importance as a source of tourism revenue. Many scenically beautiful and biodiversity rich montane protected areas in the hotspot need further investment in facilities and better promotion to attract additional tourists. Security concerns are impeding many interested tourists from visiting Afghanistan.

The Tien Shan and Tianchi Lake National Nature Reserve is about a one-hour drive from the city of Urumqi, and every day bus after bus ferries visitors – who number in the thousands per day – from the city and other parts of China to the reserve. This is a much higher level of visitation than that in Central Asia, and signifies the strong local interest in environmental protection.

## **5.4. Cultural Distinctions**

### **5.4.1. Ethnicity**

The main ethnic groups in the region are Kazakh, Kyrgyz, Uzbek, Uyghur, Han, Tajik and Wakhi. The Kazakh, Kyrgyz, Uzbek, and Uyghur live throughout the mountains of Central Asia and speak a series of Turkic languages. The other major ethnic groups are the Tajiks, who inhabit the Pamir in Tajikistan, Afghanistan and China. They are subdivided into a number of groups. Wakhi-speaking communities live in Wakhan of Afghanistan. Added to these are many Eastern Europeans (Russians, Ukrainians) in the Central Asian part of the hotspot and Han Chinese in the Chinese part, especially in major cities and industrial areas.

In Kyrgyzstan, the Uzbek minority was displaced in ethnic clashes associated with the 2010 revolution. Forested areas in southern Kyrgyzstan were home to a large proportion of Uzbeks, who harvested forest products for consumption and export. In China, some tensions involving ethnic factors have occurred, too.

### **5.4.2. Religion**

Islam – the most practiced religion in the hotspot – grew and expanded over time (Munster and Bosch 2012; CORE IFSH 2012) and range from the traditional to the modern. Independence saw the rise of Islam in Central Asia, particularly in Tajikistan and the mountain regions where the roots of the religion go deep. Differences in belief regarding whether government should be secular or theocratic have been a source of civil conflict and difficult relations. Extreme Islamic groups across Central Asia and Afghanistan have used the mountains as hiding places. The rise of radical movements has led to outbreaks of violence in some places (Munster and Bosch 2012). The threat of fundamentalism remains among the common regional security concerns expressed by the Central Asian countries (Munster and Bosch 2012; Zarifi 2011).

The Tien Shan communities have deep roots in Tengriism, an ancient religion that incorporates elements of animism, and that focuses on living in harmony with nature. Sulaiman-Too Sacred Mountain in Osh, Kyrgyzstan, is a United Nations Educational, Scientific and Cultural Organization (UNESCO). Mountain areas of Central Asia have numerous mazars, which are among the distinguished pilgrimage sites in the region.

### **5.4.3. Language**

Russian remains the international language of Central Asia and is also spoken in northwest China thanks to trading links. In Kyrgyzstan – where the links to Russia are historically stronger – the Russian language remains known in both metropolitan and rural areas. Russian was common in Tajikistan and Uzbekistan two decades ago, but now, because of the stronger national identity and legislative requirements regarding language, Russian is fading away. Russian is the language of regional meetings. Chinese is becoming more popular among students and traders who plan to develop business or participate in China-linked trade, mining and energy projects.

Each country in the hotspot has its own national language, in each case the language of the majority ethnic group. English language skills are generally lacking, particularly in rural populations, in government institutions and local CSOs.

#### **5.4.4. Traditional Practices**

[Explain diversity of local ethnic groups/peoples]

In the Soviet era, there was no demand for the animal hides and wood-carving products traditionally made in the mountains, and the skills in those traditional crafts significantly diminished. Now, however, with the new market opportunities and the growth of tourism in the region, the traditional mountain crafts are experiencing a resurgence, and many communities are specializing in traditional crafts. [Examples]

#### **5.5. Gender Issues**

The role of women in the region varies from strong leadership in the north to more traditional in the south.

In Kazakhstan and Kyrgyzstan with nomadic roots, the relatively independent attitude of women is evidenced by the prominent leadership roles women take in business and public affairs. In these countries, women are players in determining the response to climate change, and may be catalysts for climate action. In both countries, women hold primary responsibility for environmental and climate change policies, and many experts, leaders and advocates in environmental sector CSOs are women.

In the southern countries – Tajikistan, Turkmenistan, Uzbekistan and Afghanistan – women tend to have more than three or four children and to stay at home, often in situations where men in the family are labor migrants. Turkmenistan has identified human health as a priority area in its response to climate change, but the other southern countries may not yet fully recognize the potential effects of climate on human health. In countries and areas with incomplete families – with a high proportion of male labor migrants, for example – women and children are sometimes face natural disaster risks alone, and may be more vulnerable.

The impacts of climate change are different for men and women. In rural areas in the mountain countries in particular, where many men work abroad and women take care of the families, women are more vulnerable to climate change. High temperatures coupled with unreliable energy or water supplies leads to high risks to maternal health. Usually the women are responsible for provision of clean drinking water and food for the family, household and animals, and the time spent on these tasks is increasing. At the same time, women are inadequately represented in the decision-making structures.

#### **5.6. Links to the CEPF Monitoring Framework**

## 6. POLICY CONTEXT OF THE HOTSPOT

This chapter reviews the main environment-related national, regional and global policies and agreements being applied in the mountains of Central Asia hotspot. It illustrates how development strategies of hotspot countries affect biodiversity conservation. It provides an overview of the governance in each of the countries, details economic development policies, biodiversity strategies, and assesses how the policy context affects biodiversity conservation and how it could influence CEPF investment strategies and approaches.

### 6.1. Governance

[This section will be available in the second draft, December 2016]

#### 6.1.1. Political conditions

China

Kyrgyzstan

Tajikistan

Kazakhstan

Uzbekistan

Turkmenistan

Afghanistan

#### 6.1.2. Conflict and Security Situation

In the densely populated Ferghana Valley shared by Uzbekistan, Kyrgyzstan and Tajikistan people historically traded broadly across borders. Over the last 10 years, however, Uzbek-Kyrgyz and Tajik-Kyrgyz ethnic clashes have occurred in Osh, Jalalabad and Vorukh in southern Kyrgyzstan, and violence in Andijan of Uzbekistan. The underlying causes included trade and access to roads, pastures, land and water.

The border between Tajikistan and Afghanistan extends more than 1,300 kilometers. Afghanistan is a least developed country, and the mountain border is volatile, unstable and difficult to access. While this area has potential KBAs, it is lacking the data necessary for the analysis, and is unsafe for the implementation of prospective biodiversity projects, except for the Wakhan Valley and National Park.

[Security restrictions in northwestern China / Xingjian]

The region has a history of conflicts related to mining, primarily in Kyrgyzstan, which witnessed a number of sometimes-violent protests. These protests have roots in social and governance issues, but environmental factors have become more prominent.

### 6.2. Policies on Economic Development

[Further details in this section will be available in the second draft, December 2016]

#### China

Development of part of the Chinese portion of the hotspot is dominated by the China Western Development strategy, which aims to improve the economic situation of western China through capital investment, and has supported infrastructure development. Acknowledgement of the importance of limiting the environmental damage of development is becoming increasingly widespread in China.

Government staff with responsibility for protecting biodiversity are often poorly paid. Nations generally have good legal bases for biodiversity conservation; limited budgets and poor governance, however, mean that these laws are often not implemented adequately.

Kyrgyzstan  
Tajikistan  
Kazakhstan  
Uzbekistan  
Turkmenistan  
Afghanistan

### **6.3. Management of Natural Resources**

[Further details in this section will be available in draft 2, December 2016]

A framework of legislation and policy on biodiversity conservation exists throughout the hotspot, but there are limitations to the successful implementation of environmental legislation. In many cases, responsibility for biodiversity conservation is divided among multiple agencies, and overlapping authority and an absence of institutional coordination are common. Government institutions mandated to protect biodiversity are understaffed and operate with insufficient budgets, and employees, particularly in remote areas, often lack the knowledge and skills necessary for effective conservation. In addition, some government agencies tasked with biodiversity conservation suffer from weak governance. Poor pay and conditions, low motivation and training, and lack of appropriate incentive mechanisms, lead to underperformance.

Piloting improvements to legislation, enhancing interdepartmental cooperation, and delivering training for protected area staff are examples of the types of action that can be taken by civil society to enhance implementation of legislation on the ground. Efforts to improve capacity of national staff should not be restricted to civil society.

China  
Kyrgyzstan  
Tajikistan  
Kazakhstan  
Uzbekistan  
Turkmenistan

#### **Afghanistan**

The entire Wakhan Valley of Afghanistan is a national park with a modern management plan to be launched in 2017. A range of endemic species, mostly plants, make the park an important KBA, but the presence of the snow leopard in significant numbers and density really distinguishes the area. On the basis of the snow leopard alone, the Wakhan Valley qualifies as a KBA. The willingness of Afghanistan to cooperate with Tajikistan on the common environment and hydrology issues bodes well for the development of appropriate cross-border cooperation and is supported by the MoUs.

## 6.4. Legal and Institutional Policy Framework on Conservation

[Further details in this section will be available in the second draft, December 2016]

All hotspot nations have a set of laws and policies that support biodiversity conservation. Central to these is the legislation supporting the creation and management of protected areas, and wildlife protection laws. In addition, states have other legislation that affects biodiversity, including environmental regulations and pollution controls. This legislation is implemented by a diverse array of different ministries, agencies and institutions. The legal framework for biodiversity conservation in the hotspot is robust, but coordination between institutions is not always well established and effective implementation of laws is sometimes lacking.

Table \_\_. Laws on nature protection and conservation

Country	Ecological code / Framework	Protected areas law	Flora and fauna law	Forest code / law	Hunting law(s)	EIA law or regulations
China	X	X	X	X	X	X
Kyrgyzstan	X	X	X	X	X	X
Tajikistan	X	X	X	X	X	X
Kazakhstan	X	X	X	X	X	X
Uzbekistan	X	X	X	X	X	X
Turkmenistan	X	X	X	X	X	X
Afghanistan	X					X

Source: compilation of country information

Protected areas form the heart of biodiversity conservation strategies in the hotspot. A total of XXX protected areas have been designated in the hotspot. Overall, around XXX percent of the hotspot is covered by protected areas, but the national coverage is highly variable. XXX has the greatest coverage, with over XXX percent of the area protected. XXX, however, has only placed around XXX percent under protection. Across the hotspot, protected area coverage is more complete in mountainous area.

### China

China's State Council, appointed by the National People's Congress, has ultimate responsibility for the country's environment. The State Council authorizes the Ministry of Environmental Protection (MEP) to coordinate and monitor the management of biodiversity conservation. Its responsibilities include formulating laws, regulations, and economic, and technical policies, compiling national programs and technical specifications, formulating management regulations and evaluation standards for nature reserves, and supervising the conservation of rare and threatened species. In addition, MEP is responsible for the implementation and supervision of international environmental conventions, and represented the government in drafting and revising the CBD.

Responsibility for managing the majority of forests and other protected areas lies with the State Forestry Administration. Several other institutions also have biodiversity conservation responsibilities, including the Ministry of Agriculture, the Ministry of

Construction, the Ministry of Water Resources and the Chinese Academy of Sciences. One source of independent expert advice to the State Council in policy development and planning is the China Council for International Cooperation on Environment and Development, a high-level, nongovernmental consultative forum created in 1992, consisting of senior Chinese officials and experts, together with high-profile international experts.

Key legal documents for China include laws on water pollution (1984), forests (1984), fisheries (1986), air pollution (1987), and water (1988). Subsequent to the passing of the Environmental Protection Law there have been laws passed on other environment protection issues, such as water and soil conservation (1991), energy utilization (1997), and land resource administration (1998). The Standing Committee of the People's Congress has promulgated all these laws. In addition, the State Council has passed a key resolution on environment protection (1996) and regulations on environment protection in construction (1988) (Habito and Antonio 2007).

Kyrgyzstan  
Tajikistan

## **Kazakhstan**

In Kazakhstan, the two ministries responsible for biodiversity conservation are the Ministry of Agriculture (MoA) and the Ministry of Energy (MoE). Responsibility for environmental management is divided among several government institutions, including XXX, XXX. Of these institutions XXX has the main responsibility for forest management, with the Forest Department being responsible for developing the national protected area system and enforcing wildlife protection regulations. In addition, there are a number of government research institutes whose work supports biodiversity conservation and protected areas planning, including the Institute of XXX.

Uzbekistan  
Turkmenistan  
Afghanistan

## **6.5. Ownership and Management of Sites and Landscapes**

[This section will be available in the second draft, December 2016]

China  
Kyrgyzstan  
Tajikistan  
Kazakhstan  
Uzbekistan  
Turkmenistan  
Afghanistan

## **6.6. National Biodiversity Strategies and Action Plans**

[Further details in this section will be available in the second draft, December 2016]

The Convention on Biological Diversity (CBD) requires countries to prepare National Biodiversity Strategies and Action Plans (NBSAPs) as the principal instruments for implementing the Convention at the national level. According to the CBD, "The

requirement to integrate consideration of the conservation and sustainable use of biological resources into national decision-making, and mainstream issues across all sectors of the national economy and policy-making framework, are the complex challenges at the heart of the Convention.” This section provides an overview of the NBSAPs for the countries of the Mountains of Central Asia biodiversity hotspot and their participation in and implementation of multilateral environmental agreements and cross-border initiatives.

**Table \_\_. Membership in international conventions and conservation initiatives**

Country	CBD	CITES	Ramsar	CMS	CACILM	GSLEP	CAMI
China	X	X	X			X	X
Kyrgyzstan	X	X	X	X	X	X	X
Tajikistan	X	X	X	X	X	X	X
Kazakhstan	X	X	X	X	X	X	X
Uzbekistan	X	X	X	X	X	X	X
Turkmenistan	X		X		X	X	X
Afghanistan	X	X		X		X	X

Source: compilation of country information and convention websites (as of 15 NOV 2016)

### 6.6.1. China

China’s NBSAP lays out eight specific strategic tasks to achieve its goal of protecting its biodiversity:

1. Further improve related policies, regulations and systems on biodiversity conservation
2. Promote mainstreaming of biodiversity conservation into related planning processes
3. Strengthen capacities for biodiversity conservation
4. Strengthen in-situ conservation of biodiversity and rationally carry out ex-situ conservation
5. Promote sustainable development and use of biological resources
6. Improve benefit sharing of biological and genetic resources and associated traditional knowledge
7. Improve capacities to cope with new threats and challenges to biodiversity
8. Raise public awareness and strengthen international cooperation and exchange

### 6.6.2. Kyrgyzstan

In its NBSAP, Kyrgyzstan views the conservation and sustainable use of its biodiversity in terms of service to the sustainable socioeconomic development of the country. The NBSAP identifies four strategic targets:

1. Integrate biodiversity conservation issue into the activities of state bodies and public organizations by 2020, as the basis of the human being and sustainable economic development of the Kyrgyz Republic
2. Reduce the impact on biodiversity and promote its sustainable use
3. Improve the protection and monitoring of ecosystems and species diversity
4. Improve the social importance of biodiversity and ecosystem services, increase the benefits of sustainable ecosystem services and traditional technologies

The NBSAP elaborates on these targets with specific objectives and actions under each.



### **6.6.3. Tajikistan**

According to the NBSAP of Tajikistan, “The main goal of the strategy is to preserve and manage the biodiversity and to conserve ecosystems, thus providing the sustainable economic and social development of Tajikistan.”

The NBSAP lists the components of the biodiversity conservation strategy as:

- Complex economic and social evaluation of national biological resources
- Regeneration and conservation of the genetic pool of plants and animals
- Biodiversity conservation in-situ and ex-situ
- Providing biological safety of the country
- Sustainable use of biological resources to reduce poverty and to improve quality of human life

The strategy calls for the objectives “to take consecutive and purposeful actions according to the terms and volume of funding,” and draws attention to the legislative and institutional capacities. The main objectives are to:

- Develop the economic mechanism, promoting a conservation and sustainable management of the biological and landscape diversity
- Seek for funds inside and outside the country to provide the biodiversity conservation and its sustainable management
- Provide sustainable development and management of the country biodiversity at the level of ecosystems, species, intraspecific forms, and useful inherited forms
- Determine the needs of the country in the biodiversity use, basing on governmental priorities, with specific conditions of the country being considered
- Define technologies and methods of the biodiversity management and alternatives of its conservation on the part of governmental bodies, institutions, and organizations
- Determine and improve the role of the public in biodiversity conservation
- Make a contribution to implementation of the program on the poverty alleviation by 2005

### **6.6.4. Kazakhstan**

According to its NBSAP, Kazakhstan’s main National Strategy goals include the following:

- In-situ conservation of biological diversity
- Accounting for and socio-economic assessment of the country biological capacity and its balanced use in the legal framework
- Expanding the genetic fund, and providing genetic independence and biological security of the country
- Establishing conditions for conservation of the genetic fund of agricultural crop varieties, in particular, of agricultural animals and making agricultural land more productive

The National Strategy objectives include the following:

- Assessment of the status and specifics of biological diversity, as the eternal value and overall property of mankind
- Revealing and liquidating the danger for existence of species and ecosystems as a result of an anthropogenic impact

- Using the state sovereign rights for its resources, especially for their unique objects, and responsibility for their conservation
- Identification of the traditional dependence of local population on conservation and rational use of biological diversity including agrobiodiversity, for the purpose of satisfying the population needs in food, health, fuel-construction, raw material, business, technical, recreation, and other resources
- Identification of the optimum conditions for environmental rehabilitation and reducing greenhouse effects as a result of the increase of CO<sub>2</sub> (carbon emission) while biological diversity conservation
- Development of a legal framework for exception and conservation of bio-resources, establishing a balance of economic and social ecological benefits while non-exhaustive use of biological resources at the regional, national, and local levels
- Reduction of the dangers for and ensuring conservation of biological diversity
- Improvement of the coordination system for activities regarding the biological diversity issues
- Ecological reconstruction and rehabilitation of infringed ecosystems
- Providing for the local population and public non-governmental organizations awareness of the biological diversity conservation and balanced use issues

### **6.6.5. Uzbekistan**

According to Uzbekistan's Fifth National Report to the Convention on Biological Diversity, the country's first NBSAP set out five national strategic targets for biodiversity management:

1. Improvement of the system of the protected areas (Pas), including organization of ecologically sustainable and diverse Pas system, which covers at least 10 percent of the territory of Uzbekistan
2. Awareness of society, public participation and education to achieve adequate understanding and recognition of the importance of biodiversity for the sustainable development of Uzbekistan
3. Sustainable use of biodiversity resources to achieve the maximal meeting of economic, scientific, recreational and cultural demands of all people in Uzbekistan, providing simultaneous conservation of biological diversity and viability of ecosystems in the long-term perspective
4. Implementation of regional and local Action Plans on biodiversity in the context of the general framework of the Action Plan development; development of regional and the republican (in Karakalpakstan) Action Plans, which reflect more specifically regional and local demands and problems
5. Coordination of international relations and assistance in the sphere of biological diversity by way of the development of an organizational structure on professional and managerial issues compatible with international and regional legislation and agreements on biodiversity (CBD, the Ramsar Convention, the Bonn Convention, CITES, etc.)

The Fifth National Report goes on to say that, "Following the development and implementation of the First NBSAP, significant progress has been achieved in conservation and sustainable use of biological diversity in the Republic of Uzbekistan."

### **6.6.6. Turkmenistan**

The overall aim of Turkmenistan's NBSAP is "to conserve, restore and sustainably use the biological diversity of Turkmenistan for present and future generations." To reach this target, the strategy specifies the following objectives:

- To integrate biodiversity conservation activities into all levels of governmental programs
- To revise and develop nature protection laws in accordance with the Convention on Biological Diversity, eliminating gaps in the legislation
- To reduce the relative level of environmental pollution by 20 percent through the revision and improvement of nature protection laws
- To halt the process of degradation of natural landscapes in 30 percent of Turkmenistan's territory
- To preserve the existing state of the forests and restore 5 percent of their area
- To increase the level of public awareness on the importance of biodiversity to 50 percent and increase level of ecological education by 10 percent
- To increase protected areas by 6 percent and ensure their effective management
- To improve the conservation of agricultural biodiversity and ex situ conservation of genetic resources by 30 percent
- To develop and introduce economic incentives to increase local people's interest in biodiversity conservation
- To support internal and external funding of BSAP projects for the whole period of their implementation
- To increase investments for supporting the scientific potential of existing institutions relating to biodiversity conservation by 30 percent
- To develop a plan for biological resource management that aims to reduce overexploitation and ensure its implementation

#### **6.6.7. Afghanistan**

Afghanistan signed the Convention on Biological Diversity in 1992 and formally acceded to it in 2002. According to its NBSAP, Afghanistan aims at conserving all aspects of its biodiversity, and ensuring that future utilization of biodiversity resources is sustainable. The NBSAP includes the following elements:

- To continue ongoing assessments of Afghanistan's floral and faunal communities, with the overall aim of improving understanding of Afghanistan's biodiversity resources and their conservation requirements
- To expand the protected areas system to ensure that it is representative of all major ecosystems and areas of outstanding conservation or natural heritage value
- To develop and implement the support mechanisms (incentives, rules, regulations, environmental education, public awareness) necessary for the effective conservation of biodiversity and other natural resources
- To continue ongoing assessments of the status of Afghanistan's floral and faunal species, with the overall aim of improving understanding of Afghanistan's biodiversity resources and their conservation requirements
- To develop the mechanisms required for effective conservation of economically important species
- To develop and implement mechanisms to ensure sustainable use of biodiversity resources, including funding, capacity and policy considerations
- To prevent the illegal or unsustainable use of biodiversity resources
- To develop and implement mechanisms for preventing damage to natural ecosystems from invasive alien species
- To control impacts on biodiversity resources resulting from climate change, desertification and pollution
- To develop and implement mechanisms and plans for maintaining goods and services obtained from critical ecosystems, focusing on forests and woodlands
- To maintain cultural diversity by recognizing and valuing traditional knowledge and land uses
- To manage genetic resources for the benefit of all citizens of Afghanistan

- To ensure that government organizations have sufficient capacity and resources to carry out Afghanistan's obligations as a signatory to the CBD and other Multilateral Environmental Agreements

## **6.7. Links to the CEPF Monitoring Framework**

The past 25 years have been a period of dramatic changes and transition in the hotspot. Lack of resources available to environmental agencies and governance problems have had further impacts on biodiversity. To maximize the benefits of the legal and policy context, conservation investments may focus on:

- Encouraging greater collaboration and information exchange among different government agencies. Civil society groups, which often work with multiple agencies within a country, can act as a bridge between institutions.
- Supporting pilot programs to help develop new modalities for conservation that can then feed back into legal frameworks.
- Supporting best practice programs that demonstrate how the full application of the law can have multiple benefits.

## **7. CIVIL SOCIETY CONTEXT OF THE HOTSPOT**

CEPF believes that effective and sustainable conservation is better achieved with the engagement of civil society, and makes grants to civil society organizations, which then act as implementing agents. This chapter provides an examination of primary and potential civil society actors and their potential direct or indirect roles in conservation.

For the purposes of this chapter, CEPF defines civil society as all the national and international nongovernment actors that are relevant to the achievement of conservation outcomes and strategic directions. This includes, at least, local and international conservation NGOs; economic and community development NGOs; scientific, research and academic institutions; professional organizations; producer and sales associations; religious organizations; media; advocacy groups; outreach, education and awareness groups; formal and informal schools; social welfare agencies; indigenous groups and indigenous rights groups; land reform groups; and the parts of the private sector concerned with the sustainable use of natural resources.

### **7.1. China**

[This section will be available in draft 2, December 2016]

#### **7.1.1. Conservation and development organizations**

#### **7.1.2. CSO networks**

#### **7.1.3. Capacity**

#### **7.1.4. Operating environment and constraints**

Working in the harsh natural environment with difficult access in an underdeveloped region is challenging. The Pamir Mountains in China reach 5,000 meters, and weather conditions can be hazardous. Difficult terrain may also be an obstacle in implementing projects there.

Local authorities may not have much influence with the local population in terms of hunting or gathering herbs, and there are some areas where residents do not allow strangers to go. The level of education and the economic status of the residents is poor.

#### **7.1.5. Gaps**

China's iconic Giant Panda receives both attention and funding beyond what other species get. Funding for the conservation and restoration of populations and habitats is considered sufficient for the snow leopard, Xinjiang salamander, Przewalski's horse, swans and wild apples and walnuts. In contrast, the Tien Shan birch, *Ammopiptanthus* and other threatened species receive less attention and support.

## **7.2. Kyrgyzstan**

[This section will be available in the second draft, December 2016]

### **7.2.1. Conservation and development organizations**

The largest nature use organization is the Kyrgyz Association of Forest and Land Users with offices in all country provinces and almost 7,000 members. The Alliance of Central Asian Mountain Communities (AGOCA) unites 57 villages from Kyrgyzstan,

Tajikistan, and Kazakhstan. AGOCA activities are aimed at increasing the capacity of rural communities through educational seminars and practical training, as well as through support for the exchange of experience and knowledge and the mobilization of local communities to solve local problems.

The main focus of the Global and Local Information Partnership (GLIP), based in Bishkek, is on conserving high mountain biodiversity, in particular, the conservation of snow leopard habitat and prey species.

Other Kyrgyz CSOs carry out studies of mammals, birds and forests, or work with farmers, breeders and pasture associations.

The staff of the National Academy of Sciences have given scientific advice related to the conservation of biodiversity to the State Agency on Environment Protection and Forestry to establish several new protected areas and nature reserves such as Khan Tengri, Dashman, Besh-Aral, Sarychat-Ertash, Sarkent and others.

Several CSOs work on traditional knowledge, the rights of citizens to a healthy environment, environmental safety of local communities and transparency. Some CSOs resist governmental initiatives that entail improper use of protected areas and forest lands, or that allow the hunting of endangered animals and assists the prosecutors in bringing cases involving the misuse of natural resources.

Other CSOs conduct public hearings, participate in the reintroduction of animals and work on strengthening the role of society in the protection of flora and fauna, and educate the local population in the spirit of hunting ethics and respect for nature. Recent accomplishments include reducing the incidence of illegal hunting and logging, and demonstrating how tourism can make a significant contribution to sustainable community development.

Some CSOs are planning to establish micro reserves and small plantations of native species of fast-growing trees for fuel, construction or reducing risk of soil erosion.

The Mountain Partnership Central Asia Hub hosted by University of Central Asia is an established core group of mountain advocates committed to sustainable mountain development, and includes 40 organizations from 8 countries of greater Central Asia. The Mountain Partnership is innovative, and conducts outreach, networking and capacity building, and offers tools and platforms for use by regional stakeholders. It provides technical support to member countries and their governments for the mainstreaming of the mountain agenda into policy and planning processes.

### **7.2.3. Capacity**

The development of new technologies and specific activities related to conservation calls for the participation of highly qualified specialists, and despite the relatively high level of education and training in the country, NGOs question the availability of enough highly qualified specialists to carry out the work.

### **7.2.4. Operating environment and constraints**

Some Kyrgyz NGOs report that obtaining grants has become difficult. Access to GEF funds is not easy, and the requirement for substantial matching funds on the part of local

organizations puts funding beyond their reach. The non-profit sector blames the decline in the availability of funding on the lack of transparency and accountability, and on mismanagement. Other constraints include the failure to notify CSOs about grant competitions, the complexity of application and reporting procedures, and language requirements.

NGOs report successful experiences in working with small grants from the GEF SGP, the European Union and the World Bank. The Alliance of Central Asian Mountain Communities is able to obtain grants with no difficulties.

Potential barriers to successful implementation of the projects include the inaccessibility of certain areas, bureaucratic red tape and restricted access to information. Finally, CSOs warn against ignoring the views and visions of local communities and local authorities.

#### **7.2.5. Gaps**

### **7.3. Tajikistan**

[This section will be available in the second draft, December 2016]

#### **7.3.1. Conservation and development organizations**

The Tajik Socio-Ecological Union is one of the oldest CSOs that helped create the Tajik National Park and Shirkent Natural Park. Other CSOs help to develop management plans for protected areas, and work to increase public awareness and the level of knowledge about the importance of biodiversity among the local population. Many CSOs help in improving the quality of life for rural residents while reducing negative pressure on natural resources through the introduction of resource-saving technologies and clean energy sources.

Some CSOs work on information sharing, round tables and campaigns to involve people in environmental protection. There is a great interest in dialogue and cooperation with Afghanistan on joint solutions to common ecological problems. Several CSOs work on restoration of biodiversity by planting native tree species, developing alternative sources of income for communities near protected areas, promoting organic agriculture, and biological methods of crops protection.

#### **7.3.2. CSO networks**

#### **7.3.3. Capacity**

#### **7.3.4. Operating environment and constraints**

Tajik CSOs assert that the number of donors providing grants for conservation by civil society has dropped dramatically, and that fundraising for environmental projects has become more difficult in spite of persistent threats to the biodiversity. Funding sources impose requirements that are too high. Grant information is not always available to NGOs.

One of the difficulties is the requirement for substantial co-financing. Funding agencies do not conduct outreach with CSOs on their requirements.

Project implementation in the mountain regions faces seasonal restrictions associated with road closures caused due to bad weather. The remoteness of villages is one of the major problems, and the lack of communication and electricity in rural areas complicates the project work. Transport and fuel costs are high.

In the harsh mountain conditions, the monitoring of animals and plants can be challenging. The border areas have certain restrictions and special regulations for access; in addition the longest border zone with Afghanistan is still considered insecure.

Language barriers can be significant. Most information prepared in Russian and English needs to be translated to Tajik, and the variety of local dialects may complicate outreach work in the field. Translations and interpretation services take time and can be expensive.

Tajik CSOs claim that without the equal and active participation of women in decision-making and in the development of their villages and jamoats, projects will not be able to achieve significant results. They point out that women can and should be leaders and change their communities for the better, but that for various reasons (tradition and religion) attracting women to participate in projects and in public life on an ongoing basis is very difficult.

The weak capacity and motivation of the local authorities and populations, together with the economic problems in remote areas may diminish enthusiasm for some projects, especially when the public and the government agencies have a lack of understanding concerning the project activities. Some local authorities (usually the district level) may respond with hostility if local problems or data on the hard life of the local communities hits the press or is voiced at conferences.

### **7.3.5. Gaps**

## **7.4. Kazakhstan**

[This section will be available in the second draft, December 2016]

### **7.4.1. Conservation and development organizations**

Kazakh CSOs are diverse in their thematic niche, scale and geographic focus. Science-oriented CSOs conduct research to assess biodiversity conditions and to develop plans for improving biodiversity and soils. Associations of hunters conduct surveys of wildlife. One of the largest conservation groups – the Kazakh Association of Biodiversity Conservation (ACBK) conducted mapping of Important Bird Areas, helped to create several nature reserves and contributed to biodiversity monitoring, legislation revisions, public awareness campaigns and a cross-border effort to nominate the Western Tien Shan as a UNESCO World Heritage Site.

In 2008, the ecological society “Green Salvation” launched a campaign against a project to construct a high-voltage power line through two national parks. As a result of the public campaign, the project was changed, and in 2013 a new project built high-voltage lines that bypass the parks.



Other CSOs lobbied for the expansion of nature reserves, and improved their technical equipment and monitoring methods. Some CSOs work on the rights of access to environmental information and the development of recommendations for the authorities on the reduction of industrial pollution in eastern Kazakhstan.

#### **7.4.2. CSO networks**

#### **7.4.3. Capacity**

#### **7.4.4. Operating environment and constraints**

Among the potential problems for international funders working in Kazakhstan are certain gaps and contradictions in the legislation regulating the work of CSOs. Established in 2016, the Ministry of Culture and Sport is responsible for the supervision and control of non-profit organizations.

Kazakh NGOs report good experience with the GEF SGP, the European Union and the World Bank.

Potential barriers include a lack of knowledge and a conflict of interest with hunting groups. The local authorities can be arbitrary.

Implementation of cross-border projects can be difficult. One possible approach to cross-border projects is to have each country carry out its part independently. The most difficulty of the work in the high mountain zones is attributable to bad weather and the lack of infrastructure.

Working with the local population can also be a difficult part of a project. Most of the rural population is engaged in traditional animal husbandry with little regard for pasture rotation. Since this is their main income-generating activity, they do not think about the conservation of biodiversity and ecosystems, and convincing them to consider these issues can be quite difficult.

#### **7.4.5. Gaps**

The snow leopard and the argali attract both state and international grant funding for the monitoring of habitats and related activities. Wild apples also receive significant attention. Still, according to local experts, funding levels are not sufficient to save them in the long run.

The protection of the saiga antelope receives most of Kazakhstan's attention to endangered or threatened species.

### **7.5. Uzbekistan**

[This section will be available in the second draft, December 2016]

#### **7.5.1. Conservation and development organizations**

Uzbek CSOs work on combating desertification; the protection and monitoring of wildlife; the conservation of natural and cultural heritage; alternative energy; water, sanitation, and the protection of water resources; and gender issues. Many CSOs specialize in environmental education and awareness activities. Some CSOs focus on

specific taxa, such as the Society for the Protection of the Birds. Mahalla associations work on the protection of the local environment and on environmental education.

#### **7.5.2. CSO networks**

#### **7.5.3. Capacity**

#### **7.5.4. Operating environment and constraints**

Grants from abroad can be obtained by local CSOs only by passing a Central Bank Commission examination, a hurdle that is difficult to clear. To apply for a grant from abroad, an organization must obtain permission from the Ministry of Justice.

Challenges to the conservation work in the country include the need for permits and admission to the mountain ecosystems located in the border areas and the lack of knowledge and training.

#### **7.5.5. Gaps**

The species that draw the most attention and funding are the snow leopard and the Bukhara deer – both of which are popular with international projects.

### **7.6. Turkmenistan**

[This section will be available in the second draft, December 2016]

#### **7.6.1. Conservation and development organizations**

The Turkmen Society of Nature Protection is the oldest and largest nature conservation group in the country. Its activities cover: combating desertification; environmental education; the protection of wildlife; the protection of forests and sustainable forest management; conservation of natural and cultural heritage; the environment and health of children; alternative energy; water, sanitation and the protection of water resources. The Turkmen Society of Hunters and Fishermen is another large organization that works for the protection of wildlife and rational use of animals, birds and fish. Other CSOs are active in commenting on legislation on protected areas, flora, fauna, environmental impact assessments, pastures, and forests.

#### **7.6.2. CSO networks**

#### **7.6.3. Capacity**

#### **7.6.4. Operating environment and constraints**

Foreign partners of local CSOs must conduct consultations with authorities, and register project applications in advance. Project implementation in the potential project site of Turkmenistan is not considered to be difficult. Obtaining permits for access to the nature reserves may be a long process.

#### **7.6.5. Gaps**

### **7.7. Afghanistan**

[This section will be available in the second draft, December 2016]

**7.7.1. Conservation and development organizations**

**7.7.2. CSO networks**

**7.7.3. Capacity**

**7.7.4. Operating environment**

**7.7.5. Gaps**

**7.8. Links to the CEPF Monitoring Framework**

## 8. THREATS TO BIODIVERSITY IN THE HOTSPOT

[This section will be further updated in the second draft, December 2016]

The mountains of Central Asia have long been exploited for grazing, food, timber, and fuel. The human population of the hotspot numbers around 42-44 million people in Central Asia's part and about 17-20 million in the Chinese part, with more people living in the adjoining plains.

Population density across the hotspot varies greatly: in the Ferghana Valley it is around 400 per square kilometer, but fewer than 2-4 people per square kilometer live in the Tajik Pamir (est. 200,000) and the Afghan Wakhan (est. 15,000). A steady rise in the human population and domestic livestock, and the associated need for land and resources, have increased pressure on the environment, which has reached unsustainable levels in many places. Political and economic changes in the five countries of the former Soviet Union in Central Asia, particularly the transition to a market economy and withdrawal or reduction of government subsidies and support created difficult economic situations for many mountain dwellers. This led to intensified use of natural resources to meet peoples' needs. Habitat degradation, overgrazing, and unregulated hunting of animals and collection of plants emerged as the three major and continuing threats.

Afghanistan has experienced decades-long civil war and many country areas still display insecurity. The impacts of conflict in Afghanistan were devastating for the people, economy and the environment. While most of northern and western forests of the country are not in the hotspot, they are among of the most depleted natural resources because of conflict and related causes. Northern areas of the country, on the border with Central Asia states, which for many years were considered as relatively safe, are now on the list of security hotspots. The Wakhan Valley is one of the exceptions, where civil conflict and insecurity did not directly affect the people and nature, but its remoteness, poverty and low level of development contribute to the elevated threat levels to biodiversity. On the other side of the border and mountains – in Western China – skyrocketing development led to the intense use of resources.

It is estimated that no more than 20 percent of the original vegetation of the hotspot remains in an intact state (reference).

### 8.1. Direct Drivers

The Millennium Ecosystem Assessment and national biodiversity assessments and strategies identify the following direct drivers of change in biodiversity and ecosystems:

- Habitat change
- Climate change
- Invasive alien species
- Overexploitation of species and ecosystems
- Pollution

The boundaries between these direct drivers can be indistinct: climate change, for example, can create conditions attractive to invasive species, and invasive species can lead to changes in habitat, but the Convention on Biological Diversity and its Parties follow this organizational scheme and this chapter does as well. Subcategories under the direct drivers identify more specific threats.

### 8.1.1. Habitat Change

The Convention on Biological Diversity notes that habitat change has been the most important driver of terrestrial ecosystem changes over the past 50 years (CBD 2006). Changes in land use, the modification of natural river flows and the withdrawal of water from rivers are common examples of habitat change.

In the mountains of Central Asia hotspot, most of the land in the lowland semi-deserts and foothills has been converted to agricultural use, mainly for cultivation of cotton, cereals and other crops. The agricultural conversion has resulted in the loss of grasslands and semi-deserts and has diminished soil fertility. Poor water management and irrigation practices, together with pollution from the overuse of fertilizers and pesticides have further degraded soil productivity (USAID 2013).

Rapid development in northwest China led to the reduction in forest cover and change in land use in several mountain areas and oases (reference).

Damming for hydropower and installing massive irrigation schemes of low efficiency have disrupted river flows and affected lands and soil conditions, while excessive water withdrawals in the agriculture sector led to the Aral Sea disappearance, major river water ecosystem changes and species extinctions.

[Samples]

### 8.1.2. Climate Change

The long-term effects of global warming pose a threat to the biodiversity of the mountains of Central Asia both directly as an independent cause of disruption and change and indirectly in synergy with other threats. According to the Millennium Ecosystem Assessment, “Observed recent changes in climate, especially warmer regional temperatures, have already had significant impacts on biodiversity and ecosystems, including causing changes in species distributions, population sizes, the timing of reproduction or migration events, and an increase in the frequency of pest and disease outbreaks.” The Assessment also finds that the impacts on biodiversity of climate change are increasing at a very rapid rate, and that climate change is likely to be one of the most significant drivers of biodiversity loss by the end of the century. The Assessment’s projections for the effects of climate change on biodiversity pose serious challenges globally and echo in the Central Asia Mountains:

Climate change is projected to further adversely affect key development challenges, including...conserving ecological systems and their biodiversity and associated ecological goods and services:

- Projected changes in climate during the twenty-first century are very likely to be without precedent during at least the past 10,000 years and, combined with land use change and the spread of exotic or alien species, are likely to limit both the capability of species to migrate and the ability of species to persist in fragmented habitats.
- Climate change is projected to exacerbate the loss of biodiversity and increase the risk of extinction for many species, especially those already at risk due to factors such as low population numbers, restricted or patchy habitats, and limited climatic ranges.
- Water availability and quality are projected to decrease in many arid and semiarid regions [such as Central Asia].

- The risk of floods and droughts is projected to increase.
- The incidence of vector-borne and of waterborne diseases is projected to increase.

[Samples]

Chapter 9 provides a more thorough discussion of specific climate change impacts in the hotspot.

### **8.1.3. Invasive Alien Species**

CBD summarizes the potential role of invasive species as follows:

Invasive alien species can transform the structure and species composition of ecosystems by repressing or excluding native species. Because invasive species are often one of a whole suite of factors affecting particular sites or ecosystems, it is not always easy to determine the proportion of the impact that can be attributed to them. In the recent past, the rate and risk associated with alien species introductions have increased significantly as a result of increased travel, trade and tourism (CBD 2013).

[Samples]

### **8.1.4. Overexploitation of Species and Ecosystems**

#### **Poaching and illegal hunting**

Poaching, especially of larger mammals and birds, is an issue in the region. High-value mountain ungulates are killed or captured for profit. Falcons are exported to the Middle East, where they fetch a high price when sold to falconers.

[Samples]

#### **Collection of Plants**

Unregulated collection of plants poses a direct threat to globally threatened and restricted-range species and impoverishes the diversity of ecosystems. Villagers pick endemic species of tulips to sell, and some species have become very rare in several areas as a result. Collection of plants for medicinal use (of which there are around 200-300 species in the hotspot) is controlled to a limited extent.

Energy shortages in the mountain areas led to the cutting of trees and shrubs for fuel. This, together with overgrazing inside the mountain forests, has disrupted the natural processes in unique and valuable mountain ecosystems of Central Asia – juniper and walnut-fruit forests. The quality of these forests diminished and regeneration slowed.

[Samples]

#### **Overgrazing**

After the fall of the Soviet Union during the 1990s, the number of domestic livestock in the mountains of Central Asia initially declined, alleviating pressure on ecosystems, but with stabilization of the economy and growth in income and population throughout the region, the number of sheep and goats has increased sharply, and overgrazing affects many areas, especially the foothills and lower slopes (800-2,000 meters), and to much lesser extent the high altitudes of 2,500-3,500 meters. Severe degradation is observed around settlements, but a wider area is affected in less visible ways. Overgrazing steadily reduces the fresh grass yield and causes changes in species composition, with

increasing predominance of less palatable species. This reduces the productivity of alpine meadows and the number of wild herbivores they can support, and increases the risk of soil erosion. In parts of the Chinese Tien Shan, livestock numbers multiplied in the last 50 years, and serious overgrazing and pasture degradation began as early as the 1970s (Zhang 2002).

[Samples]

#### **8.1.5. Pollution**

The pollution threats to the biodiversity hotspot come from several sources – current and past applications of agricultural chemicals, the storage of obsolete and discarded chemicals, mercury, lead and phosphorous contamination, industrial discharges and hazardous waste, and mine tailings including radioactive tailings from uranium mining. Within the mountains of Central Asia hotspot, the Lake Issyk-Kul region and the Ferghana Valley are notably vulnerable to the threats posed by pollution.

[Samples]

### **8.2. Indirect Drivers (Root Causes)**

In addition to the direct drivers, the Millennium Ecosystem Assessment identifies five types of indirect drivers:

- Demographic
- Economic
- Sociopolitical
- Cultural
- Scientific and technological
- Weak governance, institutions and enforcement

The subcategories under each indirect driver identify the specific causes that require attention – weak regulatory schemes and poor enforcement, for example. But the general categories are helpful in understanding root causes: the motivation for poaching, for example, may come from underlying economic conditions. The improvement of regulations and enforcement might reduce illegal hunting, but this intervention is unrelated to the economic conditions that may explain why poaching occurs.

#### **8.2.1. Demographic Pressures**

The strongest demographic pressure on biodiversity comes from population growth – more people require more resources – but the demographic dynamics are also factors, and this section covers migration and the changes in urban and rural population distributions in addition to population growth.

[Samples]

#### **8.2.2. Economic Factors**

Expansion of settlements, construction of roads and other infrastructure, recreational facilities, mining, and other economic activities may destroy and fragment natural habitats. Much of the hotspot remained accessible only by foot or on horseback until the mid-twentieth century, but roads, if not highways, have opened up wide tracts of the

mountains, and facilitated exploitation and increasing disturbance.

The recreational load on mountain ecosystems is growing as increasing numbers of local and overseas tourists visit the region and impact on the environment through their various activities. Accommodation facilities, access roads, and infrastructure for skiing and other mass tourism further encroach on habitats and add to the disturbance.

[Samples]

### **8.2.3. Sociopolitical Factors**

#### **8.2.3.1. Insecurity and border challenges**

Civil unrest in Tajikistan in the early 1990s and decades of war in Afghanistan posed a direct threat to the population and wildlife. Spread of guns in Afghanistan ... Increased borders and fragmentation ... Role of border guards as poachers ... Many nature reserves are along borders – complicated access and work requiring permissions ...

#### **8.2.3.2. Weak regulations and enforcement**

Weak regulatory schemes and poor enforcement contribute to the overexploitation of natural resources throughout the region. In some cases, hunting permits are granted in contradiction to existing protection laws due to confusing or unclear regulations.

[Samples]

### **8.2.4. Cultural Factors**

The Millennium Ecosystem Assessment states that, “Culture conditions individuals’ perceptions of the world, and by influencing what they consider important, it has implications for conservation and consumer preferences and suggests courses of action that are appropriate and inappropriate.”

[Samples: knowledge and literature Ch. Aitmatov, awareness and literacy levels]

### **8.2.5. Scientific and Technological Factors**

The Millennium Ecosystem Assessment identifies science and technology as indirect drivers of impacts on ecosystems, and points out that, “The development and diffusion of scientific knowledge and technologies can on the one hand allow for increased efficiency in resource use and on the other hand can provide the means to increase exploitation of resources.”

[Samples: GPS tracking, remote cameras, mining at high elevations]

### **8.2.5. Weak institutions, regulations and enforcement**

[Samples]

## **8.3. Summary of Threats by Country**

In their National Biodiversity Strategies and Action Plans (NBSAPs), National Reports to the Convention on Biological Diversity and during CEPF consultations, the hotspot countries identified biodiversity threats, which are summarized in this section.



### 8.3.1. China

[More hotspot specific information will be available in Draft 2, December 2016]

Almost half of the Central Asia Mountains biodiversity hotspot extends into the Chinese province of Xinjiang and takes in the eastern parts of the Tien Shan and Pamir mountain ranges. The area supports numerous globally threatened, endemic and relict species (WHC 2013). In general, China identifies its main pressures on biodiversity as deriving from the population pressures and the accelerating pace of industrialization and urbanization (Fifth National Report 2014). Other indirect drivers include inadequate legal protections, lack of enforcement and overlapping authorities (NBSAP 1994). China's biodiversity reports also mention the full range of direct drivers – habitat loss, climate change, invasive species, overexploitation and pollution (Fifth National Report 2014 and NBSAP 1994). Within the hotspot, however, the threats are considered moderate and coming mainly from booming extractive industries, infrastructure development, increasing consumption and cultural changes (WHC 2013). Invasive species is not an issue, but some areas have experienced damage from forest pests. Rapidly growing domestic tourism potentially threatens the habitats and species, including those under protection, especially nearby the large urban centers. Other threats include hunting, climate change impacts and shrinking glaciers (WHC 2013; World Heritage 2012).

**Table \_\_. Direct drivers in Chinese Tien Shan**

Direct driver	Country- or area-specific driver
Habitat change	Agricultural encroachment Infrastructure development Tourism development
Climate change	Shrinking glaciers and impacts on the nival-glacier ecosystems Shifts in biological functionality and ecosystem range, and species occurrence Worsening of dust storms and desertification
Invasive alien species	Not reported
Overexploitation of species and ecosystems	Unregulated hunting Overgrazing of pastures Damage to forests, plants collection
Pollution	Intensive use of chemicals in agriculture Industrial emissions and discharges Growth in vehicles number, noise, emissions Improper waste management

Sources: NBSAP 1994; Fifth National Report 2014; WHC 2013; and World Heritage 2012

**Table \_\_. Indirect drivers in Chinese Tien Shan**

Indirect driver	Country- or area-specific driver
Demographic	Population growth and domestic migration
Economic	Rapid industrialization Mass tourism Consumption
Sociopolitical	Inadequate management and staffing
Cultural	Traditional skills and the modern era
Scientific and technological	
Institutions, regulations and enforcement	

Sources: NBSAP 1994; Fifth National Report 2014; WHC 2013; and World Heritage 2012

### 8.3.2. Kyrgyzstan

[More hotspot specific information will be available in Draft 2, December 2016]

Almost the entire country area falls within the hotspot. Foothill steppes and semi-desert steppes near settlements are among the most affected ecosystems, and the wild fruit and nut forests are under growing pressure. Over the last 50 years, fir and juniper forests have declined by one third, while fruit and nut forests have declined by half (Kyrgyz NBSAP 1998). Fish stocks in the iconic Issyk-Kul Lake have experienced collapse and the lake ecosystem is affected by numerous pressures – from invasive species and overfishing to pollutants and untreated runoff discharges, plastic litter on the lakeshore and climate change impacts. Kyrgyzstan identifies forests and pastures as the ecosystems with the greatest economic and social importance to the country (Fifth National Report 2013), and specifies the destruction of natural ecosystems due to increases in land use intensity and human encroachment as a key threat to biodiversity (Kyrgyz NBSAP 1998).

**Table \_\_. Direct drivers in Kyrgyzstan**

Direct driver	Country-specific driver
Habitat change	Agriculture encroachment Artisanal gold mining and destruction of riverbeds Industrial mining and geological exploration Lack of pasture rotation
Climate change	Likely altitudinal shifts in ecosystems and species distribution Long-term risk from mining at high elevations (waste stability)
Invasive alien species	Introduced fish species in the Issyk-Kul Lake Grey rat, myna, squirrel
Overexploitation of species and ecosystems	Over-collection of some plant species Overfishing in the Issyk-Kul Lake Overgrazing of pastures Illegal / unregulated hunting and poaching
Pollution	Damage to flora and fauna in agricultural areas (chemicals) Contamination and impacts from mining activities and industries

Sources: Kyrgyz NBSAP 1998; Fifth National Report 2013

**Table \_\_. Indirect drivers in Kyrgyzstan**

Indirect driver	Country-specific driver
Demographic	Population in and around urban areas (unregulated migration) Ethnic clashes in the Ferghana Valley
Economic	Energy shortages Poverty and lack of income sources
Sociopolitical	Lack of funds for conservation Underdeveloped institutional capacity
Cultural	Limited public awareness despite traditional values placed on natural resources
Scientific and technological	Strong science base from the previous investments (Soviet era) Limited research capacities and human potential
Institutions, regulations and enforcement	Limited or ineffective grazing regulations in mountain forests Weak government capacities to manage protected areas

Sources: Kyrgyz NBSAP 1998; Fifth National Report 2013

### 8.3.3. Tajikistan

[More hotspot specific information will be available in Draft 2, December 2016]

The entire country of Tajikistan is in the hotspot with ecosystems ranging from lowland and high mountain deserts to grasslands, forests, and glaciers. The monitoring of species, forest resources, and ecosystems has not kept pace with modern developments, academic programs are declining, and reliable data on the state of biodiversity is lacking. The capacities of the state for conservation and maintenance of the nature reserves are constrained and under-budgeted, and CSOs are supporting the functions of environmental protection and education. Rapid population growth and a dearth of economic opportunities have placed significant pressures on biological resources, particularly on forests and pastures. Disturbance of forests and conversion of many foothill lands and natural pastures to agriculture are transforming the compositions of ecosystems that are home to valuable genetic resources, and are threatening the existence of species and ecosystems near densely populated areas, such as around Tigrovaya Balka reserve, in spite of additional efforts to add a buffer zone to this reserve and improve the water supply for its wetlands. One of the protected areas – Saryhosor in Central Tajikistan – has shrunk due agricultural encroachment. The lack of proper controls and the absence of land titles lead to the illegal or unsustainable collection of forest products and to further deforestation, as most people depend on biological resources for food, income and welfare (Fifth National Report 2014).

**Table \_\_. Direct drivers in Tajikistan**

Direct driver	Country-specific driver
Habitat change	Agricultural encroachment Unclear land use rights and regulations Expansion of infrastructure Tourism
Climate change	Shrinking glaciers and impacts on the nival-glacier ecosystems Likely altitudinal shifts in ecosystems and species distribution
Invasive alien species	Increase in non-native tree species due to unregulated afforestation and reforestation Grey rat, myna, squirrel
Overexploitation of species and ecosystems	Illegal forest cutting and plants collection Illegal and unregulated hunting Overgrazing of pastures and forests
Pollution	Mining

Sources: Tajik NBSAP 2003; Fifth National Report 2014

**Table \_\_. Indirect drivers in Tajikistan**

Indirect driver	Country-specific driver
Demographic	High rates of population growth Too ridged terrain for re-distribution of population
Economic	Poverty and food insecurity Lack of energy High dependency on biological resources
Sociopolitical	Absence of pasture management systems Failure to value biodiversity Incomplete land reforms
Cultural	Low levels of environmental education Consumption attitude toward biological resources
Scientific and technological	Lack of natural resources planning and management Limited research capacities and human resources
Institutions, regulations and enforcement	Weak implementation of laws and regulations Contradictory or duplicative functions of authorities

Sources: Tajik NBSAP 2003; Fifth National Report 2014

### 8.3.4. Kazakhstan

[More hotspot specific information will be available in Draft 2, December 2016]

Karatau ridge is home to the greatest number of endemic species in Central Asia, and provides habitats for globally threatened species and isolated sub-species of plants, animals and birds of prey. Foothills support rain-fed crop production and free-range animal husbandry; both sectors are expanding. Tien Shan's natural beauty attracts tourists, and some mountain ecosystems are suffering from recreational pressures, especially near Almaty where hikers and skiers visit in large numbers. Unregulated grazing, illegal hunting and the collection of medicinal plants, endemic tulips and wild fruits and berries are challenges to biodiversity. (Fifth National Report 2014).

**Table \_\_. Direct drivers in Kazakhstan's southeastern mountains**

Direct driver	Country- or area-specific driver
Habitat change	Forest fires, pests and diseases Recreation Infrastructure development
Climate change	Impacts on mountain forests Threats to survival of genetic resources
Invasive alien species	Grey rat, myna, squirrel
Overexploitation of species and ecosystems	Overgrazing Illegal hunting Collection of rare insects and plants
Pollution	Increase in vehicles, noise and pollution

Sources: Kazakh NBSAP 1999; Fifth National Report 2014

**Table \_\_. Indirect drivers in Kazakhstan's south-eastern mountains**

Indirect driver	Country- or area-specific driver
Demographic	
Economic	
Sociopolitical	Ineffective regulation of hunting
Cultural	
Scientific and technological	
Institutions, regulations and enforcement	

Sources: Kazakh NBSAP 1999; Fifth National Report 2014

### 8.3.5. Uzbekistan

[More hotspot specific information will be available in Draft 2, December 2016]

Southeastern Uzbekistan within the Mountains of Central Asia hotspot includes its most populated parts – Tashkent city agglomeration (5 million) and the Ferghana Valley (9 million). Several water reservoirs serve as nesting areas and wintering grounds for birds, and are considered as both IBAs and KBAs. Uzbekistan considers the main threats to the mountain biodiversity in the country to be the loss of habitats; decreases in population sizes and losses of species due to overexploitation; losses of genetic diversity and climate change impacts (Fifth National Report 2015). The agricultural sector has converted many natural areas in the foothills to farmland, has introduced pesticides into the environment, has expanded irrigation to new areas and has allowed livestock to overgraze pastures. Other economic activities that affect the state of biodiversity include the construction of roads, pipelines and other linear infrastructure that may become a barrier for animal migration, and unregulated tourism.

**Table \_\_. Direct drivers in south-eastern Uzbekistan**

Direct driver	Country-specific driver
Habitat change	Agricultural encroachment Recreation
Climate change	Impacts on freshwater ecosystems (droughts, poor water quality) Impacts on mountains forests
Invasive alien species	Grey rat, myna, squirrel
Overexploitation of species and ecosystems	Illegal hunting Over-collection of plants
Pollution	Agricultural chemicals Mining and industrial waste

Sources: Uzbek Fifth National Report 2015

**Table \_\_. Indirect drivers in south-eastern Uzbekistan**

Indirect driver	Country-specific driver
Demographic	Population growth
Economic	Agricultural expansion
Sociopolitical	
Cultural	
Scientific and technological	
Institutions, regulations and enforcement	

Sources: Uzbek Fifth National Report 2015;

### 8.3.6. Turkmenistan

[More hotspot specific information will be available in Draft 2, December 2016]

The Koytendag Ridge, a spur of the Pamir and Hissar Mountains, juts into the southeast corner of Turkmenistan, and is the country's only territory within the Mountains of Central Asia hotspot (ca 350,000 ha) and it includes the tallest mountain of the country – Airbaba (3,139 meters). Semi-desert, grassland, forest and underground ecosystems in the area provide habitats for rare, endemic and endangered plants and animals. The area is home to 130 species of medicinal plants and 40 wild crop relatives. The expansion of agriculture and the pressures brought by recreation together with the effects of overexploitation of species are among the threats in the Koitendag Range.

**Table \_\_. Direct drivers in Turkmenistan's Koytendag Mountains**

Direct driver	Country- or area-specific driver
Habitat change	Agricultural expansion Recreation
Climate change	Aridisation and deserts expansion
Invasive alien species	Introduced fish species
Overexploitation of species and ecosystems	Overgrazing Illegal hunting Unregulated plant collection
Pollution	Mining legacies

Sources: Turkmenistan NBSAP 2002; Fourth National Report 2009

**Table \_\_. Indirect drivers in Turkmenistan's Koitendag Mountains**

Indirect driver	Country-specific driver
Demographic	
Economic	
Sociopolitical	

Cultural	
Scientific and technological	
Institutions, regulations and enforcement	

Sources: Turkmenistan NBSAP 2002; Fourth National Report 2009

### 8.3.7. Afghanistan

[More hotspot specific information will be available in Draft 2, December 2016]

For the country as a whole, Afghanistan lists the main threats to its biodiversity as land conversions for agriculture and housing, illegal hunting, deforestation, overgrazing, shrub collection, dryland farming, water diversion, and climate change (Fifth National Report 2014). The underlying issues are population growth of 4 per cent per year (including migration), a low level of development, and widespread poverty (NBSAP 2014; Fifth National Report 2014). While the government recognizes the consequences of biodiversity loss, the pressures for survival at the local level and economic growth at the national level have resulted in little action (NSCA and NAPA 2009).

The Afghan territory that lies within the Central Asia mountain biodiversity hotspot is the entire Wakhan Valley, which was declared a national park in 2014. Located in the most remote and highest mountains of the hotspot, the Wakhan Valley hosts globally important biodiversity. Its diverse mountain fauna include Marco Polo sheep, ibexes, brown bears, yaks and snow leopards (NBSAP 2014). The Panj River, which forms the natural and political border between Afghanistan and Tajikistan and the adjoining mountains form part of the hotspot too. Remarkably, after 25 years of war and instability, the Wakhan Valley appears to be largely intact (NBSAP 2014). The main threats within the Afghan part of hotspot are overgrazing and the trampling of pastures by livestock, and the poaching of wild sheep for meat. The free movement of Marco Polo sheep and snow leopard across the international borders of the Wakhan Valley has inspired discussions of a transboundary protected area including parts of Afghanistan, Tajikistan, China and Pakistan (NSCA and NAPA 2009). The Afghan-Tajik border at the time of the report writing was characterized by insecurity and high risk for project interventions. In addition, very limited information is available for the Afghan side, so this area is not described in detail.

**Table \_\_. Direct drivers in Afghanistan (Wakhan Valley)**

Direct driver	Country-specific driver
Habitat change	Degradation of pastures
Climate change	Shrinking glaciers and impacts on the nival-glacier ecosystems
Invasive alien species	-
Overexploitation of species and ecosystems	Overgrazing Illegal hunting
Pollution	-

Sources: Afghan NBSAP 2014; Fifth National Report 2014; and NSCA and NAPA 2009

**Table \_\_. Indirect drivers in Afghanistan (Wakhan Valley)**

Indirect driver	Country- or area-specific driver
Demographic	Population growth
Economic	Widespread poverty
Sociopolitical	

Cultural	
Scientific and technological	
Institutions, regulations and enforcement	

Sources: Afghan NBSAP 2014; Fifth National Report 2014; NSCA and NAPA 2009

## **8.4. Specific Threats**

[Information will be available in Draft 2, December 2016]

### **8.4.1. Species**

### **8.4.2. Key biodiversity areas**

### **8.4.3. Conservation landscapes and corridors**

## **8.5. Links to the CEPF Monitoring Framework**

## 9. CLIMATE CHANGE ASSESSMENT

The Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report finds that each of the last three decades were successively warmer than any previous decade since 1850, and that multiple independent datasets show warming in the range of 0.6°C to 1.0°C over the period of 1880-2012. The level of carbon dioxide in the planetary atmosphere is higher than at any time in the past 800,000 years and in May 2013 it reached 400 parts per million – a symbolic threshold of continuing man-made impacts on the global atmosphere. The report notes that many extreme weather and climate events have been observed since the middle of the twentieth century. Ice sheet losses were substantial, glaciers have diminished and the sea level has risen.

Temperatures are generally rising across the hotspot. The increases vary from 0.2°C to 0.4°C per decade over the last 40 years. Spring and fall seasons exhibited the largest warming trends. Winter temperatures increased in the southern lowlands and mountains of Central Asia, but the cold spells of 2008 and 2012 have reduced the significance of this trend. In the Tarim basin of China, precipitation increased by 20 percent between 1960 and 2000 (Rumbaer 2015). Higher surface temperatures result in increased evaporation and reduced soil moisture content, especially during the dry summer months, thereby amplifying the risk of droughts in lowlands and reducing the amount of surface run-off in mountains.

National and regional climate projections indicate increase in temperatures and precipitation across the Mountains of Central Asia hotspot and the major loss of the glacier cover by the end of century. Adoption of the 2015 Paris Agreement and its effective enforcement by all nations may lead to the abatement of pressures on the global climate system and consequently less dramatic climatic and ecosystem changes in the hotspot by the end of century (2070-2100). But projections based on current levels of emissions and high emission scenarios, such as IPCC RCP 8.5, show a temperature increase between 1°C and 5°C and growth in precipitation by the end of the century (reference; IPCC, 2013; Mannig et al., 2013).

Glaciers in the hotspot may shrink by as much as half by the mid century. Small and low altitude glaciers may vanish completely. The Tian Shan No 1 Glacier, located in China and is Urumqi's source of water, had shrunk by 17 per cent from 1.95 km<sup>2</sup> in 1962 to 1.62 km<sup>2</sup> in 2014, with the accelerating speed of the ice loss since the 1980s (reference). Local authorities in China have banned tourism, restricted vehicles, grazing and mining activities nearby this and other glaciers to reduce additional pressures of the nival-glacier ecosystems in addition to global warming (reference). The large glaciers of the Pamir and Tien Shan did not reduce significantly. Since the first instrumental observations begun in the early 20th century the Fedchenko Glacier in central part of the Pamir retreated by 1 km and lost around 5 km<sup>3</sup> of ice. The area of the glacier has reduced less than 0.5 per cent, length by 1.5 per cent, and ice volume by 3.5 percent (reference). From 1927 to 2010, the Zeravshan glacier in the Pamir-Alai has retreated by 2.5km or 10% in length (reference). Numerous small glaciers have melted more significantly due to warming. The area and ice stocks in glaciers within the key mountain river basins of the hotspot – Vakhsh and Panj – that form the large Amu Darya River shared by Afghanistan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan could reduce by half in a scenario of 2°C warming and little change in precipitation (reference). As a response to this, Tajikistan launched the State programme



on glaciers monitoring and protection in order to take coordinated action to preserve these valuable natural resources for as long as possible (reference).

### **9.1. Impacts on Human Populations and the Economy**

The number of days with temperature above 40°C has been increasing in the densely populated southern areas of Central Asia. This has a negative impact on agriculture and rural and urban populations affected by heatwaves (reference).

The climate effects on water regimes are highly variable. As glaciers retreat and snow cover patterns change, the hydrological changes in small and medium rivers in the high mountains are becoming noticeable. The flow in rivers fed by glaciers and snowmelt tends to increase, especially in summer, e.g. Sary-Dzjaz and Aksu in the Tien Shan Mountains of Kyrgyzstan and China (reference). In southern hot and dry parts of the hotspot, small rivers and dependent on them economies and communities are particularly vulnerable to flow variability and climate change impacts, especially water deficits in dry years. Mountain glaciers that act as water reservoirs are melting, and thus losing their ability to compensate for low water flows in low-water years.

A recent IPCC report on extreme events and climate change (IPCC, 2012) as well as the national communications of the Central Asia countries to the UNFCCC call attention to the prospect of more damaging extreme weather events in the future.

Water flows in many of the hotspot's rivers are expected to continue around the current levels for the next two to three decades, while in the heavily glaciated basins of the Tien Shan and Pamir increases in flow and summer floods are expected (reference). Flash flooding is common in the hotspot. Because of the heavy sediment and rock content in flash floods, they are often very destructive but this damage is usually confined to a small physical area such as a valley floor. Another type of flooding, which occurs more often in the flatter parts of the hotspot, is either due to rain falling on snow and frozen ground or to rapid snow melt over deeply frozen ground or rapid and massive snow melt in the mountains. This flooding can result in large volumes of standing water in inhabited areas where this water can cause serious damage to infrastructure. The number of glacial lakes is expected to grow as a result of climate warming in the hotspot (Vilesov et al., 2006). Projected warming will also affect the stability and properties of mountain permafrost and glacial moraines, which in combination with the intensified melting associated with climate change may lead to an increased risk of glacial lake outburst floods (GLOFs), but geomorphology is an important factor and conditions vary from place to place.

The extreme weather events resulting from climate change and variability are already imposing additional stress on the use of vital natural resources. Drought is an extreme event that comes with the potential for increased water insecurity and serious economic and human consequences. In drought years, the competition for pastures and local water sources increases, creating tensions between the lowlands and the highlands. One view of the prospects for water resources in the mountains holds that the receding glaciers will alter the water regime and worsen the water management problem so that more reservoirs will be needed to regulate seasonal flows (reference). Another view holds that melting glaciers and additional precipitation may damage mountain infrastructure, and that the water deficits are a long-term issue.

Climate variability and change affect pest and insect breeding and spearing conditions. In the southern Tajikistan, an outbreak of cotton budworm halved the cotton harvest. In 2007 locust destroyed 35,000 ha of crops and caused considerable damage (reference). Due to climate warming and insufficient forest protection measures, the area of forest affected by pests and diseases increased in Tajikistan and Kyrgyzstan (reference).

The health effects of extreme heat can be serious. Higher temperatures, particularly in summer, are expected to worsen the already difficult work conditions of agricultural fieldworkers in southern lowland parts of the hotspot (reference). Summer high heat has affected pregnancies, and resulted in birth anomalies related to exposure to summer heat late in pregnancy (Kayumova 2013).

As average temperatures increase, diseases are likely to spread more easily, thus adding threats to both animal and human health. Heat stress contributes to cardiovascular disease, and warming patterns can increase the risk of malaria outbreaks. Heavy rainfall in areas with inadequate water supplies and substandard sanitation can increase the risk of infections such as typhoid, salmonellosis and dysentery (reference).

The increase in extreme weather events is likely to increase short-term displacements and migration, and the degradation of the ecosystems that sustain livelihoods is expected to accelerate both seasonal and long-term migration. Whether the causes are economic or environmental, migration has been an effective strategy to maintain stability and reduce poverty in the region.

## 9.2. Impacts on Biodiversity

The biodiversity hotspot of the Mountains of Central Asia is also the hotspot of globally important agro-biodiversity from which cultivated plants have originated. The hotspot harbors wild relatives (landraces) of important agricultural crops and domesticated fruit and nut trees that possess resistance and tolerance to pests, diseases and climatic stresses. Some of them are likely to be well adapted to changing climatic conditions, therefore conservation and sustainable natural resources management under climate change conditions represent one of the best ways for local communities to maintain and improve their livelihoods in the face of climate threats.

Limited comprehensive and coordinated studies were conducted in the hotspot on climate change and biodiversity. Some of the existing studies implemented as part of the climate adaptation or national communication projects show interesting results, but the mosaic of the regional impacts remains incomplete. Synthesis of studies lead to the following conclusions: The mountain forests and pastures are likely to move up in elevation and change in areal extent in response to rising temperatures, particularly in Kyrgyzstan, Tajikistan and Uzbekistan, but whether higher elevation soils and other conditions will support these ecosystems is something of an open question. Productivity of mountain forests may reduce and slow-growing juniper forests (*Juniperus turkestanica*) could be particularly affected by climate change.

In Turkmenistan, decreases in rainfall and increases in temperature have already contributed to the drop of productivity of the natural desert pastures. At the same time, climate warming there resulted in habitat changes and arrival of some species new to the region, such as gray crane (*Grus grus*), *Pandion chaliaetus*, *Larus hyperboreus*, *Stercorarius longicaudus*, *Lanius senator*.

**Table \_\_. Climate change effects on biodiversity**

Possible effects	Likely indicators and consequences
Earlier bird arrival, earlier appearance of the insects in the northern hemisphere	New wintering areas for some birds: avocet ( <i>Recurvirostra avosetta</i> ), ruff ( <i>Philomaxis pugnax</i> ), wood sandpiper ( <i>Tringa glareola</i> ), redshank ( <i>Tringa totanus</i> ) and earlier spring arrival
Shift in habitat extent for some plant species and animal ranges	Elevation changes in the spread of the mountain forests and changes in bird and mammal habitats ( <i>Juniperus turkestanica</i> , <i>Malus sieversii</i> , <i>Juglans regia</i> , <i>Cursorius cursor</i> , <i>Phalacrocorax pygmaeus</i> , etc).
Increase in pressure levels for threatened species and unique ecosystems and endemic species	Climate change combined with fragmentation and overuse of the mountain ecosystems has already driven gazelle ( <i>Gazella subguttarosa</i> ) and bustard ( <i>Otis tarda</i> ) off the Western Tien Shan Mountains. Other species, including tortoise ( <i>Agriocnemis horsfieldi</i> ), corsac ( <i>Vulpes corsac</i> ), jerboa ( <i>Allactaga jaculus</i> , <i>A.severtzovii</i> , <i>A.vinogradovi</i> ) diminished in numbers and extent of occurrence.
Changes in water quality and quantity and impacts on freshwater species and ecosystems	Reduction of water quality in small mountain rivers (Karjantau, Nuratau). Severe impacts of water deficit and low water impacts on delta ecosystems. Increase in irrigation demand due to higher evaporation and, consequently, higher stress on available water resources.

Source: Synthesis of information from the national communications on climate change

Recent research (reference) on the likely impacts of climate change using a homologue approach and soil-climate modelling conducted in fruit and nut forest areas of Tajikistan shows air temperatures will have increased by 3°C in 2050, and considering that the adiabatic lapse rate for the local mountains is 0.6°C per 100 meters, climatic conditions at given forest sites today will prevail in 2050 at homologous sites that are 500 m higher in elevation, where forest can potentially grow if soils and moisture conditions are appropriate. Such significant and rapid ecosystem change may require a set of adaptation measures, both in-situ and ex-situ, and flexible long-term planning of natural resources and land use management by the authorities and local communities. In the absence of adaptation measures, some species or ecosystems could be seriously affected and face a growing risk of reduction, if not extinction. Agrometeorological observations reveal shifting biological phases, such as earlier blooming of apple (reference).

Forest degradation, overuse and fires release carbon and contribute to carbon dioxide emissions, formation of regional dust storms and deterioration of local microclimates. The problem of wildfires, dust storms and flashfloods in the deforested areas is relevant for the entire hotspot because they create extensive ecological and economic damage. It is particularly important for China, Kazakhstan, Kyrgyzstan and Tajikistan, where sustainably managed forests can reduced risks of extreme events soil erosion spurred by climate change, absorb a significant portion of emissions and promote agro-biodiversity conservation. The occurrence of numerous relict and paleoendemic species in the hotspot is evidence of the ability of ecosystems to adapt to significant environmental changes. Mountain forests are made up of resilient tree species that have experienced

intense climate changes in the past. Therefore, they may play a significant adaptation role, and become an important element of agro-biodiversity conservation.

### **9.3. Mitigation and Adaption Opportunities**

The effectiveness of the response to climate change in the hotspot will depend on the capacity of the region to adapt and to enhance its resilience. Ecosystems and economic sectors with a high capacity to adapt are less vulnerable to the effects of climate change, and strong, stable economies and effective governance improve adaptive capacity, while healthy ecosystems ensure higher resiliency.

#### **9.3.1. Regional Responses**

Several organizations at the regional level have the potential to contribute to Central Asia's collective capacity to respond to climate change challenges. As the only regional organization with all five Central Asia states as members, the International Fund for Saving the Aral Sea (IFAS) serves as a political structure for discussion and management of regional environmental issues. The organization has launched regional climate assessments and has sponsored glacier research, but its efforts to secure international donor support for climate funding have been more passive than proactive. The IFAS does not include Afghanistan (although the country is part of the basin) and China.

At the regional level, the Climate Adaptation and Mitigation Program for the Aral Sea basin (CAMP4ASB), designed with support of the World Bank, hosted by the IFAS and implemented by CAREC, is expected to become the main regional climate cooperation and policy coordination platform since 2016. At the time of writing CAMP4ASB was in the inception and planning phase of regional and country-specific responses. There are many other smaller (in financial scale) regional initiatives that aim to promote ecosystem and landscape adaptation and agriculture resilience to climate change in the hotspot.

China is very active in Central Asia and in 2013 established the Center for Ecology and Environment of Central Asia managed by the Chinese Academy of Sciences in Urumqi by the Xinjiang Institute of Ecology and Geography (XIEG) with satellite offices in Almaty, Tashkent, Bishkek and Dushanbe. Together they form a platform for science, technology and education cooperation between China and Central Asia and scientific support to "One Belt, One Road" Initiative lead by China.

A number of other regional centers have been established to serve the needs of environmental, water and climate-related cooperation. The Regional Environmental Centre of Central Asia (CAREC) based in Almaty, Kazakhstan, collaborates with governmental and non-governmental partners, maintains national offices in each of the countries and is implementing climate change projects across the region. Other regional centers – on hydrology (under IFAS) and on glaciers (under UNESCO) – are supposed to collect and disseminate data and knowledge of regional scale and significance. The Regional Mountain Centre of Central Asia (RMCCA) based in Bishkek, Kyrgyzstan, promotes cooperation for the protection of mountain ecosystems and now focuses its activities on climate change impacts in the mountains and on experience exchange on adaptation. The Central Asia Institute of Applied Geosciences (CAIAG) is based in Bishkek cooperates extensively with scientists from the region and abroad on monitoring of global environmental changes in the mountains and other assessments.

Tashkent hosts the Regional Centre on Renewable Energies. Other regional initiatives include the Central Asian Centre for Disaster Risk Reduction (planned), the Regional Drought Management Centre (planned), the Regional Centre on Climate Technologies (planned), and Regional hub for promotion of green technologies based on Astana EXPO-2017.

The Aarhus Convention under the United Nations Economic Commission for Europe (UNECE) establishes rights of the public to access environmental information, to participate in environmental decision-making and to challenge public decisions made without regard to these rights. In cooperation with UNECE and the Environment and Security Initiative, the Organization for Security and Co-operation in Europe (OSCE) supports a growing network of Aarhus Centres in Central Asia. These centers assist civil society organizations in building coalitions and working with governments at the local, national and cross-border levels.

Regional forest and climate cooperation is growing, but is not very advanced. The ECO (Economic Cooperation Organization) is working with six of the seven hotspot countries to coordinate the management of forests among low forest cover countries and link forest actions with climate actions. REDD+ is one of the main global tools for climate change financing of the forest sector, but so far it has focused mostly on capacity-building and readiness in forest-rich tropical and subtropical regions. Only China, among the hotspot countries, is a signatory to the REDD+ and has vast experience in related projects. In May 2016, Astana hosted the ministerial conference on cross-border cooperation on forests involving all countries of Central Asia and China that will possibly intensify the joint activities on increasing forest cover, forest protection from disease and degradation, and fighting illegal logging and fires.

### **9.3.2. National Responses**

All the hotspot countries, but Uzbekistan, have submitted their intended nationally determined contributions (INDCs) to the UN Framework Convention on Climate Change, with China and Turkmenistan ratifying the 2015 Paris Agreement at the time of writing.

China is the largest emitter of the hotspot. On September 2016 the G20 summit, Chinese leader Xi Jinping announced that, “Green mountains and clear water are as good as mountains of gold and silver. To protect the environment is to protect productivity and to improve the environment is to boost productivity.” China is taking and planning major domestic actions to improve energy efficiency, install renewable, curb carbon emissions and expand afforestation programs, including in Xinjiang. One of the largest in the world wind parks has already been established there and is growing. In Xinjiang wind power capacity already reached 25 per cent of the province’s total generation capacity.

Kazakhstan’s GHG emissions reached their highest level in 1990 at 357 million tonnes of CO<sub>2</sub>-equivalent, and in 2014 were 20 per cent below that level. GHG emissions in the energy sector account for more than 85 per cent of total emissions. In order to tackle climate change, Kazakhstan has adopted comprehensive and modern environmental laws, green economy strategy in addition to launching carbon emissions trading through permits and caps. There are incentives for renewable energy and energy

efficiency projects and the country will host the international Astana EXPO-2017 “Future Energy”. Several wind and solar energy parks are under development, mainly in the windy steppes and deserts of the country, and small hydropower is expanding in the mountains.

Kyrgyzstan’s climate-related activities include a national strategy for sustainable development 2013-2017 and a national program and laws for improving energy efficiency and renewable energy. The country has identified priority directions for adaptation to climate change with sectoral action plans, and has established a high-level inter-sectoral and inter-institutional climate dialogue platform.

Tajikistan has adopted a national climate change mitigation action plan and climate adaptation strategy. Other climate-related national initiatives include strategies on glaciers, energy efficiency, small-scale hydropower, disaster risk reduction and forests.

In Turkmenistan, the National Climate Change Strategy of 2013 lays out the policy framework for building climate resilience and a low-emission economy. The country has invested significant efforts to reduce GHG emissions by adopting several mitigation policies. In terms of adaptation, Turkmenistan has initiated policies that aim to improve its agricultural and land management practices and advance socioeconomic reforms.

Uzbekistan is one of the region’s leader in Clean Development Mechanism (CDM) projects, and its climate-related investments are substantial. Major investments are planned to solar energy development and improving energy efficiency in the residential sector and industries.

Afghanistan has developed national adaptation measures and is implementing a number of climate projects, but within the hotspot area (Wakhan), not much is happening.

### **9.3.3. Responses at the Household Level**

A relatively well-educated Central Asian population is one positive legacy of the Soviet era. In Chinese part of the hotspot investments are growing for education and research. The literacy rates in the hotspot countries are generally comparable to those in countries with developed economies, except for Afghanistan.

Resilience to extreme weather and climate change at the household level is related to income and education, and those households with sufficient incomes and educations are likely to be better prepared for any climate shocks. In addition, income from diverse sources adds to economic resilience by protecting households from the loss of income from a single source (World Bank SDU SDN 2011).

Within the hotspot, Tajikistan in its entirety is recognized as highly vulnerable to climate change, with Afghanistan and Kyrgyzstan coming next. In Tajikistan, major international investments to climate change adaptation have contributed to raising awareness and provided incentives for climate responses at the household and local governance levels. In Kyrgyzstan, CSOs were particularly active on catalyzing climate actions by citizens and conservation of high altitude landscape species, such as snow leopard.

## 9.4. Review of Major Climate Change Initiatives

Financial assistance for climate change projects across different sectors in Central Asia is becoming a more prominent part of the work of development banks, the United Nations and the bilateral donors. The European Union (EU) has representatives in all the Central Asia countries, and is interested in promoting climate change awareness and actions in the region, emphasizing the climate mitigation priorities of the EU. Bilateral cooperation offices and organizations of Germany, Switzerland, Japan, the United Kingdom and the United States often integrate climate change into the development projects they sponsor.

China and Kazakhstan are allocating significant domestic resources to implement a green economy. The other countries in the hotspot have intentions to advance climate resiliency and to pursue low-carbon development, but have limited financial resources on their own. The major climate funding is now coming to Tajikistan via the Pilot (Strategic) Program for Climate Resilience (PPCR). Kyrgyzstan is also eligible and is planning to establish the implementation mechanism or secretariat for PPCR implementation in the near future. Afghanistan as a least developing country is eligible for climate funding too and is currently receiving diverse assistance from the range of international donors. In general, international climate funding catalyzed significant interest and helps countries adopt climate-resilient development paths in energy, agriculture, land use and other sectors.

Until recently the Global Environment Facility (GEF) has been the major source of international environmental and climate funding in Central Asia. The Green Climate Fund (GCF) is likely to provide important new opportunities for Central Asia to address climate change concerns while strengthening their economies, reducing poverty and improving environmental performance. Those who receive grants and implement GEF projects in Central Asia mainly include national government agencies, sometimes with the participation of non-governmental organizations. Building and maintaining productive and effective relationships are keys to success from every perspective.

As members of the UNFCCC, each of the Central Asian countries has nominated institutions to meet its convention obligations. Kazakhstan, Kyrgyzstan and Tajikistan have each created climate change centers or departments, all of which work with domestic partners to meet the UNFCCC requirements. Some countries have developed national strategies and actions plans, and have launched projects on mitigation and adaptation. Kyrgyzstan's Climate Change Coordination Commission is probably the best example in the hotspot of the elevation of climate change concerns to the top policy level.

**Table \_\_. International climate funding and links with biodiversity conservation**

Instrument	CHI	KAZ	KYR	TAJ	UZB	TKM	AFG	Central Asia	Silk Road	The entire hotspot
GCF	-	-	-	-	-	-	-	-	-	-
GEF:	-	**	**	**	**	**	**	*	*	*
- SGP	-	*	*	*	*	*	*	X	X	X
- SCCF	-	-	*	*	-	-	-	X	-	-

- LDCF	X	X	X	X	X	X	-	X	X	X
AF	X	X	-	**	**	**	**	X	*	*
NAMA	-	-	-	**	-	-	-	X	X	X
REDD+	-	X	X	X	X	X	-	X	-	-
CIF PPCR		-	***	***	-	-	***		-	-
CAMP4ASB	X	*	*	***	***	**	X	***	**	X
JICA (Japan)	-	*	***	**	**	*	*	*	*	*
Switzerland	-	-	**	**	*	-	*	*	-	-
Germany	-	*	***	***	**	**	**	***	-	-
United States	-	*	**	*	-	-	***	**	-	-
EU	*	**	**	**	*	*	**		**	-
South-South (China)	**	*	*	*	-	-	-	**	**	-
PES	*	*	*	*	-	-	*		-	-
Private (Aga Khan)	X	X	**	**	X	X	-	X	X	X
Private (Christensen)	-	-	*	*	-	-	-	X	X	X

Legend:

X no eligible or not applicable in the current conditions; - not enough information;

Current levels of climate-related funding with links to forests and ecosystems: \* low, \*\* moderate, \*\*\* high

For all countries information mainly refers to their territories within the hotspot, not the entire country areas

## 9.5. The Role of Civil Society

[Information will be available in the second draft, December 2016]



## 10. ASSESSMENT OF CURRENT CONSERVATION INVESTMENT

### 10.1. Governmental Funding

Protected areas and forestry networks are major recipients of government funding, although the bulk of this funding is typically allocated to staff salaries and basic running costs, including patrolling. Governmental funding varies depending on the level of staffing and facilities in each area. In several reserves, CSOs and donors provide additional support for biodiversity monitoring, research and outreach, and development activities for communities living in and around protected areas.

Table \_\_\_\_. Indicative Levels of Governmental Funding for Conservation in the Hotspot

Country	Protected areas	Forests
China	Moderate	Moderate
Kyrgyzstan	Low	Low
Tajikistan	Low	Low
Kazakhstan	Moderate	Moderate
Uzbekistan	Moderate	Moderate
Turkmenistan	Moderate	Moderate
Afghanistan	Low	Low

Legend:

Current levels of funding: \* low (not adequate), \*\* moderate (sufficient), \*\*\* high (optimal)

For all countries information mainly refers to their territories within the hotspot, not the entire country areas

### 10.2. Multilateral and Bilateral Donors

One of the main and traditional multilateral donors in the hotspot countries is the GEF. UNDP, UNEP, FAO and the World Bank are the GEF implementing agencies involved in conservation projects.

The GEF small grants program (SGP) active in all countries, except Turkmenistan, supports civil society groups in the region at local level. GEF SGP covers biodiversity investments, but renewable energy and land degradation initiatives.

Shifting global attention to climate change and the global trend of the increased use of large donors and organizations as vehicles for projects rather than small organizations resulted in reduced funding opportunities for many local and international civil society groups.

Table \_\_\_\_. GEF-6 STAR Allocations for Countries in the Hotspot

Country*	Biodiversity Focal Area (\$)	Total Allocation (\$)
China	58.5	194.5
Kyrgyzstan	1.5	6.6
Tajikistan	1.5	6.3
Kazakhstan	5	22
Uzbekistan	1.8	18.3
Turkmenistan	1.8	10.1
Afghanistan	3.9	11.3

Note: \* = figures for the whole country

**Table \_\_\_\_: Overview of Conservation Investment by Multilateral Agencies**

Donor	Main Countries of Intervention	Main Areas of Intervention	Estimated Total Investment (\$)
FAO (with GEF)	Kyrgyzstan, Tajikistan, Uzbekistan, Afghanistan	Agricultural reforms, forestry and land sector, climate resiliency	
World Bank (with GEF and CIFs)	Kyrgyzstan, Tajikistan, Uzbekistan, Afghanistan	Sustainable agriculture and landscapes, CAMP4ASB regional project	
ADB (with GEF and CIFs)	Kyrgyzstan, Tajikistan, Uzbekistan, Afghanistan	Combating land degradation, water sector reforms, disaster risk reduction, pilot programme for climate resilience	
EBRD (with GEF and CIFs)	Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan	Energy efficiency and renewable energy, waste improvement, infrastructure and rural development	
European Commission	Kyrgyzstan, Tajikistan, Uzbekistan, Afghanistan	Funding for disaster risk reduction, forest and pasture improvements, policy cooperation on climate and environment	
GEF Small Grants Program	Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, Afghanistan	Small grants to domestic CSOs, mainly in support of sustainable use of natural resources, improvement of protected areas, access to energy, awareness	
Other XXX			

**Table \_\_\_\_: Overview of Conservation Investment by Bilateral Agencies**

Donor	Main Countries of Intervention	Main Areas of Intervention	Estimated Investment (\$)
China (CAS)	Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan	Research, training, monitoring, infrastructure	
Switzerland (SDC)	Kyrgyzstan, Uzbekistan, Tajikistan	Water sector reforms, mountain development, disaster risk reduction	
Germany (GIZ)	Afghanistan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan	Major support was provided for sustainable forest management	
United States (USAID)	Afghanistan, Kyrgyzstan, Kazakhstan, Tajikistan	Wildlife conservation (mainly via WCS and WWF), food security, water and sanitation, education, capacity building	
Russia	Kyrgyzstan, Tajikistan	Uranium waste rehabilitation	
Japan (JICA)	Kyrgyzstan, Tajikistan, Afghanistan	Forestry and sustainable natural resource use, disaster risk reduction	
Other XXX			

The majority of bilateral funds over the last five years (2010-2015) to environmental sector in Central Asia came from Germany, Switzerland, Japan, XXX. The United States Agency for International Development (USAID) is a major provider of support to Afghanistan.

### 10.3 Foundations

**Table \_\_\_\_.** Overview of Conservation Investment by Foundations

Donor	Main Countries of Intervention	Main Areas of Intervention	Estimated Investment (\$)
Aga Khan	Kyrgyzstan, Tajikistan, Afghanistan	Humanitarian support, disaster risk reduction, education, local development	
Christensen	Kyrgyzstan, Tajikistan	Support to communities in the high-value natural areas, snow leopard landscape	
Di Caprio	Kyrgyzstan	Species-specific support for snow leopard	
WWF	Kyrgyzstan, Tajikistan, China	Species-specific support for snow leopard, tugai ecosystem conservation	
Panthera	Kyrgyzstan, Tajikistan	Species-specific support for snow leopard conservation, including monitoring	
Other XXX			

## 10.4 Other Donors

The scale of conservation investment by other donors is hard to assess due to numerous donations, in-kind contributions of CSOs and micro-financing mechanisms established by private companies and others.

**Table \_\_\_\_:** Overview of Conservation Investment by Other Donors

Donor	Main Countries of Intervention	Main Areas of Intervention	Estimated Total Investment 2006-2010 (\$)
Private companies	All countries	Projects to compensate for environmental impacts and support biodiversity monitoring, clean-up actions and raise awareness	
CSOs core funds	All countries		

## 10.5 Summary of Investment by Country

[Samples]

## 10.6 Thematic Distribution of Investment

### *Protected Area Management*

[Samples]

### *Landscape-scale Conservation*

[Samples]

### *Species-focused Conservation*

Several species specific conservation programs exist in the region, for example, Snow leopard conservation programme and the Argali action plan. Some of species specific grants have been used to improve monitoring capacities in the relevant protected areas.

### *Sustainable Natural Resource Management*

Sustainable community-based natural resource management is relatively well-funded theme in the hotspot. GIZ, JICA and other donors are interested in supporting local development and the use of such funds by conservation projects to improve biodiversity value of production landscapes. Programs include community-based forestry and pasture management.

[Samples]

#### ***Environmental Education and Awareness Raising***

Many CSOs receive funds and like to work on environmental education and awareness. Site-based projects often include education and awareness components. Posters, leaflets, cartoons, campaigns and websites produced by various CSOs play a key role in public engagement.

[Samples]

#### ***Climate Change***

The most notable funding trend in recent years has been the dramatic increase in funds available for climate change adaptation, particularly in Tajikistan.

[Samples]

#### ***Payments for Ecosystem Services***

Payment for Ecosystem Services (PES) is an evolving concept with good potential to provide funding for biodiversity conservation. PES was piloted in several parts of Kazakhstan, Kyrgyzstan and Tajikistan and is expanding in China.

#### ***Benefit-sharing and Genetic Resource Conservation (Nagoya Protocol)***

[Samples]

### **10.7 Gap Analysis**

XXX

## 11. CEPF Niche for Investment

[This section will be developed in the second draft, December 2016]

## 12. CEPF INVESTMENT STRATEGY

Based on the globally threatened species and KBA analysis, an overview of the direct and indirect pressures on biodiversity and the ongoing conservation investments and efforts, this chapter recommends specific investment priorities grouped into broad strategic directions. These are areas where CEPF can add most value or complement existing investments in biodiversity conservation, justified in terms of the current context for conservation, past experience with conservation initiatives, and opportunities to complement and build upon current conservation investment.


For all priority outcomes for CEPF investment, the most important selection criteria were urgency for conservation action and opportunity for additional investment. Priority species, KBAs and landscapes were selected only where current threats, if not mitigated, were predicted to cause their extinction (in the case of species) or the loss of key elements of biodiversity (in the case of KBAs and eco-corridors) within the next 10-20 years. In addition, priority species and landscapes were selected where there were considered to be great opportunities for CEPF and other organizations to invest in conservation actions by civil society that complement or improve targeting of other investments by governments and other donors.

It will be of paramount importance to take the specificities of the region and the countries – as outlined in the other sections of this report – into account. While there are common issues, the approach to solutions – in particular with regard to the way civil society is organized and active – vary considerably between the Central Asian republics, China and Afghanistan.

### 12.1. Species Priorities

National consultations and the processing of the stakeholder questionnaires provided the basis for the list of priority species. The list includes highly threatened species or those on the brink of extinction, and distinguishes between such high profile species as the snow leopard, for which CEPF may provide complementary funding and less well-known species for which CEPF may provide unique investment. While CEPF focuses on globally threatened species, the national consultations named some species that do not meet that criterion. Some are close to global significance, some are particularly well-preserved populations, and some are significant subspecies or are geographically distinct. These species may not appear on the IUCN Red List, but are red-listed in the country or countries. The consultations and stakeholders proposed some endemics to be included on the list, and supported their inclusion on the basis that they are globally significant from the genetic point of view.

The countries set all the priorities on the list. The next step is to review the list from the regional perspective, after which the priorities may change.

[See table in the annex 

## 12.2. Key Biodiversity Area Priorities

The rankings of KBAs followed the CEPF approach – an assessment from the biological point of view to determine the level of threat, and an exploration of the practical factors that determine the feasibility of carrying out a project in a specific place. The country consultations included mapping exercises and a consideration of the rationale for CEPF involvement.

Many KBAs overlap with existing protected areas or lie in the border zones, and the feasibility of working in such areas may be a challenge and a constraint, but may also be manageable. The list of priorities includes more than half of the areas identified as KBAs. As with the species list, the countries determined the priorities, and the next step is to review the list from the regional perspective, after which the priorities may change.

[See table in the annex  and preliminary KBA map]

## 12.3. Landscape Priorities

Some of the landscapes on the priority list are larger ecosystems that encompass several KBAs. Others are based on species biology and considerations of density, range and migratory corridors that enable connectivity. And some are based on existing landscape classifications in use in the countries. The countries set all the priorities on the list. The next step is to review the list from the regional perspective, after which the priorities may change.

[See table in the annex  and preliminary priority landscapes map]

## 12.4. CEPF Strategic Directions and Investment Priorities

This section defines how CEPF will address the challenges of conservation to achieve priority outcomes for species, KBA sites and landscapes. Which direction or priority is relevant for a particular priority species, KBA or landscape depends on specific local ecological, social and economic circumstances. In developing proposals, potential grantees must show that they have an adequate understanding of these local circumstances and which of the strategic directions and investment priorities are relevant to their situation. Strategic directions are summarized in Table \_\_ and described in greater detail below. Comprehensive approaches to some major biodiversity pressures – grazing and poaching, for example – are beyond the scope of CEPF investments, but these threats are susceptible to more modest and targeted interventions. The recommendations here fall into the latter category.

Table \_\_. CEPF strategic directions and investment priorities for the hotspot

CEPF Strategic Directions	CEPF Investment Priorities
1. Address threats to high-value and priority species	1.1. Improve enforcement and develop incentives and alternatives for nature users and collectors 1.2. Promote improved regulation of the collecting, hunting and fishing (exploitation) of high-value species 1.3. Support the development of informal micro reserves 1.4. Provide information for conservation actions and decision-making based on improved monitoring, science and species research

CEPF Strategic Directions	CEPF Investment Priorities
<p><b>2. Improve management of Key Biodiversity Areas with and without official protection status</b></p>	<p>2.1. Facilitate effective collaboration between CSOs, local communities and park management units, and support survey research to enhance protected area networks</p> <p>2.2. Develop and implement management approaches to sustainable use in KBAs outside official protected areas</p> <p>2.3. Develop legal and policy instruments for better site management, and build support for recognition of KBAs</p>
<p><b>3. Support conservation and sustainable management of mountain forests</b></p>	<p>3.1. Support afforestation, reforestation and high-value forest gene pool conservation</p> <p>3.2. Reduce grazing pressures on forests and shrubs</p> <p>3.3. Develop alternative energy sources near settlements</p> <p>3.4. Promote sustainable forest certification and value chains</p>
<p><b>4. Engage communities of interest and economic sectors – including the private sector – in conservation of KBAs and landscapes</b></p>	<p>4.1. Engage hunting associations, tourism operators and mining companies in conservation management</p> <p>4.2. Disseminate best conservation practices in agriculture</p> <p>4.3. Educate infrastructure developers to the presence of KBAs</p>
<p><b>5. Enhance civil society capacity for effective conservation action</b></p>	<p>5.1. Enable and enhance communications between environmental authorities and local communities on conservation issues</p> <p>5.2. Enhance civil society organizations capacity for planning, implementation, monitoring, outreach and communication</p> <p>5.3. Catalyze networking and collaboration</p> <p>5.4. Increase sustainable funding to civil society for conservation actions via capacity building and appropriate mechanisms</p> <p>5.5. Promote civil society efforts to support implementation of national biodiversity strategies</p>
<p><b>6. Conduct targeted education, training and awareness raising to build capacity and support for biodiversity conservation</b></p>	<p>6.1. Invest in the professional development of future conservation leaders through support to education and research programs at domestic and regional academic institutions</p> <p>6.2. Conduct programs on education to engage school children with nature in priority KBAs and landscapes</p> <p>6.3. Engage the media as a tool to increase awareness about KBAs and inform public debate of conservation issues</p>
<p><b>7. Integrate biodiversity priorities into regional and local climate change actions</b></p>	<p>7.1. Support action-oriented research on the impact of climate change on vulnerable species and KBAs</p> <p>7.2. Support science-based actions for conservation of high-value species and vulnerable KBAs in view of the changing climate conditions, altitudinal shifts of ecosystems and land use changes</p>

CEPF Strategic Directions	CEPF Investment Priorities
<p><b>8. Support cross-border collaboration, experience exchange and information sharing on biodiversity</b></p>	<p>8.1. Promote collaboration that enhances conservation outcomes, and improve the long-term effect of actions across borders</p> <p>8.2. Advance the assessment of, and encourage experience exchange and information sharing on, the state of biodiversity, globally threatened species and KBAs</p>
<p><b>9. Provide strategic leadership and effective coordination of conservation investment through a regional implementation team</b></p>	<p>9.1. Operationalize and coordinate CEPF's grant-making processes</p> <p>9.2. Build a broad constituency of civil society groups</p> <p>9.3. Encourage the integration of biodiversity considerations into government and business policies and practices</p> <p>9.4. Monitor geographic and thematic priorities in relation to the long-term sustainability of conservation in the hotspot</p> <p>9.5. Implement a system for disseminating and popularizing information on conservation and the value of biodiversity in the hotspot</p>

#### **12.4.1. Addressing Threats to High-value and Priority Species**

Overexploitation can devastate the populations of species even when their habitat is adequately protected, and can cause local extinctions, reduce the density of the population and so affect its viability, making the species more vulnerable to other natural or anthropogenic disturbances. Some species may be able to withstand limited exploitation, and this may be an effective conservation strategy where exploitation rights can be defined, managed and policed.

Where a species or product is important for local livelihoods and economies, it may be possible to find alternatives or to incentivize changes of behavior. For many species, however, legal protection and enforcement of bans on exploitation are required. Enforcement of regulations, quotas and species-focused programs and action plans may be complex, and often depends on the cooperation of local stakeholders.

One of the obstacles to defining species and site conservation outcomes is the paucity of complete, up-to-date information on biodiversity. There are many opportunities for local stakeholders with simple training to collect useful information, and scientists in research institutes and universities could contribute to advancing knowledge of the distribution and taxonomy of species in the hotspot. Support is required to build local capacity, carry out surveys, and ensure that new information is disseminated widely and effectively. All such data collection is meant to be “action-oriented” per the investment priorities described here.

The national consultations identified the species priorities in consideration of the IUCN Red List and the high value of certain non-listed species. In addition, national red lists, which are legal documents, need to be kept up to date and linked to the IUCN Red List. The updating of the national lists can benefit from the modernity and international expertise that CEPF brings to the process, and updated lists based on more precise information can guide policymakers and conservation efforts.



***Investment priority 1.1. Improve enforcement and develop incentives and alternatives for nature users and collectors***

The lack of government capacity for enforcement creates opportunities for NGOs to supplement the enforcement effort by acting as rangers who patrol communal areas and report to the environmental authorities on any violations. Support for this activity could take the form of providing equipment, such as drones or binoculars, and guidance on how to conduct community patrols. Local initiative groups, jamoats and CSOs may be able to coordinate patrols with the authorities, and may be instrumental in identifying unregistered hunters or flora and fauna collectors.

The compliance with environmental regulations may also benefit from the provision of incentives. Communities may be able to develop as ecotourism and responsible hunting destinations if they manage their resources carefully and sustainably. The task of local CSOs and initiative groups is to develop ideas that fit their communities, and that lead to the potential for the community members to earn more income through conservation efforts than they can through illegal hunting, flora and fauna collection or harvesting.

***Investment priority 1.2. Promote improved regulation of the collecting, hunting and fishing (exploitation) of high-value species***

Success of implementation of species-focused programs and action plans on globally threatened mammals, reptiles, birds and plants can be enhanced through greater involvement of CSOs. CEPF will support approaches that understand the different motivations of different stakeholders exploiting or collecting rare and exotic plants and wildlife. In view of the variety of resource-dependent communities throughout the hotspot, a combination of approaches holds the most promise.

High-value species of mammals (e.g., Argali), birds (e.g., falcons), fish (e.g., sturgeon), reptiles (Central Asia tortoise) and certain medicinal and commercial plants are all subject to regulations designed to protect threatened species and regulate trade, but these regulatory efforts are uncoordinated and may be ineffective at times. Some authorities grant permission to take a certain number of the otherwise protected animals or plants, but do so without regard for what other authorities or scientists may be allowing or advising. CSOs can help set reasonable quotas, develop coordinated controls and provide inputs to governments and international bodies for improved understanding and traceability of illegal collection and trade in priority species.

***Investment priority 1.3. Support the development of informal micro reserves***

For species living outside of protected areas, conservation efforts can be difficult. In response to this situation, CSOs propose the establishment of micro reserves. Legislation throughout the region allows for community-based or private reserves, but the region has no precedent or experience in creating or managing such reserves. The CSOs report that communities are interested, and establishing micro reserves within the currently authorized framework can provide a foundation on which to build.

Through a combination of outreach and the raising of awareness, CSOs can help communities develop informal micro reserves intended to protect KBA trigger species

and wild relatives of crops (genetic resources) outside of existing protected areas. The size of KBAs could be too large for community-level action, but selected high-value or priority species found locally in high numbers could be subject to the protection by a community micro reserve, and anywhere such opportunities exist, communities can establish informal protected areas or encourage land users to apply sound management plans that consider the conservation needs of these high-value and priority species. This could be particularly relevant to plants, but applicable to other taxa too.

***Investment priority 1.4. Provide information for conservation actions and decision-making based on improved monitoring, science and species research***

Species conservation efforts are hampered by lack of clarity on the taxonomy of species, lack of information on the distribution of species, and lack of data on threats and populations on which to base national and global Red List assessments. This is of particular importance for species threatened by overexploitation or habitat destruction, where it is difficult to propose management interventions without knowing basic facts about population size, distribution, and trends. CEPF will support, to a small and efficient degree, data collection efforts that lead directly to action. People in the area – staff of protected areas, interested residents and researchers – can collect useful data if they are equipped with basic skills on identification and survey planning. For some widely known and easily recognized species, collection of records from amateur observers, hunter and fisherman societies and birdwatchers can also yield valuable data and can be used in decision-making. Mapping the current state of priority species and their habitats helps to set baselines and continued monitoring is vital to assess the impact of actions taken.

**12.4.2. Improving Management of Key Biodiversity Areas with and without Official Protection Status**

Protected areas are a critical part of the overall effort for the conservation of KBAs and other locally and globally important biodiversity resources, and are likely to become more so as pressure from land-use change increasingly affects other areas. Ideally protected areas simultaneously accommodate and respect customary local rights and resource use, although this is often not the case and some protected areas are the subject of conflicts over land use (e.g. mining) or agricultural development or are inefficient because of lack of staff, equipment and management capacities (“paper parks”). CEPF will support efforts to improve the conservation status of protected areas that involve engagement between managers of protected areas (where they exist) and other stakeholders, especially local resource users but also the wider local population and private sector players. CEPF will equally support efforts to promote conservation of KBAs outside of protected areas through approaches and means most effective in local circumstances.

***Investment priority 2.1. Facilitate effective collaboration between CSOs, local communities and park management units, and support survey research to enhance protected area networks***

In most protected areas, legal protections and management units reduce the threats from exploitation and development, but are not always efficient in preventing encroachment, unauthorized grazing, plant collection or illegal hunting. Biodiversity monitoring and

patrols provided by the state are often inadequate due to the large size or understaffing of many protected areas. CEPF will support actions that address these challenges, including by working with communities that live around the borders of protected areas and by collaborating with CSOs that can enhance management efficiency and help control the protected areas in close coordination with their management.

The long-term viability of some species depends on the continuing existence of ecological connectivity and buffer zones. The 2006 WWF Econet project in Central Asia demonstrates how to connect protected areas and other high-value biodiversity sites. That work needs to be updated in line with new developments and to include KBAs, and can then be used to inform land-use planning and policymakers across the region.

The initial identification of KBAs in the mountains of Central Asia highlighted that many KBAs are located outside of protected areas, or that trigger species do not always receive adequate attention and protection even within protected areas due to limitations in monitoring or enforcement capacities. CEPF will support efforts of CSOs to conduct field work to strengthen, revise and enhance the existing network of protected areas, and to improve management skills and technical capacities for work in priority KBAs.

***Investment priority 2.2. Develop and implement management approaches to sustainable use in KBAs outside official protected areas***

A number of KBAs in Central Asia were identified outside protected areas. They are typically threatened by a combination of licensed exploitation and unlicensed use. Interventions to protect these KBAs are complex because multiple stakeholders and rights may be involved, and because the objective of management is, in most cases, profit rather than conservation. Success is likely to be the result of long-term engagement, not a single grant, and so CEPF will support initiatives in which there is a clear stakeholder, community or company, with management control and rights over the area and commitment to conservation. This approach will promote awareness of what KBAs are among land managers. Conservation actions might include formalizing community-based management, engaging with business interests to develop sustainable and responsible forest product harvesting, hunting, recreation and other activities.

***Investment priority 2.3. Develop legal and policy instruments for better site management, and build support for recognition of KBAs***

The recognition of KBAs as part of official policy and regulations lends credibility to conservation efforts. CEPF will support efforts to identify critical needs for regulatory development or enhancement. These efforts may include public consultations, enabling experts from universities and civil society organizations to assist policymakers in understanding the issues, or engaging influential stakeholders to build support for recognition of KBAs. CEPF will also support the dissemination of information on laws, policies and training necessary to assist enforcement agencies or affected stakeholders in ensuring that the policy produces the intended effect. Monitoring can help demonstrate this effect, and can provide important feedback that policymakers can use to show that their decisions have benefited communities and conservation.

Approval and adoption by local government is vital not only to ensure sustainability and encourage the chance of replication, but also to ensure that local decision makers actively support the management regime. The recognition of KBAs may appear in local or national biodiversity strategies, development plans and budgets, and spatial plans, and CEPF will support efforts to encourage adoption of conservation outcomes within these documents. This support might include studies to value ecosystem services from KBAs, good practice examples from other areas, and dissemination of information.

### **12.4.3. Supporting Conservation and Sustainable Management of Mountain Forests**

Mountain forests are of particular interest in Central Asia, worthy of their own sustainable management and investment strategy. Resource-dependent communities throughout the region rely on the mountain forests for sustenance, energy, food, income and livelihoods, and the people of the region regard the forests as essential to their survival and protection against disasters. In all parts of the region, the forests are owned by the state. All the forests within the hotspot have legal protection from logging and other commercial exploitation with the exceptions of maintenance and limited community use. The success of sustainable natural resource management in the hotspot, and the provision of ecosystem services such as water regulation, reduction of natural disasters and ecological stability will depend on how the mountain forests are managed.

#### ***Investment priority 3.1. Support afforestation, reforestation and high-value forest gene pool conservation***

CEPF will support afforestation and reforestation efforts in the mountains of Central Asia where community service organizations can work at an appropriate scale to plant native species and contribute to the conservation of high-value forest genetic resources such as wild apple, walnut, pear, apricot, pistachio and other tree species. Community programs may focus on fast-growing or income-generating fruit and nut and fuelwood plantations that aim to reduce pressures on the natural forests in the vicinity of villages and enhance protection from natural disasters, reduce soil erosion and desertification.

#### ***Investment priority 3.2. Reduce grazing pressures on forests and shrubs***

As herders move their stock among the mountain pastures and along the river valleys, the pastures are overgrazed and become deficient in terms of feed. In such circumstances, herders turn to the mountain forests, riverside tugai forests and shrubs in high mountains. Programs to reduce the grazing pressures on forests and shrubs may include campaigns to raise awareness, public patrols, and efforts to improve the availability of feedstock outside the forests. Actions that support natural regeneration of forests and shrubs can be supported. Simple and efficient technologies that prevent cattle from entering or trampling young forests, shrubs and other plantations may help improve forest recovery.

#### ***Investment priority 3.3. Reduce energy-driven pressures on forests through developing alternative energy sources and enhancing energy efficiency of mountain dwellings***

Significant pressure on mountain forests comes from the use of wood for fuel to heat and cook in the resource-dependent mountain communities. In the absence of alternative

fuel supplies, people in the mountains collect fuelwood from the nearest available source. The low energy efficiency of dwellings further increases the demand for energy and consequently the pressures on forest. Programs to develop alternative energy sources and efforts to increase energy efficiency can alleviate those pressures. Additional actions and incentives that link improved energy efficiency and renewable energy with reduced impacts on trees and shrubs could be promoted and replicated.

***Investment priority 3.4. Promote sustainable forest certification and value chains***

The legitimate use of mountain forest resources can actually help sustain the forests and support local livelihoods and trade. Forest products that are certified as being sustainably produced receive a premium price in global and regional markets, and for many countries and consumers, sustainable forest certification is a requirement. The certification itself confers on the products a legitimacy that makes them more attractive and valuable on domestic and foreign markets. Programs and actions that promote sustainable forest certification, improve value chains and introduce modern forest products processing technologies may improve the forest situation and generate benefits for communities.

**12.4.4. Engaging Communities of Interest and Economic Sectors in Conservation of Priority Sites and Corridors in Production Landscapes**

The stakeholders with the greatest resources and capacity, and with long-term interests in production landscapes and ecological services include certain associations and economic sectors. These stakeholders may also have a significant influence over local government decision-making.

Most of the land in the hotspot is state-owned and typically subject to concession-based use, with the type of use defining the landscape. The uses with impacts on biodiversity include agricultural lands (pasture and crop and plantations); concession lands (hunting, mining, tourism); and lands set aside for infrastructure development (roads, canals for irrigation, water reservoirs, rail, power transmission lines, pipelines and urban expansion). The forests in the region have more value as providers of ecosystem services than for resource exploitation, and in this special role are not considered production landscapes.

***Investment priority 4.1. Engage hunting associations, tourism operators and mining companies in conservation management***

Hunting associations, tourism operators, and mining companies share an interest in being able to conduct their activities in the hotspot, and may view their interests as compatible with conservation management. Engaging these stakeholders may include education and awareness raising programs, efforts to encourage stakeholders to consider and incorporate conservation values into their activities, and programs for the rehabilitation of production areas and targeted conservation of globally threatened species and KBAs within and nearby their license and concession areas.

***Investment priority 4.2. Disseminate best conservation practices in agriculture***

The agricultural sector is important economically throughout the hotspot, and offers many opportunities for programs that are mutually beneficial with the conservation of biodiversity. Such programs may include education on soil and biodiversity conservation practices, information exchanges, and coaching by practitioners.

#### ***Investment priority 4.3. Educate infrastructure developers to the presence of KBAs***

The biodiversity hotspot region is geographically strategic to China's One Belt, One Road initiative – an effort in economic diplomacy to revitalize the Silk Road. This initiative makes the region a key area for investments, particularly in infrastructure, for the next 15-20 years. As infrastructure projects move forward, the existence of KBAs in the path of development is crucial information. The global recognition of KBAs triggers the requirement that environmental impact statements consider the effects of development on the KBA. Educating the developers to the specific KBA sites is the first step in ensuring that they take the KBAs into account. Community service organizations and academic or research institutions are well placed to promote recognition of KBAs and to inform developers of their locations and develop actions for their conservation.

#### **12.4.5. Enhancing Civil Society Capacity for Effective Conservation Action**

Civil society organizations report that they need strengthened management, fundraising and skills, and also note that they often lack the knowledge and experience to tackle some of the most important threats to the conservation in the region. Furthermore, many CSOs working on issues indirectly related to conservation – such as pasture management, disaster risk reduction or community development – have difficulty articulating the link between their work and environmental considerations or benefits for conservation. Creating sustained improvements in civil society capacity for conservation is an important aim of CEPF, alongside direct conservation impacts.

In some countries in the hotspot, making grants to CSOs is straightforward, but in others, governmental prerogatives take precedence. Kyrgyzstan, for example, has the region's most diverse collection of civil society organizations, which operate independently from the government, while in Kazakhstan and Tajikistan, NGOs wield significant influence on decision-making by introducing ideas, collaborating on mutual interests and refraining from criticism of the government. The rich tradition of CSOs in Uzbekistan includes ecological movements with many members. These organizations either support government initiatives officially, or act as an unofficial arm of the government to build community support for government projects. There are also several conservation and community groups that work independently, though access to the funding is rather complicated. In China and Turkmenistan most influential CSO conservation players are related to academia, geographic and nature protection societies or associations of forest users, hunters and fishermen.

Pressure from unsustainable local natural resource use is a challenge for KBAs across the hotspot. Models of sustainable, community-based management in a variety of situations are important to convince government and local stakeholders that such approaches are possible. Likely activities include identification of links between livelihoods and resources, strengthening of local institutions for management, creating

links to markets and economic opportunities that give the sustainable management greater value, and building networks of support for the community-based initiatives.

***Investment priority 5.1. Enable and enhance communications between authorities and local communities on conservation issues***

Legislation and regulations are rapidly evolving across Central Asia, and local communities have a hard time keeping up to date. The legal framework for conservation and environmental protection at large is poorly understood among the population and local officials, and almost no one is working to inform the people. As a result, national action plans, legislation and regulations may have no impact at the local level. NGOs can enable and mobilize local communities and authorities to work collaboratively to achieve a level of knowledge of the legal framework sufficient for local communities to understand how to act within the law and national biodiversity priorities.

Community service organizations and biodiversity, forest or land user associations can support sustainable natural resources management in part simply by conveying to local communities accurate information regarding the national biodiversity-related strategies, laws, rules and regulations. CSOs with experience in government relations and solid experience in the management of environmental issues and public communication are well placed to serve as credible conduits of information. Knowledge of one's rights and responsibilities is a prerequisite for behavior that is legal and responsible.

If authorities do not have accurate knowledge of local concerns, they are less likely to develop policies and measures that support sustainable resource management by communities. Community organizations and associations can convey to the authorities the concerns of the people in the local communities. Again, those with experience in government relations, access to information and citizen rights, such as Aarhus centers or jamoat development centers and groups, are well placed to serve as credible conduits of information.

***Investment priority 5.2. Enhance civil society organizations capacity for planning, implementation, monitoring, outreach and communication***

A specific issue repeatedly highlighted by CSOs is the lack of capacity to assess the state of an environment, unsustainable exploitation, and the status of key species and habitats. In the absence of information, they find it difficult to ensure that their work is focused and effective. CEPF will support training in simple techniques for assessment of key species and environmental variables and planning conservation interventions.

CSOs with skills in community development and agriculture, and natural resource-based businesses such as tourism, non-timber forest products, and responsible hunting are likely to be important for the success of conservation activities. CEPF grantees are thus likely to be organizations that are working on livelihoods, social and development issues, and that are aware in a general way of the importance of natural resources and ecological services but lack the knowledge to define these links clearly or to address environmental issues in their programs. CEPF will fund capacity building activities that assist CSOs in understanding the conservation outcomes and enable them to link their work to biodiversity conservation. Priority for this kind of support will be CSOs with a clear commitment to work at priority sites.

### ***Investment priority 5.3. Catalyze networking and collaboration***

Inevitably subsectors within the CSO community (e.g., conservation groups, forest and land user and hunting associations, public information centers, mountain development) tend to be better at networking within their own subsector than with others, and good opportunities for alliances and collaborative working may be missed as a result. Some existing alliances focusing on mountain regions – such as the Central Asia mountain partnership and alliance of mountain communities of Central Asia – have played crucial roles in targeted support and innovations in sustainable mountain development. CEPF will support existing networks and provide mechanisms to communicate initiatives, results and problems between, for example, different CSOs around a KBA. Linking local CSOs to national and international networks will enhance access to sources of information and funding, and thus improve the sustainability of actions.

### ***Investment priority 5.4. Increase sustainable funding to civil society for conservation actions via capacity building and appropriate mechanisms***

Access to funding is a key constraint for many CSOs in the hotspot. Some smaller CSOs become active only when funding is available, and are unable to undertake long-term financial planning. Others “follow the money,” adopting new agendas in response to donor priorities and funding. Neither situation supports the development of a knowledgeable, effective CSO community that can take action in support of conservation outcomes. CEPF will support civil society by training them to be better fund-raisers and financial managers.

CEPF will also support locally appropriate, viable, and innovative mechanisms to increase the broader pool of funding available to civil society. CEPF may support pay-for-performance links between the private sector and CSOs for conservation activities, the creation of innovative funding mechanisms and schemes that generate sustainable funding for civil society and conservation activities.

### ***Investment priority 5.5. Promote civil society efforts to support implementation of national biodiversity strategies***

National biodiversity strategies in the hotspot are focusing on the most urgent threats, but governmental capacities and budgets are often not adequate and do not necessarily cover well the priority species and KBAs identified in the profile. CEPF investments can support CSO efforts to enhance implementation of national biodiversity strategies and the Aichi biodiversity targets within corresponding priority species and KBAs. CSOs can help to enhance understanding and awareness of national biodiversity strategies at local level, contribute to and catalyze local actions.

### **12.4.6. Conduct targeted education, training and awareness raising to build capacity and support for biodiversity conservation in society**

The majority of CSOs active in conservation and biodiversity specialize in education, training, and awareness raising. These activities are, in fact, the core business of the region’s CSOs, and all across the hotspot they have clearance from their governments to operate. These CSOs report that working in these soft measures result in the biggest impact and the highest efficiency. This is a niche where the governments are weak or do



not have sufficient resources or capacities, and without the contributions of CSOs, this work will not be done.

Because the majority of the population in the region is young, and the proportion of students is high, working with the youth actually targets most people. In the absence of well-educated professionals, the sustainability of conservation efforts is not possible, and this strategic direction also aims to assist in the transition of a new generation of professionals.

***Investment priority 6.1. Invest in the professional development of future conservation leaders through support to education programs at domestic and regional academic institutions***

A shortage of suitably qualified conservation professionals and activists is a major barrier to development of local conservation actions and movements in the hotspot. The population in the hotspot is young, with a median age of about 17-25, and high schools, colleges and universities need support in piloting courses and extracurricular activities to study biodiversity and conservation basics, and to nurture and motivate professionals and environmental activists. A complementary approach is to invest in the professional development of the talented individuals in the domestic CSOs through trainings, exchange visits and internships.

CEPF intends to focus on the selective enrichment of existing conservation education programs at domestic and regional academic institutions. Natural sciences education in the region is mired in the 1970s. Curricula need updating, while educators and young researchers need to be connected with knowledge hubs and modern methods. Students need motivation and a sense of the career opportunities that may be feasible.

Educational attainment in post-Soviet Central Asia is marked by a line separating people now reaching retirement age and those in the younger generation. The former have an excellent education, but the education of the latter is weaker. Young professionals can benefit from older generation through exchange programs.

***Investment priority 6.2. Conduct programs on education to engage school children with nature in priority KBAs and landscapes***

Engaging young people in conservation makes for life-long contributors, and schools with field experience produce students with an environmental ethic, and who influence their parents' views. Creative CSOs can invent activities that connect kids to nature, such as planting endemics in school gardens or organizing performances and drawing competitions on priority species and key biodiversity areas, threats and solutions.

While several hotspot countries have state programs and CSO activities related to environmental education and awareness in schools and universities, their effectiveness and coverage are limited and do not link the youth and children with the realities on the ground. National consultations revealed some innovative approaches such as visits to protected areas for school children and organizing student conservation patrols, mobile theaters and clubs. In such activities, protected area staff or leaders of domestic conservation organizations play a role as nature interpreters, and CSOs providing long-

term support to the protected areas can facilitate visits and support field activities such as summer camps and hikes to exploring eco-tourism trails and nature.

***Investment priority 6.3. Engage the media and public environmental information services as a tool to increase awareness about KBAs and inform public debate of conservation issues***

The hotspot has a diverse range of media and public information centers and services, and governments, CSOs and donors made provisions for public participation in decision-making and for improved awareness. Significant though these steps have been, they have proven insufficient to fully explain and convey the biodiversity concerns to the grassroots level and catalyze responses and behavioral changes in civil society. Major CSOs and public environmental information centers as well as civil society networks and services are well placed to spread information and knowledge about KBAs and inform public debate on biodiversity, because they have good connections at the grassroots level and a good understanding of the impacts of policies and projects on biodiversity and local communities. One of the approaches that demonstrated effectiveness has been use of the media festivals, expositions and marches of parks as tools for raising awareness about conservation issues. The public awareness campaigns conducted by CSOs on wild apples, tulips, mammals and other biodiversity themes contributed to the public debate, interest and improved knowledge. This investment priority will consolidate and amplify these and other approaches.

**12.4.7. Mainstream globally important biodiversity considerations into regional and local climate change actions**

Participants of national consultations highlighted very high sensitivity of mountain ecosystems, including forests, grasslands and nival-glacier zones, to climate change. Given that the impacts of climate change are spread across the region, joint studies, data exchange and coordination may improve the quality of the assessments, help develop a consensus for more effective recommendations and improve climate adaptation strategies.

The countries in the region all take climate change seriously, and are interested in adaptation, but knowledge of the connections between climate change and ecosystems remains weak. Donors support climate change projects related to infrastructure, economic development and affected groups, but what is missing is an ecosystem approach and a focus on vulnerable species and KBAs.

***Investment priority 7.1. Support action-oriented research on the impact of climate change on vulnerable species and KBAs***

The growing number of climate-resiliency investments and climate adaptation projects have little or no focus on species and KBAs. Actions that help integrate selected vulnerable species and KBAs can be supported. The findings of action-oriented research and pilot projects can lead to practical applications such as informing the existing major climate initiatives and providing the basis to approach other donors for funding. Such pilot projects can also provide the basis for experience exchange across the region.

High-value resources – whether wild relatives of crops in the Pamir or fruit-and-nut mountain forests of China, Kazakhstan and Kyrgyzstan – are under growing climate

change impacts that are both immediate (pests, diseases, extreme weather) and long-term (geographic and seasonal shifts). Appropriate adaptation actions supported by research and practice are required to ensure the survival of the globally significant biodiversity.

***Investment priority 7.2. Support conservation of species and KBAs in view of the changing climate conditions, altitudinal shifts of ecosystems and land use changes***

Participants in the national consultations noted the possibilities of using ecosystems as protection against climate hazards and natural disasters. The entire region is vulnerable to flooding, flash floods and droughts, and healthy ecosystems are known to moderate the impacts of these events. Some native species are well adapted to the extremes, and CEPF will support projects that conserve and enhance such species. Such projects may, in fact, be used to leverage funds from major climate change donors.

The wild species of domestic crops are among those well adapted to climate extremes, and the conservation of these species have tangible outcomes for agriculture. The development of hybrids can make domestic species more resilient, and the transfer of certain cereal species from nearby locations may help growers adapt their crops to the changing climate conditions. Small local gardens that specialize in hardy local varieties can serve as sources for area agriculturalists.

**12.4.8. Support cross-border collaboration, experience exchange and information sharing on biodiversity**

Many of the protected areas and KBAs in the hotspot lie on or near a border. Conducting work in these border areas can be complicated by difficult access and national security concerns. An inability or unwillingness to work collaboratively across borders may result in these vital biodiversity areas being ignored.

***Investment priority 8.1. Promote collaboration that enhances conservation outcomes, and improve the long-term effect of actions across borders***

While there are seven different countries in the hotspots, all of them share common conservation landscapes and numerous KBAs face each other on the borders. Migratory species and routes, species aggregation and bottlenecks, climate change impacts on the mountains and shifts in ecosystems all require cross-border cooperation. Previous and ongoing conservation efforts, including GEF projects, demonstrated that cross-border cooperation on biodiversity and land resources could be rather challenging in the managerial and governance context, but they also show many successful examples that encourage continued efforts and synergies. This investment priority aims to complement the existing regional action plans, multi-country initiatives and emerging cross-border cooperation dynamics – such as China-Central Asia and Afghanistan-Central Asia – and to contribute to the long-term impacts of CEPF investments across the region.

***Investment priority 8.2. Advance the assessment of, and encourage experience exchange and information sharing on, the state of biodiversity, globally threatened species and KBAs***

The knowledge of globally threatened biodiversity and its distribution is not adequate for ensuring comprehensive biodiversity conservation in the hotspot. This problem

exists across most taxa that have been used to trigger the identification of KBAs in the hotspot. It is particularly acute for sites in Kyrgyzstan, Tajikistan and China, where the areas involved are especially large or inaccessible, the biodiversity especially rich, or where research efforts have been restricted by a lack of security, capacity and resources. These uncertainties have led to a large number of KBAs being considered candidates rather than confirmed sites. In particular, efforts are needed to map restricted range species and categorize animals and plants according to their conservation status and IUCN Red List categories; the absence of up-to-date and spatially precise assessments hinders planning and prioritization of actions in individual countries and in general across the hotspot. During the profiling exercise, a major challenge was to consider the hundreds of endemic plant species. This investment priority will therefore support targeted field surveys and desk-based assessments to fill gaps in biological knowledge. This investment priority will also contribute to the regional assessments on the state of biodiversity, and strive to improve information sharing protocols and accessibility of the wealth of biodiversity data existing in the region and good practices generated by numerous GEF and other projects.

#### **12.4.9. Providing Strategic Leadership and Effective Coordination of Conservation Investment through a Regional Implementation Team**

CEPF will implement its grant program through a regional implementation team (RIT) located in the hotspot. The RIT will promote and administer the grant-making process, undertake key capacity building, maintain and update data on conservation outcomes, and promote the overall conservation outcomes agenda to government and other stakeholders.

##### ***Investment priority 9.1. Operationalize and coordinate CEPF's grant-making processes***

Guided by the identification of priority sites and species within this ecosystem profile, the RIT will promote the opportunity for applying for grants by issuing requests for proposals tailored to specific issues and geographies. Through the provision of appropriate materials and training, the RIT will ensure that local CSOs are not denied the opportunity to participate because of language difficulties or an inability to articulate project ideas in a formal proposal or difficulties in accessing the Internet. The RIT will also ensure that applicants, grantees and other stakeholders are kept informed of decisions on grants, new opportunities to apply as they arise, and the overall progress of the CEPF program. The RIT will develop, as needed, formal collaborative arrangements with government departments, universities and other organizations that have responsibilities or resources important to the overall implementation of the program. Coordination with other grant-making organizations such as the GEF Small Grant Program may also create opportunities for joint grant making or capacity building.

##### ***Investment priority 9.2. Build a broad constituency of civil society groups***

The conservation outcomes identified in the ecosystem profile are aligned with conservation priority setting by governments and NGOs in the region. The RIT will promote the conservation outcomes as an agenda for conservation, including synergies with other initiatives within the region and with national and international stakeholders. The RIT may either serve as the lead entity for conservation in the hotspot, or may identify and promote others to take this role.

***Investment priority 9.3. Encourage the integration of biodiversity considerations into government and business policies and practices***

The RIT or other appropriate entities will support civil society to engage with government and the private sector and adopt their results, recommendations, and best practice models. This includes engaging directly with private sector partners and ensuring their participation in implementation of key strategies. It also includes facilitating the creation or strengthening of conservation-oriented networks.

CEPF and the RIT will seek opportunities to promote conservation outcomes as an agenda for conservation in the hotspot at national and international levels. Likely entry points with government include national biodiversity strategy and action plans; country reports and interventions to the CBD, CITES, the Bonn Convention (CMS), the Ramsar Convention, and the UNFCCC; and sectoral, species and site action plans. Engagement with major conservation organizations and international agencies working in the hotspot should aim to mainstream conservation outcomes into their strategies and programs. International groups and agencies managing global datasets on conservation, such as IUCN, BirdLife, and the CBD secretariat, also need to be kept informed of changes and improvements in the definition of conservation outcomes.

Considering the growing role of China in investments and business development in the countries of Central Asia and Afghanistan, RIT will aim to strengthen the links between Chinese infrastructure and other investments and KBAs, and seek opportunities for co-financing from China for conservation efforts as part of the One Belt, One Road initiative, academic and environmental cooperation programs and other initiatives.

***Investment priority 9.4. Monitor geographic and thematic priorities in relation to the long-term sustainability of conservation in the hotspot***

The RIT or other appropriate entities will monitor the overall status of KBAs and corridors to assess the impacts of the program and to provide information for conservation planning. Monitoring of land-use change using satellite images is increasingly near-real time and efficient, but the use of officially recognized data sources remains important. Monitoring of this information, plus information on civil society, sustainable financing, the enabling environment, and responsiveness to emerging issues, will help CEPF report on the overall health of the hotspot and the need for continued donor engagement in the region.

***Investment priority 9.5. Implement a system for disseminating and popularizing information on conservation and the value of biodiversity in the hotspot***

The RIT or other appropriate entities will create a mechanism for the collection and dissemination of results to government agencies and NGO networks.

A number of different groups, websites and forums exist to share information, but most of these data have not yet been compiled and used effectively for conservation planning. This ecosystem profile is a first attempt to do this, and CEPF may establish a mechanism, based in suitable institutions, to collate information and make it available in a form that is accessible and useful for stakeholders involved in conservation in the region.