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JORDAN BIODIVERSITY ANALYSIS

September 2019

This publication was produced for review by the United States Agency for International Development. It was prepared by DAI.

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Contract Information:

This work is made possible by the generous support of the American people through the United States Agency for International Development through the contract number AID-OAA-I-14-00014/AID-OAA-TO-15-00020 for the Biodiversity Results Integrated and Development Gains Enhanced (BRIDGE) Project. BRIDGE is funded and managed by the USAID Bureau for Economic Growth, Education, and Environment/Office of Forestry and Biodiversity.

Contractor: DAI Global, LLC

Date of Publication: September 2019

Cover photo: Wadi Mujib Canyon. This canyon and river are in the Mujib Biosphere Reserve, part of the UNESCO Man & the Biosphere Program international network of biosphere reserves. These reserves are laboratories and models for developing a sustainable and resilient balance between humans and nature. (Source: Wikipedia https://en.wikipedia.org/wiki/Wadi_Mujib)

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ABBREVIATIONS AND ACRONYMS

ASEZA	Aqaba Special Economic Zone Authority
BRIDGE	Biodiversity Results and Integrated Development Gains Enhanced
CBD	Convention on Biological Diversity
CSO	Civil Society Organization
CDCS	Country Development and Cooperation Strategy
CITES	Convention on the International Trade in Endangered Species of Wild Flora and Fauna
CITIES	Cities Implementing Transparent, Innovative, & Effective Solutions
DAI	Development Alternatives International
DO	Development Objective
DOI-ITAP	Department of Interior – International Technical Assistance Program
EDE	USAID Office of Economic Development & Energy
EIA	Environmental Impact Assessment
FAA	Foreign Assistance Act
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
GEF	Global Environment Facility
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
IUCN	International Union for the Conservation of Nature
JOHUD	Jordan Hashemite Fund for Human Development
JREDS	Royal Marine Conservation Society of Jordan
MAB	Man and the Biosphere Program
MoA	Ministry of Agriculture
MoEnv	Ministry of Environment
MoI	Ministry of Interior
MoT	Ministry of Tourism and Antiquities
MWI	Ministry of Water and Irrigation
NBSAP	National Biodiversity Strategy and Action Plan
NARC	National Agricultural Research Centre
NCARE	National Centre for Agriculture Research and Extension
NGO	Non-Governmental Organization
PA	Protected Area
RSCN	Royal Society for the Conservation of Nature
SDO	Special Development Objective
SEED	Sustainable Environmental and Economic Development
SOW	Scope of Work
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNESCO	United Nations Educational, Scientific, and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
USFS-IP	United States Forest Service International Programs
USGS	United States Geological Survey

ACKNOWLEDGMENTS

The analysis team would like to thank all of the individuals interviewed (Annex B – Persons Interviewed), who shared their knowledge and opinions about biodiversity in Jordan. The Senior Technical Advisor and report author would like to thank Dani Newcomb, Haithem Ali, and Farid Musmar, team members from USAID/Jordan, who provided excellent and responsive support during the preparation of this FAA Section 119 Biodiversity Analysis for Jordan.

EXECUTIVE SUMMARY

Purpose of the Analysis

The main objectives of this Biodiversity Analysis are to assist USAID/Jordan to comply with Section 119 of the Foreign Assistance Act and to inform the development of the Mission's new Country Development Cooperation Strategy (CDCS). The analysis:

- Reviews the current state of Jordan's biological diversity;
- Summarizes the legal and institutional context for its conservation and management;
- Describes the direct biophysical threats to the country's ecosystems and species and identifies their causes and drivers;
- Identifies actions needed to reduce and/or mitigate the causes and underlying drivers of those threats in the current political, economic, and social context;
- Describes the extent to which USAID/Jordan's current programs are contributing to actions needed;
- Identifies opportunities for USAID/Jordan to contribute to actions needed in the future; and
- Describes and recommends opportunities through which USAID/Jordan could increase the effectiveness, sustainability, and resilience of its sectoral development objectives by taking advantage of the benefits of biodiversity to human social and economic development.

This analysis fulfills a legal requirement of the Foreign Assistance Act (FAA), Section 119, which requires that a Biodiversity Analysis be conducted in conjunction with the development of new U.S. foreign assistance strategies and programs. It is also intended to identify opportunities to better integrate the Mission's portfolio across development sectors by suggesting linkages of biodiversity conservation and natural resources management with the Mission's economic development, democracy and governance, water resources, health, education, and gender programs.

Methods

This analysis was, for the most part, a desk study conducted by the Senior Technical Advisor/Consultant. Information for the analysis was obtained mainly from background reports and other documents, including those recommended and provided by USAID/Jordan, and other sources identified through online research. Members of the analysis team from USAID/Jordan provided first-hand information that supplemented the desk research. Some information from key informant interviews and site visits held in Jordan in May 2019 was also used.

Status of Biodiversity

The ecosystems of Jordan, and the thousands of species that comprise them, are a foundation for the country's economy and the livelihoods of its people. Biodiversity is the source of diverse benefits, providing ecosystem products, services, and non-material benefits. This biodiversity is thoroughly described in a number of recent documents prepared by the Government of Jordan and its international and non-governmental organization partners, including the *Fifth National Report on the Implementation of the Convention on Biological Diversity* and the *National Biodiversity Strategy and Action Plan 2015-2020*. Conserving, sustainably using, and in some cases restoring Jordan's ecological resources takes place in the context of the system of laws, policies, and institutions that have been put in place for that purpose, including Jordan's system of protected areas. That political, legal, and institutional context is summarized in this report.

Threats, Causes, and Drivers

This analysis uses the threats-based approach that guides USAID's biodiversity programming as its conceptual framework. We first identified the direct, biophysical threats to Jordan's ecosystems and species, as reported in the documents we reviewed. The most important direct threat is the conversion, loss, degradation, and fragmentation of natural ecosystems. Overexploitation of particular species is the second-most serious threat, and introduction of invasive non-native species, pollution, and climate change round out the list. Climate change is a potential threat of unknown magnitude that may accentuate other direct threats, especially habitat degradation. Next, we identified the causes and the deeper, underlying drivers of the direct threats. Although many factors act as causes, they generally fall into one of three categories: 1) political, institutional, or governance-related; 2) economic; or 3) social (related to, for example, cultural beliefs, lack of awareness, information, science, or technology). Demographic pressure from Jordan's high population growth rate is a driver that underlies many of the political, economic, and social causes of threats to the country's biodiversity.

Actions Necessary

FAA Section 119 calls for an analysis to identify the "actions necessary" to conserve biological diversity. To identify "actions necessary," we reviewed a range of documents prepared by the Government of Jordan within approximately the past five years. In addition to biodiversity documents prepared for the Convention on Biodiversity, we reviewed the *National Action Plan to Combat Desertification*, *National Rangeland Strategy*, *National Water Strategy 2016-2025*, and *National Climate Change Policy 2013-2020*. Interviews with key informants in Jordan were also a source of actions needed. Actions needed that were mentioned repeatedly clustered naturally into 10 thematic categories:

- 1) Integrate biodiversity and ecosystem services considerations into land use and coastal zone strategies and plans and national economic accounting systems.
- 2) Increase awareness and knowledge of the value of biodiversity and ecosystem services among national decision-makers and the public.
- 3) Develop mechanisms for landscape-scale environmental protection and biodiversity conservation outside of protected areas.
- 4) Incorporate knowledge of linkages between vegetation and hydrology (ecohydrology) into national water strategies and plans.
- 5) Develop a comprehensive national rangeland strategy with emphasis on ecosystem services and decentralized governance.
- 6) Strengthen decentralized natural resources governance at the governorate and municipality level.
- 7) Strengthen environmental and biodiversity safeguards, especially for mining and tourism sectors.
- 8) Implement integrated coastal zone management for Aqaba that ensures the protection of coastal and marine biodiversity.
- 9) Strengthen capacity and commitment of the Ministry of the Environment and National Biodiversity Committee to achieve actions necessary.
- 10) Build institutions for better coordination of biodiversity-relevant government agencies and CSOs/NGOs.

The actions necessary for biodiversity conservation are those that remove or reduce the causes and drivers of the direct, biophysical threats to Jordan's ecosystems and species. Details about what would

be needed to implement each of these actions-needed themes are discussed in the final two sections of this report.

Extent to Which Current Programs Contribute to Actions Needed

FAA Section 119 requires that this analysis examine “the extent to which the actions proposed for support by the Agency meet the needs thus identified.” In addition to this *prospective*, forward-looking legal requirement, USAID’s 2017 guide to “best practices” for conducting these analyses requests that they describe how the Mission’s *current* portfolio of activities contributes to actions needed for biodiversity conservation. Several small activities supported by USAID/Jordan have recently contributed in a direct way to actions needed. One, supported by the Economic Development and Energy Office, involves capacity building of the Royal Society for the Conservation of Nature (RCSN), which manages many of Jordan’s main protected areas. This support focuses on the business aspects of protected-area tourism, including refining business models and improving marketing and sales, financial management, and workforce capacity in business operations. Another recent activity with a biodiversity-conservation focus was the Sustainable Environmental and Economic Development (SEED) Program, managed in the Water Resources and Environment Office. SEED, which ended in December 2018, provided a mechanism to engage the advisory and technical capabilities of the United States Forest Service International Programs (USFS-IP). USFS-IP worked with the RCSN on protected area management and tree nursery development. The Democracy and Governance Office’s CITIES Program may be contributing indirectly to decentralized natural resources governance at the governorate and municipality level through general support for decentralization.

Opportunities for the Future

In the spirit of USAID’s 2014 Biodiversity Policy, which describes biodiversity as an essential foundation for human development and calls for it to be integrated as a cross-cutting issue in all development sectors, this analysis has identified two kinds of opportunities for USAID/Jordan to consider as it develops its next CDCS. One type of opportunity involves increasing the effectiveness of the Mission’s development objectives in traditional development sectors (e.g., economic growth, democracy and governance, education, health) – and also making them more sustainable and resilient – by taking advantage of the benefits of biodiversity to human social and economic development. In this view, biodiversity conservation is the “means” to a development “end,” and the actions needed for biodiversity conservation are tools for achieving sectoral development objectives. For example, supporting the decentralized, participatory planning processes needed to sustainably manage rangelands or ecosystem services in watersheds can bring together diverse stakeholders and begin to build their capacity for improved governance in general, thus supporting a broad democratic governance objective. A second type of opportunity is to incorporate support for conserving natural ecosystems and species in the activities of a development sectors. In this view, carefully designed activities in any sector can support biodiversity conservation objectives while also achieving their own goals.

The timing of this FAA Section 119 analysis in relation to the Mission’s CDCS development process provides an opportunity for identifying and recommending ways of enhancing development through future biodiversity conservation actions. This analysis provides the Mission with a menu of opportunities for integrating biodiversity considerations into its development portfolio as it develops its next CDCS. USAID/Jordan should consider developing activities that integrate biodiversity issues into one or more of its development objectives.

Recommendations

Potential synergies between some of the actions-needed themes identified in this analysis and USAID/Jordan's sectoral development objectives lead to a handful of general recommendations:

- 1) Integrate biodiversity conservation into USAID/Jordan's strategy and program design.
- 2) Use ecosystem services at watershed scale as a framework for integrated programs.
- 3) Build on and replicate successful biodiversity-and-development-integration models already tested.
- 4) Support biodiversity awareness and education.
- 5) Continue support for population, reproductive health, and women's empowerment.

USAID/Jordan should work to integrate biodiversity conservation into its development portfolio as called for in the USAID Biodiversity Policy, both as a way to increase the effectiveness and sustainability of its sectoral development objectives and to allow those sectoral programs to contribute to the actions necessary to conserve biodiversity in Jordan. In making recommendations for future USAID/Jordan programming under a new CDCS framework, we imagine that those programs and activities will be designed to motivate and support the Government of Jordan and its national partners to increase both the capacity and commitment needed to implement and sustain the actions necessary for biodiversity conservation, leading toward national self-reliance in this regard.

Although USAID/Jordan currently supports some actions that enhance biodiversity conservation, they are small. The goal of integrating "biodiversity as an essential element of human development" called for in the USAID Biodiversity Policy requires what it terms "internal change for external impact" – that is, building USAID's own internal capabilities and systems to more effectively integrate biodiversity and development is required. We recommend that USAID/Jordan think through ways to better integrate environment and biodiversity across the Mission's portfolio.

In most of the national documents on water we reviewed, there was a striking gap in information about, and discussions of, hydrology and watersheds, and barely any mention of the relationship between vegetation and hydrology (i.e., ecohydrology). Research has shown that in semi-arid, water-limited ecosystems like those found in much of Jordan, vegetation and soils interact with precipitation, affecting both surface flows and groundwater recharge and flow. Natural vegetation of all kinds provides hydrological services in watersheds. Understanding such "ecohydrological" relationships is therefore essential to water resources development and management.

A growing body of experience from around the world shows that ecosystem services and their management are an entry point for addressing governance issues. Management for ecosystem services often requires decentralized governance. Supporting initiatives in decentralized governance for ecosystem services can be a tool in strengthening governance related to other issues, for improving distributional justice, and for conflict resolution. We believe this represents an opportunity for USAID/Jordan's Democracy, Rights, and Governance program to implement the USAID Biodiversity Policy.

A number of initiatives carried out over the past decade in Jordan, with funding mainly from other international donors, have begun to demonstrate successful models to address the actions needed for integrating biodiversity issues into sustainable, resilient development. USAID/Jordan should evaluate, learn from, and support programs to replicate and expand the lessons learned from these experiences. Pilot and case study experiences with the conservation and governance of ecosystem services in rangelands have been supported by the German development agency GIZ and by IUCN, for example.

Some of this experience comes from experiments with reviving the traditional Bedouin “Hima” grazing system in the Zarqa River Basin and elsewhere. This traditional practice of intensive rotational grazing has shown promising biodiversity benefits in some places. Given that other donors are active in the sector, they have good opportunity to lead and scale up interventions.

Water is a key ecological resource in Jordan because of its scarcity, and its conservation and management are a key to sustainable development. Water can be viewed as an ecosystem service, requiring planning and management at the scale of watersheds. Interesting work on this topic has been done in the area of Wadi Karak, supported by the GIZ Sustainable Use of Ecosystem Services project. An interesting multi-stakeholder planning process in the Karak Governorate led to the Karak Environmental Sustainability Plan, the first strategic plan addressing environmental sustainability at the governorate level in Jordan.

We recommend that USAID/Jordan evaluate, adapt, and replicate some of this experience in its own future integrated conservation and development projects. The piggy-backing on past projects of other donors recommended here suggests the need, opportunity, and benefits of strengthened donor collaboration and coordination on environment and biodiversity, and on integrating conservation and development, in Jordan.

The UNESCO Man and the Biosphere Program coordinates a global network of biosphere reserves, two of which – the Dana and Mujib Biosphere Reserves – are located in Jordan. Biosphere reserves are meant to provide laboratories and models for the development of a sustainable relationship between people and the ecosystems they inhabit. As such, they are natural testing grounds for the vision and objectives expressed by the USAID Biodiversity Policy, USAID/Jordan should consider using them as proving grounds for the integration of conservation and development through its partnership with RSCN.

A number of “actions necessary” identified by this analysis relate to ecological awareness and education. USAID/Jordan could contribute to meeting these needs through future programs in two ways. With its long and important experience in support for public education in Jordan, USAID has the potential to contribute to much-needed national awareness and commitment to biodiversity conservation and environmental sustainability through public school curricula. Second, activities designed to support earlier recommendations for landscape- and watershed-scale ecosystem services and decentralized natural resources governance could be designed with an awareness- and education-oriented communications component that would reach local (municipal and governorate), national, and international audiences.

Jordan’s high birth rates are a long-term driver of the causes of threats to ecosystems, species, and sustainable development. Therefore, USAID/Jordan should continue to support activities in maternal, child, and reproductive health services delivery, and gender-sensitive development, that address this issue. Two potential mechanisms for integrating these health and gender activities into future integrated conservation and development programs are to include population and reproductive health service provision in integrated conservation and development projects, and/or to promote empowerment of women in natural resource-dependent economic activities.

I. INTRODUCTION

I.1 Purpose

In an amendment made to the Foreign Assistance Act of 1961 in 1986 (Section 119), the U.S. Congress imposed mandatory “Country Analysis Requirements” related to the conservation and sustainable use of biological diversity on the U.S. Agency for International Development (USAID, 2017a; USAID, 2017b).

FAA Sec 119 (d) Each country development strategy statement or other country plan prepared by the Agency for International Development shall include an analysis of:

- (1) the actions necessary in that country to conserve biological diversity, and
- (2) the extent to which the actions proposed for support by the Agency meet the needs thus identified.

USAID/Jordan is therefore required to prepare an analysis of biodiversity in Jordan (USAID, 2017b) as a mandatory input in the development of its next Country Development Cooperation Strategy (CDCS), which is expected to cover the period 2020-2025.

It should be noted that the analyses require a general assessment of “actions needed” now, and in the future, and a *prospective* assessment of the “extent to which the actions proposed” for future support by USAID meet the identified needs. It should also be noted that FAA Section 119 does not require Missions to support any actions identified as needed for biodiversity conservation by the analysis. However, by requiring these analyses, Congress clearly acknowledged and recognized the fundamental role that biodiversity plays in sustainable development. These analyses provide an opportunity for USAID missions to better understand the linkages between a country’s development and the conservation of its biodiversity in order to structure effective and sustainable programs.

The analysis presented here aims to provide USAID/Jordan with a menu of opportunities for integrating biodiversity conservation considerations into its new CDCS and development portfolio. It will enable the Mission to:

- 1) Comply with the law.
- 2) Identify and avoid possible development actions that would cause threats to ecosystems and biodiversity.
- 3) Identify opportunities for increasing the effectiveness of the Mission’s development objectives in all sectors (such as economic growth, democracy and governance, and health), and making them more sustainable and resilient, by taking advantage of the benefits of biodiversity to human social and economic development.
- 4) Identify opportunities to incorporate and integrate support for biodiversity conservation in activities of its development sectors.

I.2 Country Development Context

Jordan has a population of approximately 10.2 million people (Population Reference Bureau, 2018), 90 percent of whom live in urban areas. With a population growth rate estimated at 2.1 percent per year, Jordan’s population doubling time is around 33 years, creating a major challenge to any sustainable

development. Thirty-seven percent of the population is under the age of 15 (MWI, 2016). “Much of Jordan’s territory is inhospitable to human settlement. Approximately 90 percent of the country’s population is concentrated in the northwestern quadrant, where rainfall is highest and water is most accessible, making the population density in the inhabited part of the country among the highest in the world.” (USAID, 2017c)

“Jordan’s economy is among the smallest in the Middle East, with insufficient supplies of water, oil, and other natural resources, underlying the government’s heavy reliance on foreign assistance. Other economic challenges for the government include chronic high rates of unemployment and underemployment, budget and current account deficits, and government debt.” (CIA, 2019)

Jordan’s per capita gross domestic product (GDP) is estimated to be about \$9,200. Services account for around 67 percent of the national economy (and 78 percent of the jobs); industry about 29 percent (and 20 percent of jobs); and agriculture contributes around 4 percent (and 2 percent of jobs) (CIA, 2019). As one of the most open economies of the region, Jordan is well integrated with its neighbors through trade, remittances, foreign direct investment, and tourism. The current unemployment rate in Jordan is estimated to be of around 19 percent, according to the Department of Statistics.

Water scarcity is a key challenge facing the country. Jordan’s National Water Strategy 2016-2025 explains that “Jordan is ... classified as being a semi-arid to arid region with annual rainfall of less than 200 mm over 92% of the land. The country comprises 89,297 km², most of which (92%) is desert /rangeland (MWI, 2016, p. 1). The “water sector in Jordan is characterized by severe water scarcity, increasing demand due to high population growth, hosting several fluxes of refugees and economic development needs. Jordan’s renewable water resources are limited and insufficient to meet national demand. There are growing signs of apparent overuse in an increasing number of watersheds and aquifers. Jordan’s annual renewable resources of less than 100m³/capita are far below the global threshold of severe water scarcity of 500m³/capita” (MWI, 2016, p. 8).

Politically, “the Hashemite Kingdom of Jordan is a constitutional monarchy in which significant political power rests with the King and within the central government. The Kingdom is divided into twelve governorates and several smaller political districts comprised primarily of Bedouin tribal groups. Jordan is a highly centralized, unitary state with two levels of sub-national government – governorates and municipalities. The central government provides most basic services, including water, electricity, gas, sewerage, primary education and healthcare” (USAID/Jordan, 2019). Basic services are provided through line ministry directorates at the governorate level. Governorates and municipalities have a limited role in providing public services, few financial resources, and little political power. The approval of the 2015 Decentralization Law and Municipality Law may provide a platform for decentralizing some services and economic and political power (USAID/Jordan, 2019).

“Jordan faces several daunting challenges as it strives to attain its development and reform goals while also taking advantage of potential opportunities such as a young workforce and improving health and education levels. These challenges include a rapidly growing population, gaps in the provision of basic education, high unemployment, weak citizen participation in governance and politics, water scarcity, reliance on expensive imported energy, and gender disparities” (USAID/Jordan, 2019).

USAID’s “Jordan Journey to Self-Reliance: FY 2019 Country Roadmap” (USAID, 2019) rates the country as having a generally lower than average commitment to self-reliant development (five of seven indicators below average), but relatively strong capacity (10 of 10 indicators above average). For the purposes of this analysis, it should be noted that one of the categories under the heading of

“Commitment: Economic Policy” on the Country Roadmap is “Biodiversity and Habitat Protections,” for which Jordan received a score of 0.12 out of 1.0, far below average. This is the lowest score given in any of the categories on the Jordan Country Roadmap, and it is based on the extent of the country’s protected area system. The utility of this metric for assessing Jordan’s commitment to biodiversity conservation is highly questionable, because it does not take into account many of the issues that are most important for conservation of biodiversity and its integration with sustainable development.

“Jordan is an oasis of moderation and stability in a tumultuous region. For this reason and because of the country’s strategic location and long-standing partnership with the United States to advance the Middle East peace process, counter violent extremism, support regional peacekeeping and humanitarian operations, and play a supportive role for Iraqi and Syrian refugees, Jordan has received robust levels of U.S. foreign assistance since 2003” (USAID/Jordan, 2013a, p. 1).

1.3 Summary of USAID/Jordan Programs

Given Jordan’s development context, USAID’s current CDCS is based on the following theory of change, or development hypothesis: *If a healthy and politically active citizenry has been educated and trained to succeed in a private sector and government that diligently pushes for competitive free-market practices and responsible natural resource management, then Jordan will achieve sustainable, inclusive socio-economic development* (USAID/Jordan, 2013a).

USAID is focused on helping Jordan achieve self-reliance by strengthening the rule of law and governance, promoting sustainable economic development, and improving health and education outcomes. The current CDCS covering the period 2013-2019 (USAID/Jordan, 2013a) lists three main Development Objectives (DOs) and one Special Development Objective (SDO): DO1: Broad-based, inclusive economic development accelerated; DO2: Democratic accountability strengthened; DO3: Social sector quality improved; and SDO4: Gender equality and female empowerment enhanced. Programs and activities currently supporting these objectives are summarized in Section 7, Extent to Which USAID/Jordan’s Current Programs are Contributing to Actions Needed.

1.4 Methodology

A Scope of Work (SOW) was developed for the Jordan FAA Section 119 Biodiversity Analysis (Annex A – Scope of Work) that reflected the recommendations of the *Foreign Assistance Act Sections 118/119 Tropical Forest and Biodiversity Analysis: Best Practices Guide* (USAID, 2017a). The FAA Section 119 analysis process began with 27 interviews (Annex B – Persons Interviewed) and site visits in Jordan, conducted from May 12-16, 2019. The team leader at that time was accompanied to interviews and site visits by team members from USAID/Jordan (Annex C – Analysis Team). Thereafter, the analysis was for the most part a desk study conducted by the Senior Technical Advisor/Consultant. Information was obtained mainly from background reports and other documents, including those recommended and provided by USAID/Jordan, and other sources identified through online research. A draft Jordan Biodiversity Analysis report was reviewed by USAID/Jordan, and the Mission’s suggestions were addressed in the final report.

2. STATUS OF BIODIVERSITY

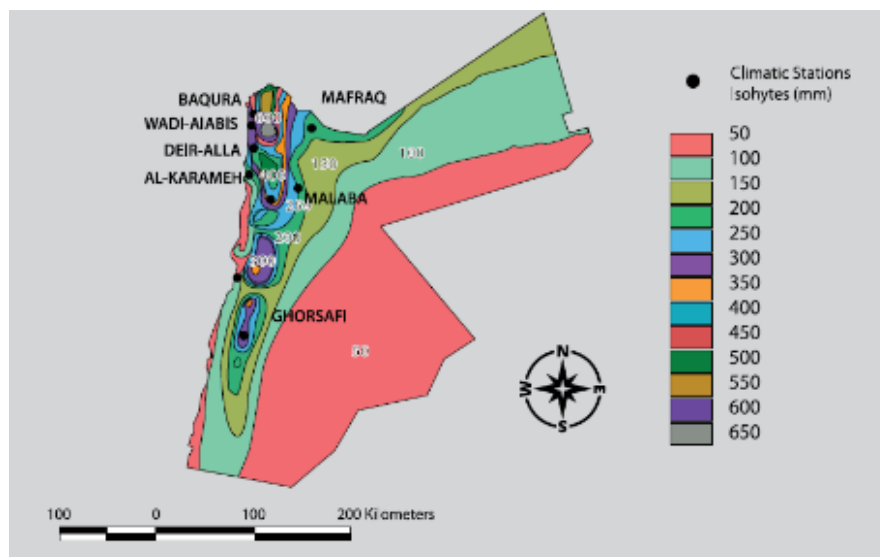
The modern concept of biological diversity, or “biodiversity” for short, encompasses the variety and variability of life at three levels of organization: ecosystems, species, and genes.

This section provides an overview of Jordan’s biodiversity at the ecosystem and species levels. More extensive information on Jordan’s biodiversity can readily be found elsewhere, such as in the *Fifth National Report on the Implementation of the Convention on Biological Diversity* (MoEnv, 2014), and the *National Biodiversity Strategy and Action Plan 2015-2020* (MoEnv, 2015a). This section is meant only to provide context for understanding threats to biodiversity in Jordan and the actions needed to address the causes of those threats, topics that are discussed in detail in later sections of this report.

2.1 Biophysical Setting

Jordan is relatively small country in the Middle East, geographically centered at approximately 31 degrees N latitude and 36 degrees E longitude. It is located in the eastern Mediterranean region, sharing borders with Israel to the west, Syria to the north, Iraq to the east, and Saudi Arabia to the east and south. It has a land territory of 88,800 square kilometers and marine territory of 540 square kilometers in the south, on the Gulf of Aqaba, offshore from its 26-kilometer-long coastline. Jordan’s climate is strongly influenced by its topography. On its western margin, in the Jordan Rift Valley at the Dead Sea, the elevation is more than 400 meters below sea level. A range of mountains, rising steeply from the Rift Valley to elevations of from 500 meters to 1,854 meters, run north-south in the western part of the country. The western highlands have a Mediterranean climate, characterized by hot dry summers, and cool wet winters, with rain occurring mainly between November and April. The highlands slope gently toward the east and the climate becomes arid, creating the eastern desert region of the country. Precipitation varies from more than 600 millimeters (mm) per year at higher elevations in the northwest to less than 50 mm in the eastern deserts.

Figure 1. Rainfall Map of Jordan

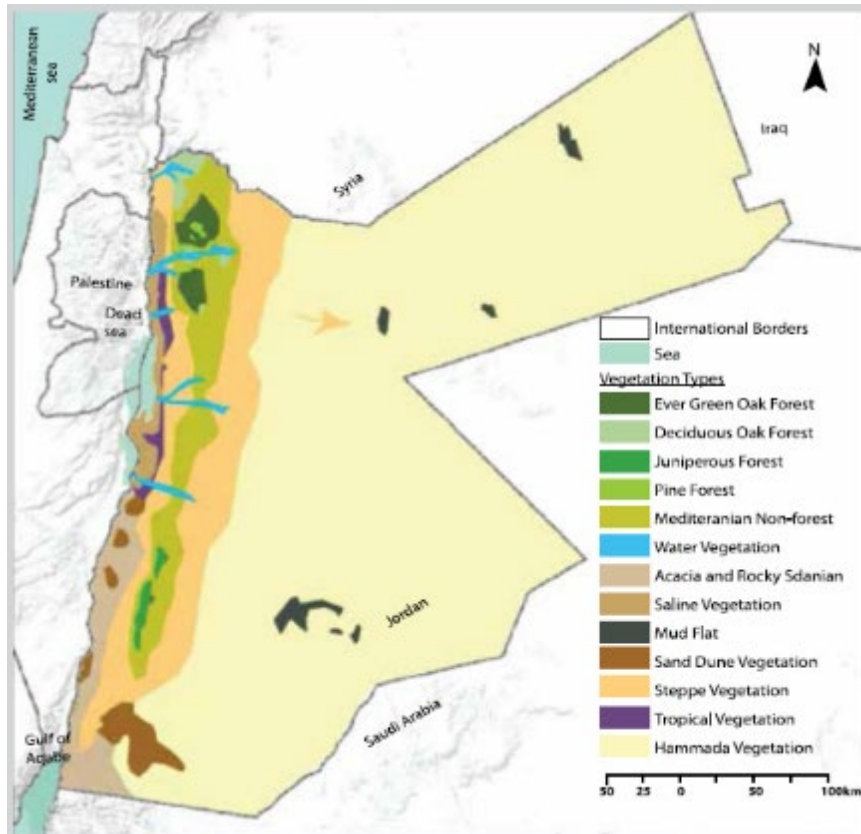


(Source: IUCN, 2015a, p. 10)

2.2 Ecosystems

The topography and climate of Jordan create the conditions for a range of terrestrial ecosystems, shown in Figure 2.

Figure 2. Potential Natural Vegetation of Jordan.

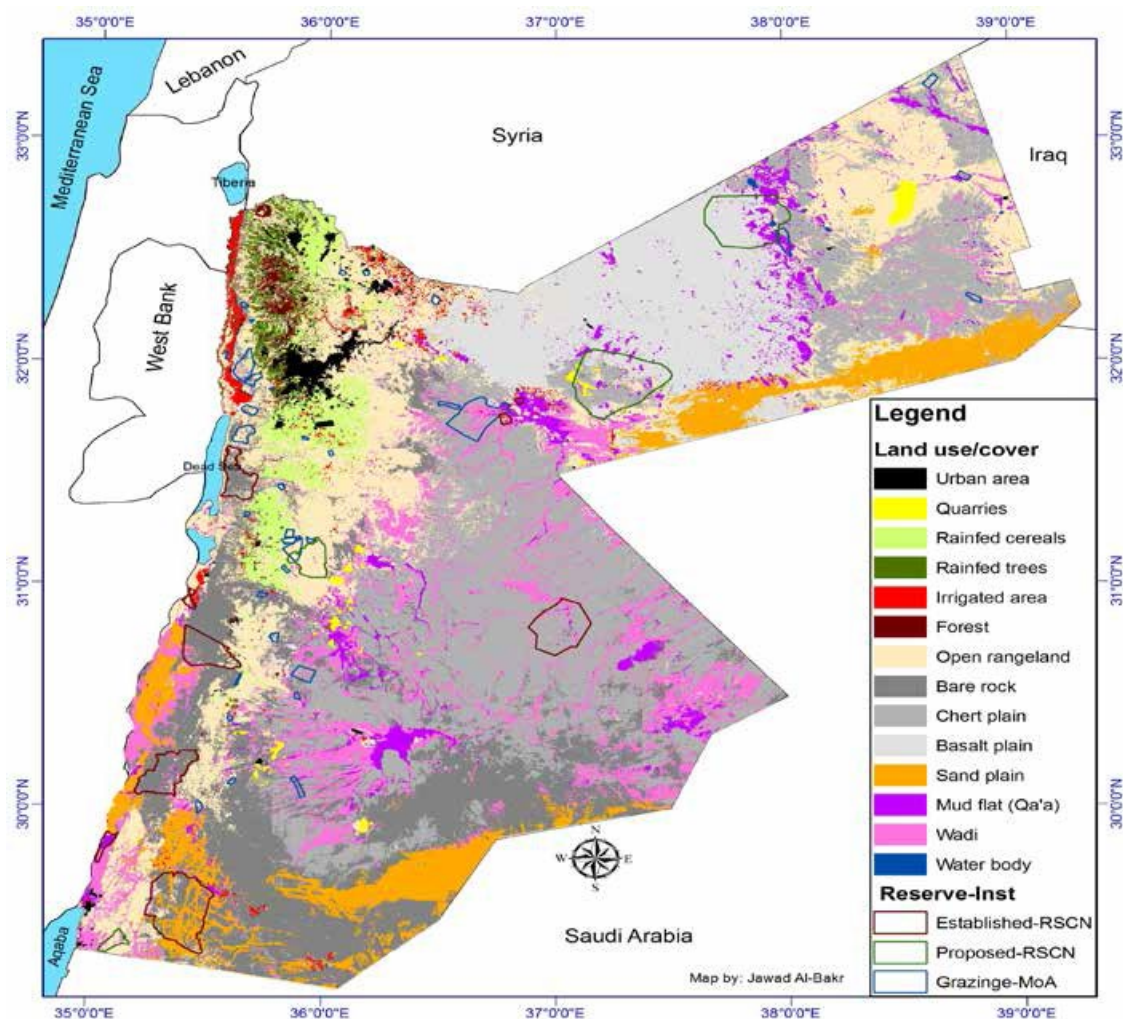


(Source: IUCN, 2015a, p. 16)

Jordan's topographic and climatic diversity, and its location at the intersection of three continents – Africa, Asia, and Europe – have created its diversity of vegetation types over cycles of past climate changes and eons of biogeographic evolution. Plant geographers have described four biogeographic regions in Jordan: Mediterranean, Irano-Turanian, Saharo-Arabian, and Sudanian (MoEnv, 2014, pp. 13-14). Within these zones are various types of ecosystems, as shown on the map of potential natural vegetation in Figure 2. Extensive information on ecosystems and vegetation in Jordan can be found in sources such as the *Fifth National Report to the Convention of Biological Diversity (CBD)* (MoEnv, 2014), *A Toolkit for Mainstreaming Biodiversity in Jordan* (IUCN, 2015a), and *The National Biodiversity Strategy and Action Plan 2015-2020* (MoEnv, 2015a).

The potential natural vegetation shown in Figure 2 no longer exists in most places where it could exist because of habitat loss and conversion from human map activities. A more realistic perspective on Jordan's ecosystems is shown in the land use/land cover map in Figure 3. Note, for example, that the evergreen oak and pine forest ecosystems of the northern highlands have been partly lost to urban development around Amman.

Figure 3. Land Use/Land Cover of Jordan.



(Source: MoEnv, 2015b, p. 25)

2.3 Species

As for its ecosystems, Jordan's species-level biological diversity is described in detail in several recent sources, including the *CBD Fifth National Report* (MoEnv, 2014), *A Toolkit for Mainstreaming Biodiversity in Jordan* (IUCN, 2015a), and *The National Biodiversity Strategy and Action Plan 2015-2020* (MoEnv, 2015a). Jordan's 2,622 species of vascular plants represent 1 percent of the world's flora. One hundred species are endemic, including *Iris nigricans*, the national flower of Jordan (IUCN, 2015a; MoEnv, 2014). Jordan has 644 animal species, of which 83 are mammals, including the globally threatened Nubian ibex (*Capra nubiana*), Arabian oryx (*Oryx leucoryx*), dorcas gazelle (*Gazella dorcus*), goitered gazelle (*Gazella subgutturosa*), and mountain gazelle (*Gazella gazelle*). Jordan has 329 bird species, 10 of which are globally endangered. Jordan's ecosystems support 107 species of reptiles and 3 species of amphibians. The Gulf of Aqaba hosts more than 348 species of fish, 151 species of hard corals, and 120 species of soft corals (MoEnv, 2014).

Figure 4. Arabian oryx (*Oryx leucoryx*)



(Source: RSCN, 2018)

2.4 Agrobiodiversity

This term “agrobiodiversity” has several dimensions:

- Wild edible and medicinal plants
- Wild relatives of cultivated plants
- Diverse landraces, varieties, and cultivars of domesticated species

According to *The State of Jordan's Biodiversity for Food and Agriculture*, “Jordan comprises a sizable part of the Fertile Crescent. It harbors tremendous genetic diversity for flora and fauna due to the highly variable geographical and bio-climatic variability in the country in addition to ancient civilizations” (FAO, 2013a). The mention of “ancient civilizations” refers to the fact that wheat and barley were domesticated in the region.

“Jordan harbors a vast diversity of landraces, old cultivars, wild species and wild relatives of wheat and barley. For example, there is the cultivated durum (*Triticum durum*), the cultivated bread wheat (*Triticum aestivum*), the old wheat (*T. monoccocum*), the wild einkorn (*T. beoticum*), *T. turgidum*, wild relatives [of wheat] (*T. dicoccoides*, *T. Urartu*, and *Aegliops tauschii*), the cultivated two and six-row barley and the landraces old and improved cultivars (*Hordeum vulgare*), and wild barley (*Hordeum spontaneum*). Wild relatives of fruit trees are found in Jordan in the highlands from the north to the south and in the west. These include carob (*Ceratonia siliqua*), jujube (*Ziziphus lotus*), mahaleb cherry (*Prunus mahaleb*), pistachio (*Pistacia* spp.), wild fig (*Ficus palmata*), and olive (*Olea europaea*). These species and genera have adapted to harsh conditions including extremes in temperatures coupled with extended drought and low soil fertility. They are excellent resources for future research [on] ... drought and calcareous soil tolerance” (MoEnv, 2015a, p. 23).

3. VALUES AND BENEFITS OF BIODIVERSITY

Biological diversity provides social and economic benefits of three distinct kinds: ecosystem products, ecosystem services, and non-material benefits. These benefits are an essential foundation of human livelihoods and well-being in every country. Most of these benefits cannot be replaced by human technologies, and are therefore in a sense invaluable (i.e., their value cannot be measured in economic terms).

Biodiversity conservation is of fundamental importance to USAID, given its mission as a development agency. USAID's Biodiversity Policy states that "USAID will promote the use of integrated approaches that support both biodiversity conservation and improved development outcomes," and that "... opportunities to promote integration of biodiversity and development may be best addressed in the context of engagement with specific development sectors, i.e., as they relate to sustaining or increasing access to biodiversity goods and ecosystem services to support development outcomes in those sectors. USAID will pursue opportunities in key sectors such as agriculture, food security ... health, governance, economic growth, and trade" (USAID, 2014, p. 14).

The examples of the different types of benefits presented below were selected because they are important in Jordan, but are meant to be illustrative and not an exhaustive list of all possible examples.

3.1 Ecosystem Products

Ecosystem products are direct material benefits for such things as food, fiber, building materials, medicines, and fuel. Of the many types of products possible, national reports, such as the *Fifth National Report on the Implementation of the Convention of Biological Diversity* (MoEnv, 2014) and the *National Biodiversity Strategy and Action Plan 2015-2020*, emphasize wild edible plants and medicinal plants.

Wild Edible Plants

The National Agricultural Research Centre (NARC) has documented more than 100 edible wild plants that are used by local communities as food or spices, including wild arugula (*Eruca sativa*), dwarf chicory (*Cichorium pumilum*), *Gundelia tournefortii*, asparagus (*Asparagus officinalis*), Persian cyclamen (*Cyclamen persicum*), *Artemisia* spp., and *Thymus* spp. (MoEnv, 2014, p. 23).

Medicinal Plants

Medicinal plants are very important in traditional knowledge systems in Jordan, and extensive research has been done on this topic in the country. Information about medicinal plant uses has been collected from local communities to identify the most important medicinal plants and determine the relative importance of different species to local livelihoods and economies (MoEnv, 2014, p. 23). A total of 47 plant species are used by Bedouin communities for medicinal purposes (MoEnv, 2014, p. 44). "Medicinal plants are widely distributed in Jordan and are massively used by local people in folk medicine as hot or cold syrups, and as chewed fresh or dry raw materials" (MoEnv, 2015a, p. 23).

Marine Fish

A small commercial and sport fishery is based in Aqaba (Al-Zibdah, et al., 2006; Al-Zibdah, 2013). Its management and development have been the subject of research by the Royal Marine Conservation Society of Jordan (JREDS) (Namrouqa, 2017).

3.2 Ecosystem Services

Ecosystem services are best defined as the benefits to humans that result from ecosystem functions and processes, such as:

- Major biogeochemical and nutrient cycles (e.g., of water, carbon, nitrogen, phosphorus);
- Natural pest control by predators in food webs;
- Pollination by insects, bats, and birds;
- Decomposition of biomass, wastes, and pollution;
- Soil formation, retention, erosion prevention, and maintenance of soil fertility; and
- Carbon sequestration and climate regulation.

The diverse species in a given environment interact with each other and the physical environment to create the ecosystem functions and processes listed above. Because biodiversity is the source of ecosystem services, biodiversity conservation is a fundamental requirement for conserving these services. The role of species diversity in maintaining ecological processes and functions is not well understood scientifically, and is an active topic of research. However, studies often show a positive relationship between the number of species in an ecosystem and the level and stability of ecological processes.

Jordan's *National Biodiversity Strategy and Action Plan 2015-2020* points out the value of plant genetic resources (i.e., species and genetic diversity within species): "Many of the plant species in Jordan are adapted to desert areas. Therefore, these species are of extreme importance as a primary vegetation element due to their use as food for humans and animals; and for other uses including: medicinal; soil fixing; nitrogen fixing; as parents of cultivated species; and as disease, drought and saline resistant plants. Plant genetic resources of Jordan are a national and international heritage; therefore, they should be conserved and utilized for the benefit of humanity" (MoEnv, 2015, p. 23). In this statement, they refer both to ecosystem products values (e.g., food for humans and animals, medicines) and ecosystem services values (e.g., soil fixing, nitrogen fixing).

Soil Protection Services

Jordan's largely semi-arid and arid climate, and the ecosystems adapted to those conditions, are susceptible to desertification and soil erosion if overgrazed, or if natural vegetation is replaced by crops on slopes or in erosion-prone areas. Climate change is likely to make them even more fragile. The native plant communities of Jordan are adapted to local conditions, and are generally resilient when not overexploited. Natural, native vegetation in all of Jordan's ecosystems provides irreplaceable services of soil formation, retention, and erosion prevention. An extensive body of research literature supports this idea (FAO, 2013b; Guaquelin, et al., 2019; Mahahrens, 2016).

Hydrological and Watershed Services

In semi-arid, water-limited ecosystems like those found in much of Jordan, vegetation and soils interact with precipitation, affecting both surface flows and groundwater recharge and flow. Understanding such "ecohydrological" relationships (which are often very complex and difficult to study) is therefore essential to water resources development and management (Montaldo et al., 2013, p. 1123). Natural vegetation of all kinds provides hydrological services in watersheds. It slows runoff (thereby reducing soil loss/erosion) and enhances groundwater recharge, thereby generally stabilizing downstream flows (FAO, 2013b; Guaquelin, et al., 2019; Mahahrens, 2016). Healthy, intact rangelands in highland areas of Jordan provide this kind of ecohydrological service, which is decreased as rangelands are overgrazed and

degraded (Mahahrens, 2016). In many parts of the world, in both developed and developing countries, hydrological services in watersheds have provided a platform for “payment for ecosystem services” schemes, whereby downstream water users help to compensate upstream land managers for protecting biodiverse natural ecosystems. Sometimes these schemes involve direct monetary payments; more often, especially in less-developed countries, they have involved some other form of compensation to upper-watershed land managers. Mechanisms for “Payment for Ecosystem Services in Jordan” have been assessed by IUCN-ROWA (IUCN-ROWA, 2019b).

3.3 Non-Material Benefits of Ecosystems

Besides providing direct material benefits to humans in the form of ecosystem products, and indirect material benefits in terms of ecosystem services, natural ecosystems and species also provide a range of non-material benefits that are important to human well-being and development. These include historical, cultural, spiritual, recreational, educational, and scientific benefits. As was the case with medicinal plants among possible ecosystem products, Jordan’s national reports, such as the *CBD Fifth National Report* (MoEnv, 2014) and the *National Biodiversity Strategy and Action Plan 2015-2020*, seem to emphasize tourism among the many possible non-material benefits of biodiversity.

Tourism

The *Fifth National Report* to the CBD states that:

Tourism is of vital importance to the national economy of Jordan. It is the Kingdom’s largest export sector, its second largest private sector employer, and it is second highest producer of foreign exchange. Tourism contributes more than \$800 million to Jordan’s economy and accounts for approximately 10% of the country’s GDP. Today, Jordan is developing parallel the global tourism industry trend by having the highest growth rate in ecotourism, nature based and responsible tourism subsector with an estimated rate of 10% per annum. In addition to the country’s political stability, the geography offered makes Jordan an attractive tourism destination. Jordan’s major tourist activities include ancient places including Petra, its unique desert castles and well preserved natural locations to its cultural and religious sites. Protected Areas have become a substantial proportion of today’s tourism totally more than half a million visitors. Nature based revenues pay for more than one third of the running costs of the protected areas network. The latter two numbers reflect a tremendous positive impact of responsible tourism on the socioeconomic development of local communities and the general public (MoEnv, 2014, p. 23).

Jordan’s National Tourism Strategy 2011-2015 addresses the need to control the negative effects of tourism on biodiversity and ensure sustainability and environmental protection in the tourism sector. The strategy also “addresses ecotourism as one of the important niche markets in the coming years” (MoEnv, 2014, p. 56). The Global Environment Facility and UNDP have funded a project on “Mainstreaming of Biodiversity Conservation in the Tourism Sector Development in Jordan” (2014-2017) with the Ministry of Tourism, RSCN, and local government authorities in three tourism areas: the Dibbeen Forest Reserve, Wadi Rum World Heritage Site, and the Petra Archaeological Park. The Jordan Tourism Board promotes “Eco & Nature” tourism to a number of Jordan’s protected areas (<http://na.visitjordan.com/Whattodo/EcoNature.aspx>).

4. LAWS, POLICIES, AND INSTITUTIONS

This section provides a summary of the legal and institutional context for biodiversity conservation, natural resources management, and environmental protection in Jordan, setting the stage for a discussion of threats, causes, and “actions needed” in later sections of the analysis report.

4.1 Laws and Policies

The Hashemite Kingdom of Jordan is a constitutional monarchy, led by the King, H.M. King Abdullah II. The Constitution was adopted in 1952. It makes no mention of the natural environment, the conservation of biodiversity, or the protection of species. Jordan’s first Environment Law was approved in 1995, and included sections on conserving biodiversity. It has been amended and completely replaced several times since then. The current legal framework for conservation in Jordan rests largely on three laws: the Environmental Protection Law, the Agriculture Law, and the Aqaba Special Economic Zone Law (MoEnv, 2015a). Conservation of biodiversity is a small part of the Environmental Protection Law; much of it deals with pollution control and other environmental issues not directly related to biodiversity. Enforcement of the Environmental Protection Law falls mostly to Jordan’s police. The Agriculture Law includes sections regulating forests and rangelands, fishing, and “the protection of wild birds and wild animals,” including hunting regulations and the protection of endangered species. In practice, the Ministry of Agriculture depends on the RSCN for compliance with hunting regulations and with the Convention on International Trade in Endangered Species (CITES). The Aqaba Special Economic Zone Law set up the Aqaba Special Economic Zone Authority (ASEZA), which has broad autonomy in its region, including for Environmental Impact Assessments and environmental protection and conservation of biodiversity. It is the managing authority not only for the coast of Aqaba, but also the Aqaba Marine Protected Area and the Wadi Rum Protected Area, a World Heritage Site that includes zones for biodiversity conservation.

The *National Biodiversity Strategy and Action Plan 2015-2020* provides a useful summary of the state of environmental governance in Jordan:

Good governance is built on three fundamental pillars, a clear legislative framework, an effective decision making structure and strong culture based on the principles of equity, participation and accountability. In the case of biodiversity in Jordan, the legal frameworks have been significantly improved especially in light of the establishment of the Ministry of Environment (2003) and the adoption of the Environment Protection Law (52) 2006 which enhanced the overall national recognition of the environment protection sector as a whole. The law included provision for two bylaws, namely, the protected areas and national parks, and the environmental impacts assessment bylaws, which were instrumental in the application of the law. Further, the historic role of the Ministry of Agriculture in the protection of forests, rangelands and genetic resources since the establishment of the State of Jordan provided the needed foundation for a successful introduction of the emerging environment legislation. Another positive aspect of the legislative set up is related to the delegation of some of the responsibilities and authorities of the two ministries to the long-established RSCN with regard to the establishment and management of protected areas (by MoEnv) and the enforcement of wildlife protection and hunting regulations (by MoA) (MoEnv, 2015a, p. 38).

Jordan has developed many policies or strategies relevant to the conservation of biodiversity over the past half-dozen years, such as:

- National Biodiversity Strategy and Action Plan 2015-2020 (MoEnv, 2015a)

- Updated Rangeland Strategy for Jordan 2013/2014 (MoA, 2013)
- National Water Strategy 2016-2025 (MWI, 2016)
- The Aligned National Action Plan to Combat Desertification in Jordan 2015-2020 (MoEnv, 2015b)
- The National Climate Change Policy of the Hashemite Kingdom of Jordan 2013-2020 (MoEnv, 2013)
- A National Green Growth Plan for Jordan (MoEnv, 2017)
- Jordan Forestry Policy 2018 (Arabic) (MoA, 2018)
- Karak Environmental Sustainability Plan (2017)

4.2 Government Institutions

Many national government agencies have responsibilities that affect biodiversity conservation. The roles and responsibilities of the most relevant of those are summarized below.

Ministry of Environment (MoEnv)

The Ministry of Environment is the lead ministry for all environmental protection, including for all biodiversity conservation policies and actions. It is legally responsible for managing protected areas, but currently delegates that responsibility to the RSCN, a national NGO. Various directorates within this ministry play roles in biodiversity and natural resources management. The Nature Protection Directorate's Biodiversity Protection Section is charged with protecting and conserving ecosystems, raising public awareness and changing behavior, and partnering with the private sector. This directorate also has a Water Section and a Sustainable Land Use Section. The Licensing and Pollution Protection Directorate within the MoEnv manages Environmental Impact Assessments and issues environmental licenses. The Climate Change Directorate conducts research on climate adaptation and mitigation and leads the development of Jordan's Climate Change Policy and future action plans.

Ministry of Agriculture (MoA)

The Ministry of Agriculture has several units with responsibilities directly relevant to biodiversity and natural resources management. Perhaps the most important of these is the Directorate of Rangelands and Badia Development, which prepared Jordan's most recent national rangelands strategy (MoA, 2013). Its Department of Forestry is, of course, also important. The MoA is responsible for hunting and fishing regulations and for Jordan's participation in CITES, but it delegates both of these duties to the RSCN. It oversees the National Agricultural Research Center (NARC), formerly called NCARE, the National Centre for Agricultural Research and Extension.

Ministry of Water and Irrigation (MWI)

The Ministry of Water and Irrigation is responsible for overall strategic direction and planning in the water sector, in coordination with the Water Authority of Jordan and the Jordan Valley Authority. It prepared the National Water Strategy 2016-2025 (MWI, 2016). Because of the extreme water scarcity the country faces, water is the critical nexus of all social, economic, and political issues that affect agriculture, biodiversity, energy, cities, trade, finance, and national security.

Ministry of Interior (Mol)

The Directorate of Public Security of the Mol, and in particular the Royal Department for Environmental Protection – sometimes called the “Environmental Police” or “Environmental Rangers” – are nominally responsible for enforcement of Jordan's environmental regulations. Those would include regulations

regarding hunting and fishing, protected areas, and international trade in endangered species (i.e., CITES) issues, which have been delegated to the RSCN.

Aqaba Special Economic Zone Authority (ASEZA)

The relatively autonomous ASEZA is responsible for establishing and enforcing its own environmental regulations. It manages the Aqaba Marine Protected Area and associated coastline, and is responsible for development plans for the Wadi Rum Protected Area. Day-to-day management of Wadi Rum is handled by the RSCN.

4.3 National NGOs

Three national non-governmental organizations play important roles in biodiversity conservation in Jordan, as summarized below.

Royal Society for the Conservation of Nature (RSCN)

The RSCN is the leading NGO for terrestrial biodiversity conservation in Jordan. Through delegation from the MoEnv, it is responsible for managing Jordan's terrestrial protected areas, and through delegation from the MoA, for developing and promulgating hunting and fishing regulations and for Jordan's compliance with CITES. Because of its key role in biodiversity conservation in the country, it is invited to contribute to the development of Jordan's biodiversity strategies, plans, and policies.

Royal Marine Conservation Society (JREDS)

The JREDS conducts research and monitoring of the Aqaba Marine Protected Area and coastal environment, advocates for including marine ecosystem services in development planning, facilitates environmental education programs throughout the country, and implements Blue Flag and Green Key programs to indicate environmentally responsible hotels/tourism service organizations.

Royal Botanic Garden

The Royal Botanic Garden is an NGO working to conserve Jordan's native plants. It maintains one of the most important herbaria in Jordan, and in collaboration with the National Agricultural Research Center, maintains seed banks and gardens to conserve native plant species and their genetic diversity. The Royal Botanic Garden also conducts research, operates demonstration restoration sites for native plants, and assists in ecological restoration projects.

4.4 International Agreements

Jordan has ratified a number of international conventions pertaining to the management of natural resources, conservation of biodiversity, and protection of the environment, including:

- Convention on the International Trade in Endangered Species of Wild Flora and Fauna (CITES)
- Jeddah Convention for the Protection of the Red Sea
- United Nations Framework Convention on Climate Change (UNFCCC)
- United Nations Convention on Biological Diversity (CBD)
- Convention on Wetlands of International Importance (Ramsar Convention)
- Paris Agreement to the UNFCCC
- UNESCO Man and the Biosphere Program

4.5 Protected Areas

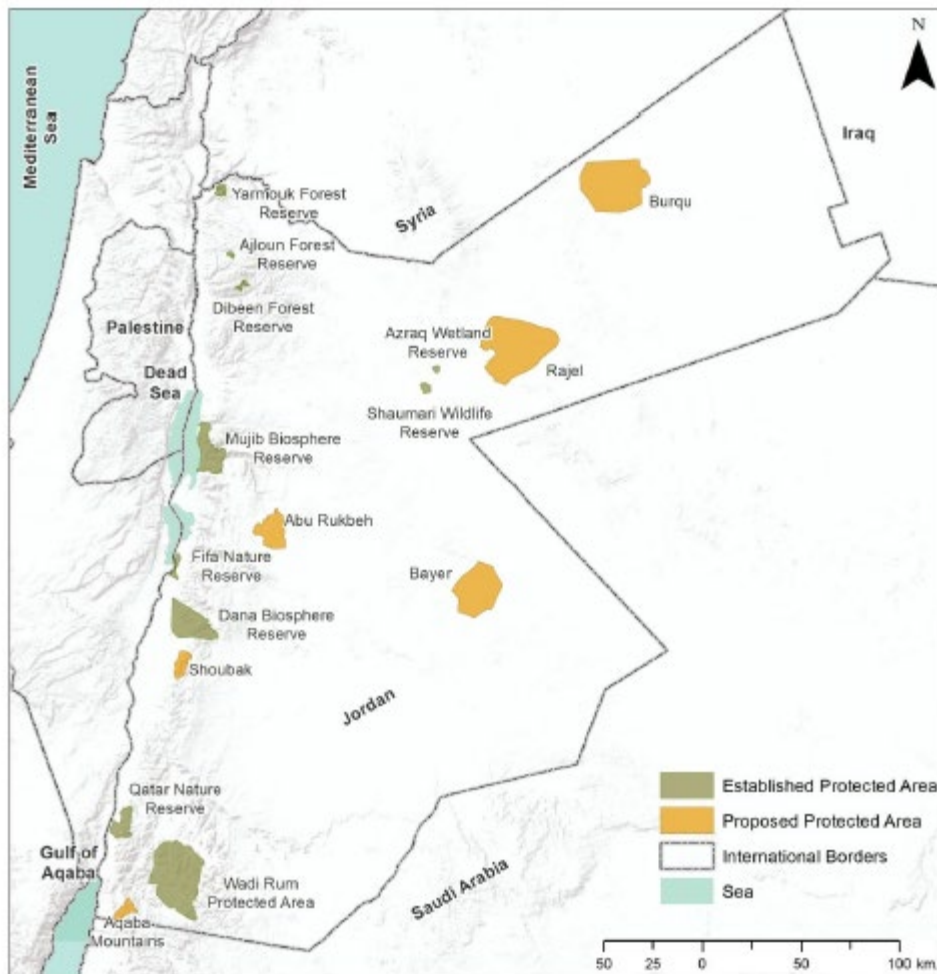
The establishment of areas that protect or sustainably manage natural ecosystems is one of the main strategies for the conservation of biodiversity. The conservation area network is shown in Figure 5, and details are given in Annex D. Jordan currently has approximately 32 protected areas, including 11 main protected areas and 10 Special Conservation Areas of various kinds (MoEnv, 2014, p. 32-33; Protected Planet, 2019). In total, they cover approximately 2,774 square kilometers of land area, or about 3 percent of Jordan, and 33 square kilometers of the Gulf of Aqaba, representing about 36 percent of Jordan's marine territory (Protected Planet, 2019). The government has proposed to establish three new protected areas in 2019 and 2020, and 40 public parks in all governorates in cooperation with the private sector.

Table 1. Major Protected Areas in Jordan (MoEnv, 2015a, p. 32)

Name of PA	Date Established	Area (km ²)*	International Registration
Shoumari Wildlife Reserve	1975	21	
Azraq Wetland Reserve	1978	12	Ramsar
Mujeb Biosphere Reserve	1985	212	UNESCO-MAB
Ajloun Forest Reserve	1987	12	
Dana Biosphere Reserve	1989	292	UNESCO-MAB
Wadi Rum World Heritage Site	1997	729	UNESCO-WH
Aqaba Marine Park	1997	2.5	
Dibbin Forest Reserve	2004	8.5	
Yarmouk Forest Reserve	2010	21	
Qatar Nature Reserve	2011	110	
Fifa Nature Reserve	2011	26	Ramsar

* as reported by MoEnv in Fifth National Report to CBD (MoEnv, 2014, p. 32)

Figure 5. Map of Protected Areas in Jordan



(Source: RSCN, 2014)

(Source: MoEnv, 2014, p. 33)

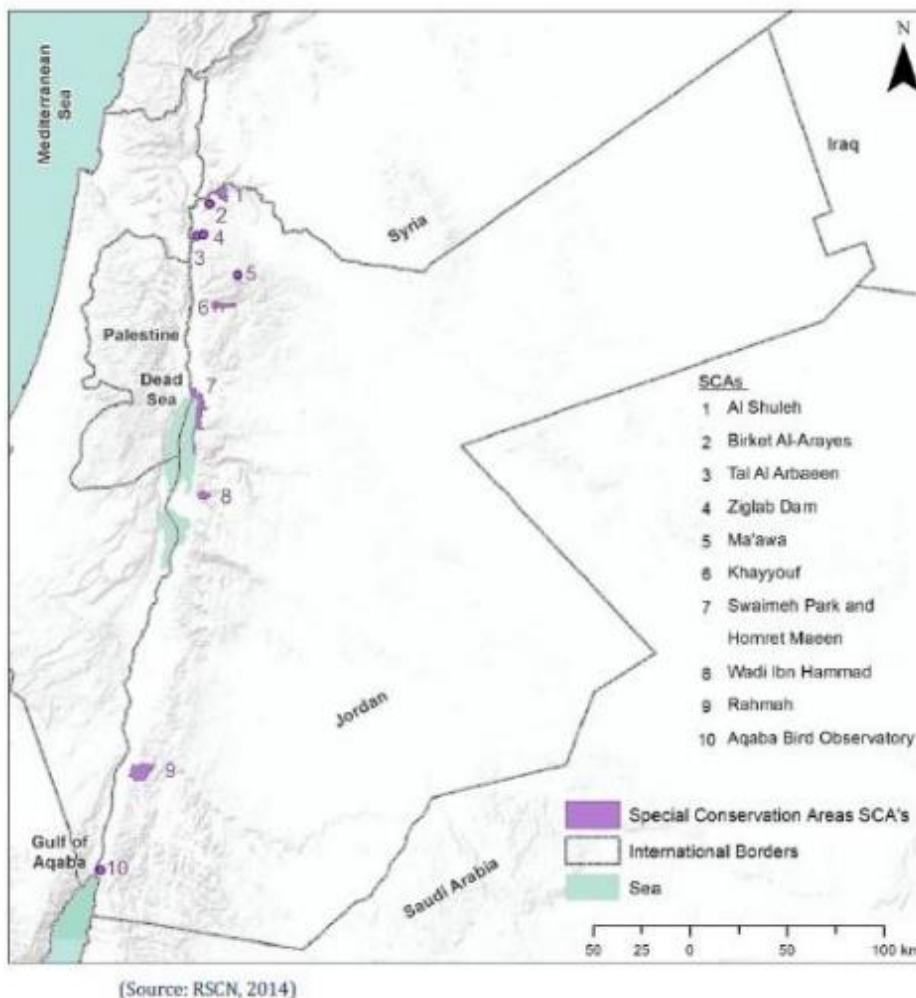
Special Conservation Areas represent an interesting development in the past decade. According to the CBD *Fifth National Report* (MoEnv, 2014):

During the last five years or so, new governance arrangements have arisen in the designation and management of protected areas across Jordan. In addition to the core set of nature reserves established and management by RSCN, other protected areas are being declared by the Ministry of Environment and their management mandates to other government, nongovernment and often community based organizations. These protected areas with their specific governance arrangements include several prime national sites such as Wadi Rum and the Aqaba National Park which are managed by ASEZA, while others represent numerous add-on sites with the primary objective to establish and maintain ecological connectivity between core sites and establish ecological corridors with other non-PA sites, and finally safeguard specific ecological hot spots (often smaller in size and lower in diversity) which were not included in the national system plan. A lot of these new sites are known as Special Conservation Areas. This represents a positive development in the national governance system

of the network, however with many challenges and questions emerging on national integration and management effectiveness (MoEnv, 2014, p. 66).

Figure 6 shows the locations of the Special Conservation Areas. The Protected Planet database reports that five of these areas have local community governance arrangements: Swaimenh and Homret Maeen, Al Khayouf, Wadi Ibn Hammad, Yarmouk River (Shuleh), and Tal Al Arbreen (Protected Planet, 2019). These five Special Conservation Areas could be interesting locations for testing models of decentralized governance of natural resources and biodiversity.

Figure 6. Special Conservation Areas in Jordan)



(Source: MoEnv, 2014, p. 66)

Jordan has two biosphere reserves in the UNESCO Man and the Biosphere (MAB) network, Dana and Mujib. The MAB Program is an intergovernmental initiative to establish sustainable relationships between people and ecosystems across the planet. UNESCO-MAB biosphere reserves serve as laboratories and models for ecologically sustainable development, with an international network of 686 sites in 122 countries. Biosphere reserves are supposed to be laboratories and models for ecologically sustainable development.

Figure 6. Nubian Ibex (*Capra nubiana*) in Mujib Biosphere Reserve



(Source: <http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves/arab-states/jordan/mujib-photo-gallery/>)

The Dana Biosphere Reserve was Jordan's first UNESCO biosphere reserve, declared in 1998. It "includes a system of mountains and wadis (riverbeds in desert areas that remain dry unless it rains heavily) extending from the top of the Eastern Rift Valley to the lowlands of Wadi Araba. The representation of different bio-geographical zones and the dramatic changes in elevation results in a very high biodiversity and a complex set of land cover types. The reserve hosts globally and regionally important species, like the Cyprus warbler (*Sylvia melanothorax*) and the sand fox (*Vulpes rueppelli*) as well as the endemic Syrian serin (*Serinus syriacus*)." The biosphere reserve contains a relict cypress forest (*Cupressus sempervirens*), a rare habitat type in the region. Mixed Bedouin tribes of about 500 people live within the biosphere reserve boundaries (1998), while the population reaches some 20,000 people in the immediate hinterland of the biosphere reserve. Major human impacts include overgrazing, firewood collection, water pollution and collection, tourism, hunting, etc. The management activities have focused on the reduction of these impacts through control of grazing, hunting, tree cutting, and access for tourists mainly through zoning and ranger patrols. Dana is considered a regional model for its pioneering work in integrating nature conservation with the socio-economic development of local communities. The reserve's vegetation includes Mediterranean semi-arid forest with oak (*Quercus calliprinos*), juniper (*Juniperus phoenicia*), and wild pistachio (*Pistachio atlantica*); mid-altitude steppe; arid *Acacia*-dominated sub-tropical shrublands; and sand-dune desert (UNESCO-MAB, 2019a).

The Mujib Biosphere Reserve, Jordan's second, was declared in 2011. It is managed by the RSCN, and located in the central highlands of the southern part of Jordan Valley. The reserve includes a system of mountains and wadis extending steeply from the Rift Valley escarpment to the Dead Sea. A small number of Bedouin live permanently in the area. The main economy for these inhabitants is livestock raising. The other communities living in the reserve and using it for grazing are residents of the surrounding villages, with a total population of about 14,000 people (UNESCO-MAB, 2019b).

Figure 7. Wadi Mujib Canyon



(Source: <http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves/arab-states/jordan/mujib-photo-gallery/>)

5. THREATS, CAUSES, AND DRIVERS

5.1 Threats to Biodiversity

The threats-based approach to biodiversity conservation that guides USAID’s biodiversity programming was used as the conceptual framework for this analysis (USAID, 2005; 2014; 2017a). We first identified the direct biophysical threats to biodiversity in Jordan, organized under the five main categories recognized by the Convention on Biological Diversity (CBD, 2006) and USAID (USAID, 2014):

- Conversion, loss, degradation, and fragmentation of natural habitats
- Overharvesting or overexploitation of particular species
- Pollution or contamination that harms natural habitats or species
- Invasive (usually non-native) species that harm natural habitats or native species
- Climate change (or other macro-environmental changes such as ocean acidification)

Climate change is a potential threat of unknown magnitude; it may accentuate other direct threats, especially habitat loss, degradation, and fragmentation, and threats from invasive species. In some ways, it falls into a gray area between cause and threat, being itself a potential cause of some of the other direct biophysical threats to ecosystems and species.

Table 2. Examples of Threats to Biodiversity in Jordan

Threat by Category (Illustrative Examples)
<p>Habitat Loss/Degradation</p> <ul style="list-style-type: none"> • Habitat loss from urban expansion (MoEnv, 2014, p. 34, and p. 36) • Habitat degradation from increased grazing and agriculture by local populations attracted to tourism development sites because of economic opportunities (MoEnv, 2014, p. 35) • “Overgrazing and extensive woodcutting, in addition to intensive agricultural practices, are major threats to wildlife in Jordan as they result in soil erosion and destruction of natural habitats” (MoEnv, 2014, p. 35) • “Unbalanced water use and unplanned water extraction from surface and underground water resources threaten many areas of Jordan and consequently, the habitats and micro ecosystems of both animals and plants” (MoEnv, 2014, p. 35) • Threats to forests: urbanization, fire (MoEnv, 2018, p. 266) • Soil erosion/loss from agricultural practices (non-contour plowing by smallholder farmers for annual crops) (MoEnv, 2015b, p. 26) • Agricultural expansion on marginal lands: “... crop cultivation and grazing in areas of higher risk (steeper slopes and/or lower rainfall and in particular in the marginal and steppe areas).” (MoEnv, 2015b, p. 26) • Salinization of soil in the Jordan Valley (MoEnv, 2016, p. 46) • “Unplanned mining” (MoEnv, 2014, p. 36) • “Jordan’s renewable water resources are limited and insufficient to meet national demand. There are growing signs of apparent overuse in an increasing number of watersheds and aquifers” (MWI, 2016, p. 8)
<p>Overexploitation</p> <ul style="list-style-type: none"> • Illegal hunting has caused the extinction of several species of Jordanian wildlife, and is

Threat by Category (Illustrative Examples)

considered to be one of the main factors threatening faunal biodiversity in the country (MoEnv, 2014, p. 36)

- “Many plants are under collection pressure to be used for domestic use and grazing, or for housing and industrial projects (such as projects that package and market wild and medicinal plants) (MoEnv, 2014, p. 29)
- Threats to forests: “woodcutting” (MoEnv, 2018, p. 266) and firewood collection (Addison, 2008; 2011)

Invasive Species

- “Introduction of alien species is a major threat to native animal and plant species” (MoEnv, 2014, p. 37)
- Examples of invasives: “*Cyperus rotundus* (sedge), *Cyprinus carpio* (fish), *Eichhornia crassipes* (aquatic plant), *Imperata cylindrica* (grass), *Myocastor coypus* (mammal), *Prosopis spp.* (tree, shrub) (IUCN: The Global Invasive Species Database 2013 <http://www.issg.org/>).

Pollution

- “Pollution of surface and underground water resources and aquifers due to agro-chemicals, sewage discharge...” (MoEnv, 2014. P. 36)

Climate Change

- “Jordan is vulnerable to climate change, and some features of projected climate change in Jordan include: i) increase in temperature of 1-2 degrees centigrade by 2030-2050; ii) increase in evaporation accompanied by soil moisture reduction; iii) diminished recharge of aquifers and oases, iv) projected shrinkage of grasslands (which extend over 10% of Jordan); and v) projected shift of semi-arid rangeland (which extend over 80% of Jordan) to become arid desert” (MoEnv, 2014, p. 36)
- Increase in temperature, decrease in precipitation threatens vegetation and water supply (USAID, 2017c)

5.2 Causes of Threats

The direct biophysical threats to biodiversity in Jordan have many specific, proximate causes, and those have deeper, more systemic “root causes” or “drivers.” The next step in this analysis was to identify and describe the main causes and drivers of those direct biophysical threats. Causes generally fall into one of three categories: 1) political, institutional, or governance-related; 2) economic; or 3) social (related to, for example, cultural beliefs, lack of awareness, information, science, or technology). They can range from deep, systemic factors – which are sometimes also called “drivers,” “constraints,” or “root causes” – to more specific, immediate, local factors, which are sometimes also called “indirect threats” or “proximate causes” (USAID, 2005; 2014; 2017a).

The use of the terms “causes” and “drivers” in the literature on biodiversity conservation is not standardized and can be confusing. Reports from the Convention on Biological Diversity (CBD) use both terms, equating the term “driver” with “underlying cause” (CBD, 2011, 2014), “root cause,” or “indirect driver” (CBD 2010). The USAID Biodiversity Policy defines “driver” as “the ultimate social, economic, political, institutional, or cultural factor that enables or exacerbates one or more threats” (USAID, 2014). According to this definition, the term “driver” should be reserved for very broad root causes. This usage accords with that of the Convention on Biological Diversity (CBD, 2010) and earlier USAID guidance on FAA 118-119 analyses (USAID, 2005), which list drivers such as:

- Demographic change (rapid population growth, migration, and flows of refugees)
- Poverty, lack of access to resources necessary for subsistence
- Inequitable economic policies and structures

- Illegality and corruption
- Global market forces
- Insecure land and natural resource tenure

More simple, proximate causes, such as overgrazing, do not rise to that level or scale, so using the term “cause” or “proximate cause” for these makes sense. The simple and direct word “cause” is probably preferable except for those deep “enabling conditions” that themselves underlie suites of causes.

An example may help to clarify this issue. Some of the threats to biodiversity and forests in Jordan, such as overgrazing of rangelands, farming on marginal lands, and unsustainable woodcutting, stem from proximate causes rooted in rapid population growth (caused both by high birthrates and flows of refugees from unstable neighboring countries). Although it may be true that addressing the drivers and reforming the system is a more sustainable, long-term method of addressing most threats (USAID, 2017a), the phrase “long-term” is key here. It suggests that the scale and complexity of addressing a deep underlying cause such as refugee flows from regional conflicts can take a long time. In Jordan, for example, if immediate, shorter-term actions did not address the proximate causes of overgrazing, soil erosion, and forest loss, ecological tipping-points might be reached before the underlying drivers of the problems were controlled.

It is therefore important to distinguish between immediate or proximate causes of a specific threat and the deeper underlying conditions that may contextualize or enable the immediate cause, because the actions necessary to address proximate causes and drivers are usually at very different scales or levels of complexity. Any conservation planning must take these differences into account – so careful use of terms like “cause” and “driver” is important.

Using this logical framework of threats and causes (or drivers), the actions needed to address, reduce, and/or remove the causes – and thereby reduce the direct threats themselves – can be determined (USAID, 2005; 2017a).

In several key biodiversity documents from the Government of Jordan, such as the *CBD Fifth National Report* (MoEnv, 2014) and the *National Biodiversity Strategy and Action Plan 2015-2020*, the logic of threats, causes, and actions needed is confused, mixing threats, causes, and drivers without discrimination. For example: “In 2014, the biodiversity of Jordan still faces many challenges and constraints including the continuation of habitat destruction as a result of uncontrolled urban expansion, overgrazing, excessive woodcutting, unplanned mining, and unbalanced water use, in addition to wildlife persecution, alien and exotic species invasion, inadequate tourism development, and the more recent challenge of refugees who have fled to the country as a result of regional political instabilities.”

Table 3. Causes of Threats to Biodiversity in Jordan

Proximate Cause (Illustrative Examples)
Political, Institutional, Governance-Related <ul style="list-style-type: none"> • Weak enforcement of laws (MoEnv, 2014, p. 37) • “... Sensitive regional political conditions” (MoEnv, 2014, p. 37) • “Chronic weak enforcement of laws remains a perennial issue for biodiversity in particular. The problem of enforcement is mainly related to the ineffective application of the bylaws and regulations by the juridical systems” (MoEnv, 2015a, p. 38)

Proximate Cause (Illustrative Examples)

- "... The decision structures related to biodiversity have been poorly established until recently. Public participation including civil society, local communities and private sectors remains below accepted standards ..." (MoEnv, 2015a, p. 38)
- "Disconnect between Scientific-base and Development Agendas" (MoEnv, 2015a, p. 38)
- "Development of hotels and other tourism infrastructure in ecologically sensitive areas leading to fragmentation and loss of habitat" (MoEnv, 2014, p. 35)
- Direct tourist visitor impact on vegetation from trampling, off-trail trekking, etc. (MoEnv, 2014, p. 35)
- Increased use of water for tourist infrastructure (MoEnv, 2014, p. 35)
- "Land Tenure in Jordan. Among the many other factors affecting desertification in Jordan, it is believed that land tenure system is one of the major elements leading to land degradation especially in the Badia region." Designation of "...grazing rangelands as state-owned properties (common property) and the elimination of traditional land tenure systems accelerated the destruction of the rangelands" (MoEnv, 2015b, p. 28)
- "Uncontrolled vehicle movement has led to habitat destruction and has caused disturbance to breeding grounds of migratory species, decreasing successful breeding and number of migratory birds visiting Jordan" (IUCN, 2015)
- "The existing land tenure system is considered as one of the reasons for a long conflict between pastoral groups from the local communities and the administration of laws. In addition to the above, the destruction of natural vegetation in the steppe and desert rangelands and failure to enforce existing laws has encouraged the cultivation of most productive rangelands, resulting in desertification" (IUCN, 2015)
- "Urban development and poor environmental planning; individual project authorizations and licensing is done through EIA's that are administered by MoEnv without a holistic approach to development or strategic environmental assessments at a national level." (source: key informant opinion)

Economic

- Lack of adequate financing for biodiversity conservation is discussed in the NBSAP (MoEnv, 2015a, p. 39)

Socio-Cultural

- Lack of public awareness on biodiversity: "... biodiversity is not sufficiently recognized by the Jordanian public including policy and decision-makers all the way to end users. ... The general public in Jordan is not aware of the importance of biodiversity for our lives and future." (MoEnv, 2015a, p. 37)

5.3 Drivers and Root Causes

Population growth and refugees (contributing to population growth) could be considered drivers of the more proximate causes of threats to biodiversity (MoEnv, 2014, pp. 37-38; MoEnv, 2015a, p. 36). Demographic pressure that causes land degradation and leads toward desertification is discussed in the *Aligned National Action Plan to Combat Desertification in Jordan 2015-2020* (MoEnv, 2015b, 27).

The *National Biodiversity Strategy and Action Plan* (MoEnv, 2015a, pp. 37-39) lists a series of what it calls "underlying causes" and "root causes," including:

- Lack of public awareness on biodiversity (p. 37)

- Weak governance: “The decision structures related to biodiversity have been poorly established until recently. Public participation including civil society, local communities and private sectors remains below accepted standards.” (p. 38)
- Lack of a systematic financing framework: “Lack of adequate and sustainable financing is a global constraint facing the sustainable development agendas in general and biodiversity conservation in particular. The level of national government investment of Jordan on biodiversity was less than 0.05% of the GDP in 2013.”

“An Evaluation of the Effectiveness of Environment Policy in Jordan” done in 2016 posits that corruption is a root cause of ecological threats, and states that “Large industries and monopolies owned or managed by influential persons or groups do not comply or only partially comply with regulations,” and that “Corruption should be confronted firmly by the government” (Shamaileh, 2016, pp. 112-113).

Regional instability and conflict is clearly another long-term driver of many of the proximate causes of the direct threats to biodiversity in Jordan.

6. ACTIONS NEEDED TO CONSERVE BIODIVERSITY

The language of FAA Section 119 calls for analysis to identify the actions necessary in that country to conserve biological diversity. These “actions necessary” will address and reduce the causes of threats to biodiversity, as discussed in Section 5 of this report. Such actions include, in general, those that address the political, institutional, and governance causes; the economic causes; and the social causes.

6.1 Actions Needed According to the Government of Jordan

Jordan’s official view of what actions are necessary to conserve the ecosystems, species, and ecosystem services in Jordan are documented in a number of national reports produced within the past five years. These were reviewed, and their key conclusions are listed below. Each of the bullet points for a given source represents an “action necessary” to conserve Jordan’s biodiversity and natural environment.

Fifth National Report to the Convention on Biological Diversity (Ministry of Environment, 2014)

- Integrate biodiversity and ecosystem services considerations into land use strategies and plans: “The above ongoing and often accelerating challenges reinforce the need for improved land use planning and management capacity. A national land use plan was a clear focus of several national policies and strategies since the 1991 National Environment Strategy (1991). All successive strategies continued to address such a need, however, with little detail on ways of specifically integrating biodiversity conservation into broader land use strategies” (MoEnv, 2014, p. 34) [exactly the same quote from MoEnv, 2015a, pp. 32-33].
- Develop mechanisms to account for the value of biodiversity and ecosystem services (inside and outside of protected areas) to development in Jordan. “In general terms it is important to note that the figures generated in this report only represent a partial value of the ecosystems. Using the values in this report, a more detailed valuation of some of the other protected areas (all forms) remains needed, mainly to highlight the ecosystem functions provided by these areas and their association with local livelihoods and human wellbeing” (MoEnv, 2014, p. 39).
- “The conservation and sustainable use of the important medicinal plants in the Mujib Nature Reserve requires strict regulations for both the grazing and the collection of these plants” (MoEnv, 2014, p. 43).

National Biodiversity Strategy and Action Plan 2015-2020 (Ministry of Environment, 2015a)

- Need “awareness” of the value of biodiversity and “improved public participation in the environmental processes and decision-making frameworks would yield better national understanding and more ownership and thus stronger support to biodiversity conservation and environmental sustainability” (MoEnv, 2015a, p. 37).
- “For an adequate level of decision support to be provided by the various specialized scientific entities concerned with biodiversity, a set of supportive legal instruments needs to be put in place, supported by adequate levels of technical and logistical capacities of such institutions, also coupled with clear lines of separation of duties and lines of authority” (MoEnv, 2015a, p. 38).

Sixth National Report to the Convention on Biological Diversity (Ministry of Environment, 2018)

- Raise awareness of the need for biodiversity conservation among national decision-makers and the public.
- Integrate safeguards for biodiversity in tourism development plans, and raise the profile of nature-based tourism and awareness of its contribution to economic development.

- Incorporate biodiversity values in national accounting systems.
- Carry out a comprehensive national forest inventory to assess the current area and condition of all forest types in Jordan, develop an ecosystem-based approach for conserving and managing forests, and conduct a comprehensive review of the legal mechanisms available for forest protection.
- Develop a comprehensive national rangeland strategy.
- Develop biodiversity safeguards for the mining sector.
- Develop an integrated coastal zone management for Aqaba that ensures the protection of coastal and marine biodiversity.
- Assess the status of key game species, and review and update current regulations to conserve their populations. Conduct a hunter awareness program regarding the regulations (MoEnv, 2018, p. 16).
- Strengthen national capacities for climate change adaptation and its linkages with biodiversity conservation, including ecosystem-based approaches to adaptation (p. 20).
- Increase the area of terrestrial protected areas to at least 2% of national land territory and marine protected areas to 10% of national marine territory (p. 22).
- Conduct a national assessment of ecosystem services and strengthen national awareness of ecosystem services values and benefits among all relevant stakeholders (p. 24).
- Review basic education curricula on biodiversity and pilot capacity-building programs for school teachers on nature education (p. 25).
- Develop and institutionalize national strategies for the conservation and use of genetic resources (p. 28).
- Develop tourism protocols and business plans that ensure nature protection to enable sustainable nature-based tourism (p. 31).

National Action Plan to Combat Desertification (Ministry of Environment, 2015b)

- Revive the “Hima” system of rangeland management (MoEnv, 2015b, p. 31).
- Promote sustainable land use practices in agriculture and grazing. For list, see p. 31 in Desertification Strategy (MoEnv, 2015b, p. 31).
- Promote conservation agriculture that will prevent soil erosion, restore and improve soil fertility, increase soil organic matter, and conserve water through minimum tillage, improved fallowing, mulching, green and animal manures, minimum tillage, terraces, and contour tillage.
- Conserve all remaining forests, and active regeneration and restoration of former forest areas, especially on steep slopes, upper watershed catchments, and other fragile or erodible areas.
- Improve water capture, management, and conservation in urban, agricultural, forest, and rangeland areas, to maintain stream flows, springs, and groundwater recharge.
- Restore community-based rangeland governance and management practices, including maintaining or restoring rotational and seasonal grazing patterns and improving the management and health of ruminant animals.
- Improve livelihoods through sustainable natural resource use, including business-oriented organic farming in rainfed agricultural areas, livestock and dairy products, and wild natural products (e.g. honey, herbs, and medicinal plants).

Updated National Rangeland Strategy 2013-2014 (Ministry of Agriculture, 2013)

- Improve and develop rangelands through water harvesting, rangeland restoration (e.g., reseeding important forage species) and regulating the exploitation of pastures.
- Maintain and monitor the ecological conditions and livestock productivity in the network of rangeland reserves established by MoA to protect and manage rangeland plant species and conserve rangeland ecosystems (p. 11).

- Reduce overgrazing and rangeland deterioration.
- Improve economic conditions in rangeland communities and involve women in economic activities.
- Strengthen awareness and technical extension programs in rangeland communities (all from MoA, 2013, p. 23).
- Promote community management to restore rangelands (p. 24).

National Green Growth Plan (Ministry of Environment, 2017)

- Redress market failures by valuing ecosystem services. “Green growth seeks to redress these market failures by valuing ecosystem services” (MoEnv, 2017, p. 17.)
- Combat desertification to maintain rangeland ecosystem services (MoEnv, 2017, p. 21).

Jordan’s State of Environment Second Report (Ministry of Environment, 2016)

- Better implementation of land-use planning and zoning, enforcement of bylaws to prevent urban expansion onto agricultural and forest land (MoEnv, 2016, p. 46).
- “Strengthen the role of the National Committee for Combating Desertification as a mechanism to coordinate governmental, non-governmental, and private-sector institutions and stakeholders” (MoEnv, 2016, p. 48).
- Regulate and enforce quarrying and mining, especially in areas of environmental and touristic importance and of natural vegetation (MoEnv, 2016, p. 49).
- Expand the processes of afforestation and soil protection in areas threatened by soil erosion (MoEnv, 2016, p. 49).

National Water Strategy 2016-2025 (Ministry of Water and Irrigation, 2016)

- “Healthy aquatic ecosystems are vital to a high quality of life for Jordanians and must be preserved in pursuing socioeconomic and community-level development” (Principle listed in MWI, 2016, p. 3)
- “Citizens and the private and public sectors must share responsibility for water management and protection and work together to improve conditions within their local watersheds” (Principle listed in MWI, 2016, p. 3).
- “Conserve and restore watersheds” (MWI, 2016, p. 30)
- Build national technical capacity in hydrology and ecology, including ecohydrology. “There is a great need for technical expertise in sector management including monitoring and evaluation, data management and analysis; engineering and applied sciences including hydrology and ecology” (MWI, 2016, p. 51).

National Climate Change Policy 2013-2020 (Ministry of Environment, 2013)

- Introduce and strengthen ecosystem-based adaptation to climate change. “Ecosystem-based adaptation provides a cost-effective strategy that can be undertaken by parties, and is especially effective at local levels with community involvement. Ecosystem-based adaptation may also contribute to climate change mitigation through the preservation or sequestration of carbon (MoEnv, 2013, p. 29).

6.2 Actions Needed from Other Sources

Key informants interviewed by the analysis team (Appendix B – Persons Interviewed) proposed the following “actions necessary”:

- Strengthen communication and coordination between the MoEnv and ASEZA, which is now weak and inadequate.

- Improve rangeland management for sustainability and resilience.
- Increase national capacity to implement CITES obligations.
- Raise the profile of, and strengthen communication and coordination among, biodiversity conservation and environmental CSOs/NGOs.
- Improve environmental and biodiversity education in formal and non-formal education systems.
- Support the institutionalization of the National Biodiversity Committee and strengthen its role as a technical arm to the MoEnv.
- Strengthen, and give more independence to, the Ministry of Environment.
- Improve urban environmental planning by developing large-scale strategies and master plans that will provide more control over individual project authorizations and licensing.
- Develop mechanisms for environmental protection and biodiversity conservation outside of protected areas. One key informant stated “There is a tragedy going on outside of protected areas.” MoEnv and RSCN are not able to protect anything that is outside PAs, “there are no means to do so.”

A review of relevant documents and project descriptions (including those from USAID) were obtained through online research. They also identified some important needs for biodiversity conservation and natural resources management in Jordan, including:

- Formally position integrated water resources planning and management into all government institutions and sectors (USAID-LandLinks, 2018).
- Clearly, effectively, and practically integrate and implement forest development and preservation into national and local development plans and strategies (USAID-LandLinks, 2018).
- Mitigate land degradation and enhance rangeland development and improvement (USAID-LandLinks, 2018).
- Support women’s role[s] as managers, users, and beneficiaries of land and natural resources (USAID-LandLinks, 2018).
- Promote regional water cooperation: “Water resource development and management and access to freshwater is highly asymmetric between Jordan, Israel and the Palestinian territories and several of the water provisions in a 1994 Treaty between Israel to Jordan have not yet been implemented” (USAID-LandLinks, 2018).
- Create national policies that take the conservation of biodiversity and the ecosystem services it creates seriously. Jordanian policies “have not led yet to the sustainable use of ecosystems or to sufficient attention being paid to ecosystem services... Decisions on new infrastructure projects, land use or state investments do not take the importance of biodiversity and ecosystem services into consideration” (GIZ, 2019).
- “Mainstream” biodiversity and ecosystem services considerations into national development planning and decision-making, in order to achieve sustainable development, self-reliance, and resilience in the face of climate change (GIZ, 2019).
- Emphasize community-based, integrated water management: “The multi-faceted character of Jordan’s water crisis requires an integrated response: one that coordinates across actors – government, donors, and NGOs – to address immediate problems.” “The Government of Jordan should engage key local stakeholders – municipal governments, CBOs, and tribes – in the management of communal water resources” (Mercy Corps, 2014, p. 38 and p. 39).
- Include environmental education in school curricula: “The influence of school education for raising environmental awareness is [an] untouched topic” (Flinzberger, 2018b, p. 66).
- Use ecosystem services management as the entry point to tackle governance, distributional justice, and conflict resolution at the governorate and municipality level (Flinzberger, 2018b, p. 67).

- Expand economic and decentralized governance approaches to conservation and environmental management and rely less on top-down, command-and-control approaches. “Jordan’s environmental policy relies solely on the command and control approach to mitigate negative externalities, while completely overlooking price-based and rights-based instruments. ... Results [of this study] may motivate government regulators to endorse price-based and rights-based measures, in addition to command and control measures” (Shamaileh, 2016, p. 98).
- Harmonize the legal responsibilities of the MoA, MoEnv, and MWI (Shamaileh, 2016, p. 113).
- Reduce birth rates and refugee flows to lower demand on natural resources.

6.3 Actions Needed from USAID/Jordan in 2010 and 2013

As mentioned in Section I, Introduction, USAID/Jordan developed biodiversity assessments in 2006, 2010, and 2013 (USAID/Jordan, 2006; 2010; 2013b) as inputs to their CDCS process. The lists of “actions needed” given in the 2010 and 2013 documents are identical, and are copied here:

1. Establish an effective legal and regulatory framework for environmental management and clarify overlapping institutional mandates, authorities, and arrangements.
2. Establish an effective network of protected areas to safeguard a representative sample of major and key ecosystems.
3. Build environmental management capacity and foster integrated land-use planning.
4. Promote public awareness and expand environmental education.
5. Promote investment in ecotourism development as a growing engine of economic development with focus in and around conservation hot spots while linking it to sustainable local livelihoods development.
6. Promote improved governance types of natural resource management with particular focus on local communities' empowerment and participation with equitable benefit sharing.
7. Support the completion and maintenance of the national Protected Area network within the principles of ecosystem management.
8. Prevent overgrazing by livestock and improve range management.
9. Strengthen law enforcement to reduce illegal hunting, trade in endangered species, and other wildlife crime.
10. Stop illegal woodcutting and encroachment of urban settlement into woodlands through technical and hardware assistance support of the law enforcement body represented by the MoEnv staff and the Royal [Environmental] Rangers.
11. Assist in capacity-building of the new MoEnv and other associated national civil society organizations.

7. EXTENT TO WHICH USAID/JORDAN'S CURRENT PROGRAMS ARE CONTRIBUTING TO ACTIONS NEEDED

7.1 Overview of USAID/Jordan's Current Programs

The current Country Development Cooperation Strategy (CDCS) covering the period 2013-2019 (USAID/Jordan, 2016), amended in 2015 and extended in 2016, lists three main Development Objectives (DOs) and one Special Development Objective (SDO): DO1: Broad-based, inclusive economic development accelerated; DO2: Democratic accountability strengthened; DO3: Social sector quality improved; and SDO4: Gender equality and female empowerment enhanced.

A brief summary of the projects and activities in each of these development sectors follows. The summaries are based on sectoral fact sheets provided by USAID/Jordan, and focus on those that are most relevant for future opportunities to link with actions needed for biodiversity conservation. Section 7.1 is meant only to be a summary of USAID/Jordan's overall portfolio, and the mention of specific projects in this section is not meant to imply that those are the only activities in that sector. The question of the "extent to which" USAID/Jordan's recent or current activities contribute to biodiversity conservation needs will be addressed in Section 7.2.

Economic Development and Energy

USAID/Jordan's Economic Development and Energy Office works with the Government of Jordan to create economic and employment opportunities, improve the country's competitiveness, and expand growth within the private sector. With regard to job creation, USAID works with the government, the private sector, and local organizations to address barriers to employment, especially for women and youth. Training programs matched to employment needs and support for home-based businesses is part of the strategy. To strengthen the international competitiveness of Jordan's private sector, USAID works with the government to establish a better business-enabling environment, and to encourage business growth in key sectors with high potential like tourism and information and communications technology. Increasing access to finance for micro, small, and medium businesses is part of the strategy for improved competitiveness. USAID helps the Government of Jordan to establish tighter controls on government expenditures, increase budget transparency, increase accountability, and reduce opportunities for corruption.

Democracy, Rights, and Governance

USAID works with the Government of Jordan to strengthen partnership and collaboration between governing institutions and their constituents to better address local needs, and to achieve greater democratic accountability, transparency, political pluralism, and a stronger civil society. Three areas of focus are efficient and effective governance, strong civil society and advocacy, and inclusive political engagement. In terms of improved governance, "USAID supports the Government of Jordan as it continues to enact policy and institutional reforms to increase citizen participation, further electoral reform, strengthen an independent judiciary, support decentralization, and combat corruption in order to foster public confidence in the government and strengthen Jordan's long-term self-sufficiency and resilience." The Government of Jordan has passed key political reforms, such as the National Decentralization and Municipalities Law. Civil society organizations are still generally weak, limiting the ability of Jordanians to provide input on issues affecting their daily lives. USAID "strengthens civil

society in Jordan and helps communities make their voices heard by creating a network of trainers to build the capacity of organizations to conduct advocacy campaigns and by training local organizations and community members to develop relevant initiatives.” Regarding political engagement, “USAID works with the Government of Jordan to strengthen political engagement at all levels so that governing institutions effectively reflect and respond to the everchanging needs of the population.”

Water Resources and Environment

USAID/Jordan’s Water Resources and Environment Office supports sustainable water management in Jordan, one of the focal areas under DO3, which aims to improve the delivery of essential public services. USAID has been helping Jordan to improve its water security for more than 60 years. USAID “continues this partnership by improving water and wastewater infrastructure, strengthening water governance, and promoting water conservation so that the people of Jordan have sustainable access to water in order to help build strong, prosperous communities.” Water delivery and wastewater treatment infrastructure has been and continues to be a major area of focus. In terms of water governance, USAID works with the Ministry of Water and Irrigation to strengthen water sector policies in order to reduce water losses and implement sustainable water management. In terms of water conservation, USAID supports the use of water-saving technologies by farmers and households in order to conserve the country’s limited water resources. Water conservation in the agricultural sector is especially critical, because agriculture uses about half of Jordan’s water while contributing only about 3 percent of the gross domestic product. A new activity designed to increase recycling within the commercial sector is under development; it will also work with the MoEnv on solid waste management.

Population and Family Health

USAID continues to support the Ministry of Health to expand and equip several major health facilities, strengthen healthcare management, increase the efficiency of public health spending, train healthcare professionals, and promote healthy behavior. According to USAID/Jordan’s website, USAID is supporting the Government of Jordan to: “1) Expand access and improve quality reproductive, maternal, newborn, and child health services, particularly in communities impacted by the Syrian refugee crisis; 2) Strengthen the resilience of critical components of Jordan’s health system, including the health workforce, healthcare financing, and governance in the health sector; and 3) Construct and renovate key Ministry of Health facilities across Jordan, thus increasing the [Government of Jordan’s] ability to provide essential health services.”

Education

USAID supports the Government of Jordan in expanding access to education for children throughout the country. One major focus is school infrastructure improvements: building, expanding, and rehabilitating schools and kindergartens in underserved areas. USAID works with the Ministry of Education to foster positive learning environments, and supports non-formal education centers throughout the country that help out-of-school students to complete their education and pursue vocational training or secondary education.

Gender

According to its fact sheet titled “Promoting Gender Equality and Women’s Empowerment,” USAID/Jordan “aims in all of its programming in Jordan to reduce gender disparities and empower women and girls to realize their rights, determine their own life goals, and help strengthen their communities.” Three areas of focus for its gender activities are creating supportive norms and practices, supporting effective advocacy and policy reform, and improving gender-sensitive support services.

7.2 Extent to Which USAID/Jordan Programs Are Contributing to Actions Needed

It will be useful to reiterate here that the language in FAA Section 119 requires: 1) a general assessment of “actions necessary” now, and in the future, to conserve biodiversity, and 2) a *prospective* assessment of the “extent to which the actions *proposed*” [emphasis added] for future support by USAID meet the identified needs. It should also be noted that FAA Section 119 does not require USAID Missions to support any actions needed for biodiversity conservation identified by the analyses. However, the intent of Congress in requiring the analysis clearly was to influence USAID programs at the planning stage, with the anticipation that USAID would support actions needed to the extent possible in order to increase the effectiveness and sustainability of their development programs.

A recent USAID guide to “best practices” for conducting these analyses (USAID, 2017a) broadens the “extent to which” analysis beyond the forward-looking legal requirement of FAA Section 119 (and also FAA 118), and requests that these reports “describe how the mission’s *current* CDCS *and/or* planned CDCS and activities” [emphasis added] contribute to actions needed for conserving biodiversity and tropical forests. In fact, analysis of the “extent to which” the *planned* CDCS could contribute is the legal requirement, and is not optional.

In this report, we:

- Analyze the extent to which USAID/Jordan’s current portfolio is contributing to actions needed (this section, Section 7 – Extent to Which), as requested in the best practices guide (USAID, 2017a); and, separately,
- Analyze the extent to which the Mission’s future portfolio under a new CDCS provide opportunities to contribute to the actions needed (in Section 8 – Opportunities), in order to fulfil the prospective legal requirement of FAA Section 119.

Table 7 summarizes USAID/Jordan’s most direct current contributions to “actions necessary” for biodiversity conservation. The 10 broad “themes” or categories of actions needed listed in the table were derived from the more detailed suggestions for actions needed presented in the last section. Some less-direct contributions may not necessarily be reflected in this table.

Table 4. Actions Needed and Contribution of USAID/Jordan Programs

Actions Needed Theme	Current USAID Contribution
1) Integrate biodiversity and ecosystem services considerations into land use and coastal zone strategies and plans and national economic accounting systems	Economic Development and Energy Office support to RSCN contributes to marketing and business development of tourism in protected areas
2) Increase awareness and knowledge of the value of biodiversity and ecosystem services among national decision-makers and the public	Economic Development and Energy Office support to RSCN contributes to awareness of the tourism value of protected areas
3) Develop mechanisms for landscape-scale environmental protection and biodiversity conservation outside of protected areas	
4) Incorporate knowledge of linkages between vegetation and hydrology (ecohydrology) into national water strategies and plans	
5) Develop a comprehensive national rangeland strategy with emphasis on ecosystem services and decentralized governance	
6) Strengthen decentralized natural resources governance at the governorate and municipality level	Democracy, Rights, and Governance Office CITIES Program may be contributing indirectly through general support for decentralization
7) Strengthen environmental and biodiversity safeguards, especially for mining and tourism sectors	Water Resources and Environment Office support for wastewater treatment contributes to general environmental safeguards, although specific links to threats to biodiversity are not clear
8) Implement integrated coastal zone management for Aqaba that ensures the protection of coastal and marine biodiversity	Democracy, Rights, and Governance Office support to Royal Marine Conservation Society (JREDS) in 2016 supported the development of guidelines for integrated coastal zone management in Aqaba
9) Strengthen capacity and commitment of MoEnv and National Biodiversity Committee to achieve actions necessary	
10) Build institutions for better coordination of biodiversity-relevant government agencies and CSOs/NGOs	Economic Development and Energy Office support to RSCN contributes to meeting this need
11) Other	<ul style="list-style-type: none"> Water Resources and Environment Office's recent support to USFS-IP SEED Program (ended December 2018) State Department funding to DOI-ITAP contributes to Park Ranger Training and CITES enforcement support

The Mission’s current activities that contribute to biodiversity conservation in Jordan do not address several of the main “actions needed” themes, and they are a relatively small part of the Mission’s large portfolio (i.e., several million dollars of support out of hundreds of millions).

One biodiversity-relevant activity currently undertaken by USAID/Jordan is part of the Economic Development and Energy Office portfolio. It involves capacity building of the RSCN, which manages many of Jordan’s main protected areas. This support focuses on the business aspects of protected-area tourism, including refining business models and improving marketing and sales, improving financial management, and workforce capacity in business operations.

Another activity with a partial biodiversity conservation focus was the Sustainable Environmental and Economic Development (SEED) Program, managed in the Water Resources and Environment Office. Before SEED ended in December 2018, it provided advisory and technical services through the United States Forest Service International Programs (USFS-IP), including to the RSCN on development of courses on protected area management; environmental education support to the Princess Basma Youth Resource Center; and tree nursery development training to the Ministry of Agriculture’s Forestry Department (USFS-IP, 2015).

The Building Economic Sustainability through Tourism project aims to create an enabling environment that supports competitiveness in the tourism industry. The project has done work focused on ecotourism, such as providing support for the Jordan Trail, a long-distance hiking trail that traverses the landscapes and communities of Jordan from Um Qais in the north to Aqaba in the south.

The Economic Development and Energy Office currently supports the RSCN with a small (\$3.5 million), four-year program (2019-2023) to build the RSCN’s capacity with the business aspects of the protected areas it is responsible for, in particular nature-based tourism. USAID support to RSCN over the past 15 years has contributed significantly to the capacity of this important national conservation NGO.

7.3 Comparison of Actions-Needed Themes with Past USAID/Jordan Analysis

In a comparison of the 10 “actions-needed” themes identified in this analysis with those proposed by USAID/Jordan in the past biodiversity assessments they conducted as inputs to their CDCS process in 2010 and 2013 (USAID/Jordan, 2010; 2013), 5 of 11 themes identified then are very similar to 5 of the 10 themes identified here, as seen in the following table:

Table 5. Comparison of Actions Needed Themes Now and in 2010/2013

Actions Needed Theme – This Analysis	Action Needed Theme – USAID/Jordan 2010 & 2013
Integrate biodiversity and ecosystem services considerations into land use and coastal zone strategies and plans and national economic accounting systems	Build environmental management capacity and foster integrated land-use planning
Increase awareness and knowledge of the value of biodiversity and ecosystem services among national decision-makers and the public	Promote public awareness and expand environmental education
Develop a comprehensive national rangeland strategy with emphasis on ecosystem services and decentralized governance	Prevent overgrazing by livestock and improve range management

Actions Needed Theme – This Analysis	Action Needed Theme – USAID/Jordan 2010 & 2013
Strengthen decentralized natural resources governance at the governorate and municipality level	Promote improved governance types of natural resource management with particular focus on local communities' empowerment and participation with equitable benefit sharing
Strengthen capacity and commitment of MoEnv and National Biodiversity Committee to achieve actions necessary	Assist in capacity-building of the new MoEnv and other associated national civil society organizations

Many of the major actions needed almost a decade ago are apparently still needed now.

8. OPPORTUNITIES FOR USAID/JORDAN TO CONTRIBUTE TO ACTIONS NEEDED

The timing of this FAA Section 119 analysis in relation to the Mission's CDCS development process provides an excellent opportunity to identify and recommend ways of enhancing development through future biodiversity conservation actions.

USAID's Biodiversity Policy described two goals for the agency: 1) conserve biodiversity in priority places; and 2) integrate biodiversity as an essential component of human development (USAID, 2014). The policy recognizes that "biodiversity loss can be driven by unsustainable development, that there are trade-offs between biodiversity conservation and development goals that must be understood and managed, and that biodiversity conservation itself can be a critical tool for achieving sustainable development." The central implication of the USAID Biodiversity Policy is that biodiversity conservation is not a development "sector" per se; rather, biodiversity should be seen as a foundation for any and all sustainable development. It is thus cross-cutting in the same way gender or climate risk are; all must be "mainstreamed" for effective, sustainable, resilient development.

In every country, biodiversity is a public good and a part of the national heritage. As such, its conservation and sustainable use requires collaboration and partnership between government, the private sector, civil society organizations, and the public. Biodiversity is neither a commodity to be leased to the private sector, nor a special interest to be assigned to a narrowly focused sector of civil society. Ultimately, government has the responsibility to ensure that biodiversity is conserved and wisely used. Through its programs, USAID/Jordan can support the Government of Jordan to fulfill its responsibility and develop those needed partnerships; that will put it on the road to social-ecological self-reliance.

In this context, this analysis has identified two types opportunities for USAID/Jordan to consider as it develops its next CDCS. One type of opportunity follows directly from the view of biodiversity just described. That is, these are opportunities for increasing the effectiveness of the Mission's development objectives in traditional development sectors (e.g., economic growth, democracy and governance, education, health) – and also making them more sustainable and resilient – by taking advantage of the benefits of biodiversity to human social and economic development. In this view, biodiversity conservation is the "means" to a development "end." In this view, the "actions needed" for biodiversity conservation are tools for achieving economic growth, democratic governance, education, or health objectives. For example, supporting the decentralized, participatory planning processes needed to conserve and sustainably manage rangelands, or ecosystem services in watersheds, can bring together diverse stakeholders and begin to build their capacity for improved governance in general, thus supporting a broad democratic governance objective. Funding for this type of opportunity could easily be justified under the Mission's Democracy, Rights, and Governance development objective, but would also contribute to biodiversity conservation. Another example would be to support forest and rangeland conservation and restoration to improve water capture and groundwater recharge, thus helping to achieve a water-supply objective through an activity that benefits biodiversity.

A second type of opportunity is to incorporate support for conserving natural ecosystems and species in the activities of all development sectors. In this view, carefully designed activities in any sector can support biodiversity conservation objectives while also achieving their own goals, creating a "win-win," "more bang for the buck" situation. USAID/Jordan's current support to the RSCN, focused on building

business, financial, and marketing capacity related to ecotourism in protected areas, is an example. Co-locating facilities that provide population, maternal, and child health services in communities participating in biodiversity-conservation-related projects would be another example.

We argue that these two views are both valid and provide USAID/Jordan with a wide range of opportunities for integrating biodiversity considerations into its development portfolio as it develops its new CDCS. We believe that USAID/Jordan should consider developing at least one major activity that integrates biodiversity issues into one or more of its development objectives.

Table 6 presents a matrix to illustrate the potential interaction, overlap, and synergy of “actions necessary” for biodiversity conservation and sectoral development objectives of USAID/Jordan. It is intended to illustrate both opportunities for actions needed for biodiversity conservation to contribute to and enhance sustainable, resilient development outcomes, and opportunities for sectoral development activities to contribute to actions needed for biodiversity conservation. Highlighted cells in the matrix show potential opportunities, which are then briefly discussed below. The most important of them will be further described in Section 9 – Recommendations.

Table 6. Actions Needed and Opportunities for Future Contributions by Development Objective

Theme: “Need to....”	USAID/Jordan Development Objective			
	DOI: Broad-based, inclusive economic development accelerated (job creation through local enterprises; promoting investment, exports, improving business climate; increasing competitiveness in the tourism industry)	DO2: Democratic accountability strengthened (increase the effectiveness of municipal governance and support decentralization; strengthen democratic accountability and effective rule of law through improved institutions and increased civic and private-sector participation)	DO3: Social sector quality improved (improve: water delivery and sewage treatment infrastructure; reproductive and family healthcare services; quality of early-grade public education)	SDO4: Gender equality and female empowerment enhanced (reduce gender disparities and empower women and girls through access to education and gender-specific health services)
1) Integrate biodiversity and ecosystem services considerations into land use, coastal zone, and water strategies and plans	X	X	X	
2) Increase awareness and knowledge of the value of biodiversity and ecosystem services among national decision-makers and the public	X	X	X	
3) Incorporate biodiversity and ecosystem services values in national economic accounting systems	X	X	X	
4) Develop a comprehensive national rangeland strategy, with emphasis on ecosystem services and decentralized governance	X	X	X	X
5) Strengthen environmental and biodiversity safeguards, especially for mining and tourism sectors	X	X	X	
6) Develop an integrated coastal zone management system for Aqaba that ensures the protection of coastal and marine biodiversity	X	X		
7) Incorporate knowledge of linkages between vegetation and hydrology (ecohydrology) into national water plans and strategies	X	X	X	
8) Strengthen decentralized natural resources governance at the governorate and municipality level	X	X	X	X

Theme: “Need to....”	USAID/Jordan Development Objective			
	DOI: Broad-based, inclusive economic development accelerated (job creation through local enterprises; promoting investment, exports, improving business climate; increasing competitiveness in the tourism industry)	DO2: Democratic accountability strengthened (increase the effectiveness of municipal governance and support decentralization; strengthen democratic accountability and effective rule of law through improved institutions and increased civic and private-sector participation)	DO3: Social sector quality improved (improve: water delivery and sewage treatment infrastructure; reproductive and family healthcare services; quality of early-grade public education)	SDO4: Gender equality and female empowerment enhanced (reduce gender disparities and empower women and girls through access to education and gender-specific health services)
9) Strengthen role and capacity of MoEnv and National Biodiversity Committee to achieve actions necessary	X	X	X	X
10) Build institutions for better coordination of biodiversity-relevant government agencies and CSOs/NGOs	X	X	X	X

Opportunities in Economic Development

Opportunities for future programs to link broad-based, inclusive economic development exist for all of the 10 actions-needed themes. The value of ecosystem services of all kinds, but especially soil protection and for hydrological services in watersheds, needs to be recognized by government and private-sector actors. Payment or compensation mechanisms to conserve these services provided by biodiversity need to be tested and further developed. The threats to biodiversity and ecosystem services that could be caused by poorly planned development in every sector, but perhaps especially mining and tourism, need to be controlled through environmental impact assessments and safeguards. Decentralizing governance related to ecosystems services to the governorate or municipality level has economic implications, because funding mechanisms at those scales, rather than only the national scale, will be needed. The National Biodiversity Committee needs members who can bring economic perspectives to bear on questions of development in Jordan, and work with the MoEnv and other ministries to coordinate on economic issues.

Opportunities in Democracy and Governance

Strengthening democracy and governance through biodiversity conservation and sustainable natural resources management presents a wide menu of opportunities. Sustainably managing ecosystem services, and the other benefits and values of natural ecosystems and species requires good governance at the national, regional, and local levels – balanced, decentralized governance – in order to resolve economic trade-offs and resolve conflicts. Biodiversity issues are often one of the best entry-points for engaging stakeholders in processes to strengthen governance, such as landscape-scale planning. Partnerships and collaboration between government (at all levels), civil society organizations, the private sector, and the public are essential for sustainable use of biodiversity.

Opportunities in Water Resources and the Environment

According to Jordan's National Water Strategy 2016-2025, "Jordan looks to water as central to a nexus of social, economic and political issues that affect agriculture, energy, cities, trade, finance and national security. Water is not only indispensable for human life, seen by many as a right, but is also a unique economic and social good, a commodity in its own right and a crucial link between humans, the environment and the economic system" (MWI, 2016, p. 3). Jordan's National Water Strategy confirms that a substantial portion (approximately 53 percent in 2019) of the country's water supply is *renewable* water (MWI, 2016, p. 11, Table 1). That portion of the water supply would potentially be susceptible to increase or stabilization through ecohydrological restoration, conservation, and management. That is probably the reason that conserving and restoring watersheds is listed as an "action needed" in the National Water Strategy. Using a watershed perspective in planning and management automatically creates a platform for integration of ecological and social systems. USAID/Jordan has an opportunity to join Jordan in using water as the concept for integrating biodiversity conservation, agriculture, economic development, health and sanitation, and climate change adaptation and mitigation.

Opportunities in Population and Family Health

Demographic pressure from Jordan's high population growth rate (*i.e.*, from births, not migration) is a driver of many of the political, economic, and social causes of threats to the country's biodiversity. Unchecked population growth will ultimately prevent sustainable and self-reliant development. In that regard, all assistance from USAID/Jordan that will improve maternal-child health and family planning services is an opportunity to support biodiversity conservation, in the long run. More proximate opportunities exist, however, through co-location strategies, in which USAID/Jordan's population and

family health activities would be deliberately targeted, at least in part, to areas where projects integrating conservation with other sectoral development objectives were being implemented.

Opportunities in Education

Several kinds of opportunities to strengthen biodiversity conservation through educational activities exist. They relate especially to one of the actions-needed themes identified by this analysis: the need for increased awareness and knowledge of the value of biodiversity and ecosystem services among the public and decision-makers. Support for basic public education could contribute, in the long run, if school curricula were made more relevant to this task. Non-formal, adult education, and awareness-raising activities are also urgently needed, and support for such activities would require a broad view of education. A co-location strategy for education activities, like that mentioned for the health sector, could also help support biodiversity conservation activities – that is, support for schools and basic public education could be deliberately targeted, at least in part, to places where biodiversity-related projects were occurring.

Opportunities in Gender

USAID/Jordan's goal "to reduce gender disparities and empower women and girls to realize their rights, determine their own life goals, and help strengthen their communities" through its Special Development Objective creates several kinds of opportunities to link with biodiversity integration objectives and support the USAID Biodiversity Policy. One kind of opportunity is related to population growth, discussed above. Because of the correlations between gender equality and female empowerment and family planning and reproductive health, gender mainstreaming will contribute to addressing a key driver of the causes of threats to Jordan's biodiversity. Several cells in the matrix above have been marked to indicate two other kinds of opportunities. One relates to links with decentralized natural resources governance and management, and especially perhaps as related to rangelands. Women (and girls) have unique knowledge, roles, and responsibilities when it comes to interacting with natural systems, often especially in traditional cultures. Sustainable natural resources management, therefore, requires their advice and participation. The last two actions-needed themes relate to national processes and institutions for mainstreaming biodiversity. Those will benefit from participation by women, and conversely, women's participation will provide experience that will help to empower them.

9. RECOMMENDATIONS

USAID's Best Practices Guide for Tropical Forest and Biodiversity Analyses (USAID, 2017a) states that the analysis team should provide recommendations that strengthen the "extent to which" the mission is addressing the "actions necessary" for biodiversity conservation and "that actively integrate biodiversity conservation into health, food security, economic growth, governance, or other sector programming." The Scope of Work for this FAA Section 119 Biodiversity Analysis for Jordan asked the analysis team to follow the Best Practices Guide.

In Section 8, we discussed potential opportunities for USAID to integrate biodiversity conservation into its development portfolio; those opportunities were developed logically from the threats-causes-actions-needed analysis presented in earlier sections. In this final section, we have selected and integrated some of the opportunities into a handful of general recommendations that we believe would enable USAID/Jordan to support some of the most urgent needs for biodiversity conservation in the country and at the same time make its sectoral development interventions more effective, sustainable, and resilient. The opportunities presented earlier are a wide "menu"; here we recommend a selected subset of those that we think are more important and/or higher priority.

9.1 Integrate Biodiversity Conservation into USAID/Jordan Strategy and Program Design

Implement the USAID Biodiversity Policy in the Next Jordan CDCS

The FAA 119 analysis team recommends that USAID/Jordan strives to integrate biodiversity conservation into its development portfolio, as called for in the USAID Biodiversity Policy, both as a way to increase the effectiveness and sustainability of its sectoral development objectives, and to allow those sectoral programs to contribute to the actions necessary to conserve biodiversity in Jordan. These two approaches were discussed in Section 8.

Integration of conservation and development is more than co-location of activities supporting biodiversity objectives and sectoral development objectives – but co-location may be better than nothing, except that it sometimes can have unintended consequences, such as attracting settlement and increasing populations on the borders of protected areas.

USAID/Jordan should develop a plan for facilitating the integration of biodiversity conservation called for in the USAID Biodiversity Policy. The CDCS process provides an entry point to integrate biodiversity conservation by using the results of this analysis of Jordan's biodiversity required by FAA Section 119 to evaluate the importance of biodiversity conservation and ecosystem-based approaches in achieving national development goals (e.g., in economic development, democracy and governance, water resources, health, education, and mitigating and adapting to climate change). Integrating environmental and biodiversity conservation in its new CDCS would support many of the "actions necessary" identified by the Government of Jordan in its own official reports and plans.

Identify an In-House Champion for Integration in USAID/Jordan

The goal of integrating "biodiversity as an essential element of human development" called for in the USAID Biodiversity Policy requires what it calls "internal change for external impact" – that is, building USAID's own internal capabilities and systems to more effectively integrate biodiversity and development is required (USAID, 2014, p. 14). We recommend that USAID/Jordan identify and designate an in-house champion to promote the concept and lead the process of integrating environment and biodiversity considerations across the mission's portfolio in order to support this

“internal change for external impact.” A parallel need is for active support from USAID/Washington (E3 and Middle East Bureaus); we recommend that USAID/Jordan request that needed support.

9.2 Use Ecosystem Services at Watershed Scale as a Framework for Integrated Programs

In making recommendations for future USAID/Jordan programming under a new CDCS framework, we imagine that those programs and activities will be designed to motivate and support the Government of Jordan and its national partners to increase both the capacity and commitment needed to implement and sustain the actions necessary for biodiversity conservation, leading to national self-reliance in this regard. Because the benefits of biodiversity – ecosystem products, ecosystem services, and non-material benefits – are an essential and irreplaceable foundation of human livelihoods and well-being in every country, national development strategies, plans, and ongoing decision-making processes must take biodiversity into account.

Support a National Eco-Hydrological Inventory

In most of the national documents on water we reviewed, there was a striking gap in information about, and discussions of, hydrology and watersheds, and barely any mention of the relationship between vegetation and hydrology (i.e., ecohydrology). Such information was absent even in documents where we would have expected it, such as the evaluation of groundwater trends and forecasts in Jordan by the U.S. Geological Survey (USGS, 2016) or the hydrological evaluation of the Wadi Karak Basin (Fadda, 2011). This lack of information was surprising, given the significant attention paid to this topic in other regions and countries where USAID works, most of which are not as water-scarce as Jordan. Although it is not clear to the analysis team why this information gap exists, we hypothesize that perhaps it is because water development and management in Jordan has been, so far, “siloe” and cut off from the development and management of other natural resources and ecosystems (e.g., forests, rangelands, protected areas), and focused exclusively on technical and engineering solutions to water scarcity. We conclude that an analysis and inventory of the ecohydrology of surface and groundwater is needed in Jordan. It should be conducted on a watershed-by-watershed basis that would provide water budget/water balance information to determine the availability of renewable water by watershed. The information should be made readily accessible in Jordan and internationally.

In a report titled “Forests, Rangelands and Climate Change in Jordan,” the FAO recommends linking water and forestry issues and implementing projects that link “forests and watershed environment management, such as watershed management.” (FAO, no date, p. 11) Jordan’s Fifth National Report to the CBD hints at the important linkages between vegetation and water, but does not contain a clear conceptualization of ecohydrological ecosystem services. It states that “The destruction of habitats through overgrazing for example results in severe soil erosion and leads to detrimental and often irreversible impacts on the ecosystems ability to maintain the watershed and their conveyance functions as well the soil capacity to support the plant germination and regeneration” (MoEnv, 2014, p. 40).

Water limitation has a strong effect on the interactions between soils, the atmosphere, and vegetation in Mediterranean regions, according to a study on the ecohydrology of Mediterranean ecosystems by Montaldo and colleagues. “The contrasting water relations of the two main plant functional types (grass and woody vegetation) in these savanna-like water limited ecosystems impacts significantly the land surface fluxes and is therefore of importance to water resources and ecosystem management” (Montaldo et al., 2013, p. 1123).

Strengthen Decentralized Governance Through Ecosystem Services Management Actions

A growing body of experience from around the world shows that ecosystem services and their management are an entry point for addressing governance issues. This is especially true in countries with a high dependence on ecosystem services, as is the case in Jordan with water. Ecosystem services can only be conserved and maintained at the appropriate ecological scale; depending on the ecosystem service, this scale is often sub-national. Management for ecosystem services therefore often requires decentralized governance; in Jordan this would mean at the governorate, municipality, or community level. Supporting initiatives in decentralized governance for ecosystem services can be a tool in strengthening governance related to other issues, for improving distributional justice, and for conflict resolution (Flinzberger, 2018b, p. 67). We believe this represents an opportunity for USAID/Jordan's Democracy, Rights, and Governance program to implement the USAID Biodiversity Policy.

9.3 Build on and Replicate Successful Biodiversity and Development Integration Models Already Tested

A number of initiatives carried out over the past decade in Jordan, mainly with funding from other international donors, have begun to demonstrate successful models to address the actions needed for integrating biodiversity issues into sustainable, resilient development in Jordan. USAID/Jordan should evaluate, learn from, and support programs to replicate and expand the lessons learned from these experiences. Again, the idea is that USAID/Jordan's programming would motivate and support the Government of Jordan, CSOs, NGOs, and the private sector to do this, and institutionalize these new models in a sustainable and self-reliant manner. The most salient of these experiences are summarized below. These examples may represent good opportunities for USAID/Jordan to support on-going efforts by other donors or encourage expansion of these activities.

Ecosystem Services Experiences

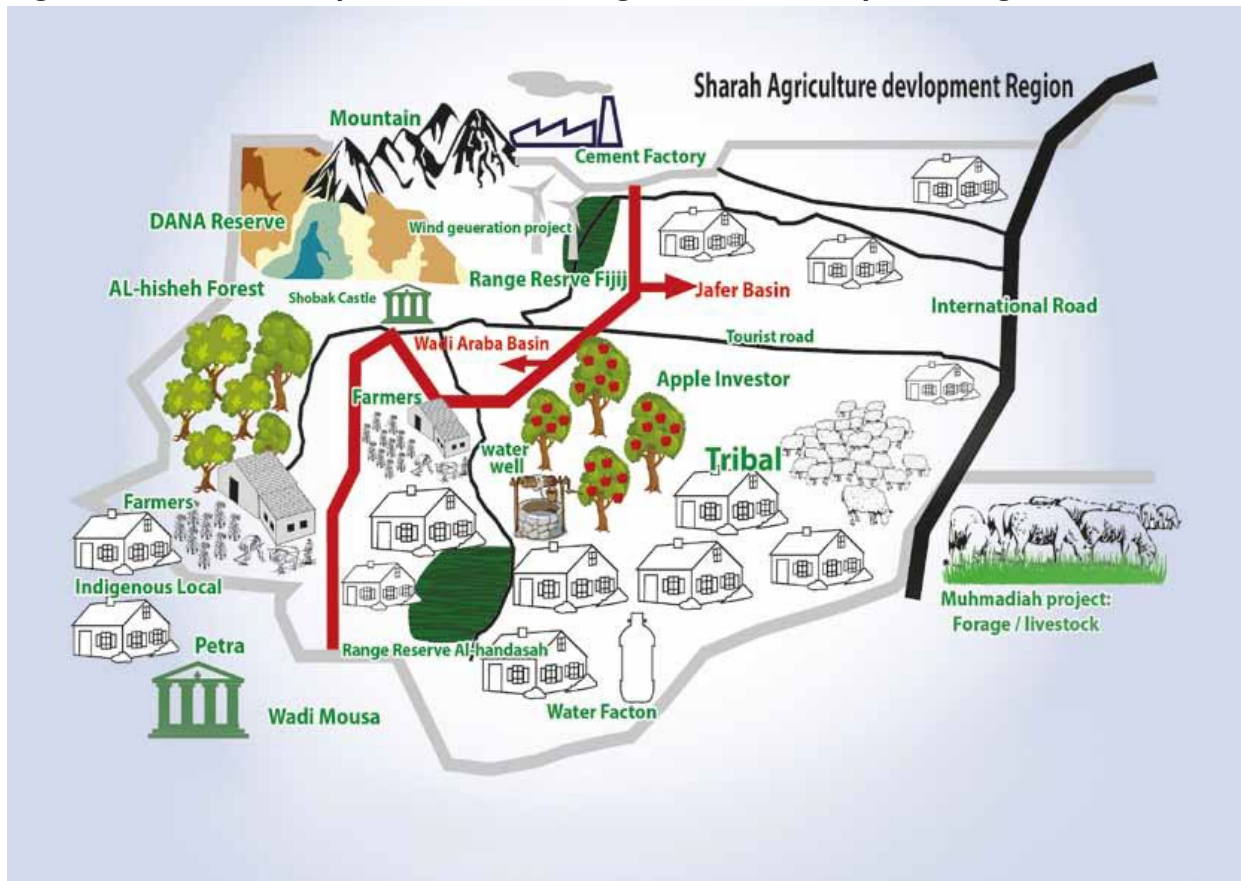
A number of "actions necessary" for conserving Jordan's biodiversity relate to its importance as the source of valuable and irreplaceable ecosystem services. Using an ecosystem services framework could open up a number of opportunities and options for USAID/Jordan to integrate biodiversity with development. In doing so, USAID/Jordan should build on the lessons already learned by Jordanian government agencies, NGOs, and communities in pilot work supported largely by other international donors. A study on "Mapping Ecosystem Services in the Jordan Valley, Jordan" (Luz, et al., 2016) concluded that "Further research on modelling habitat quality and ecosystem services is needed to support decision-making on land management."

One important experience to learn from, and potentially replicate and expand, is the "Sustainable Use of Ecosystem Services in Jordan" project, which has been supported for the past five years by the German development agency, GIZ (GIZ, 2019). The project has worked with the MoEnv to highlight the importance of intact ecosystems and their ecosystem services, including "the multiple and complex interactions between water, soils, plants, animals, and humans that are essential for the economy, nutrition and people's livelihoods." Integrated field case studies of rangeland and watershed management have been conducted, and lessons from them can inform improved policies for conserving ecosystem services. Improved policies are needed, according to GIZ, because "Decisions on new infrastructure projects, land use or state investments do not take the importance of biodiversity and ecosystem services into consideration."

Another important experience comes from the IUCN-ROWA project on "Mainstreaming Biodiversity in the Sylvo-pastoral and Rangeland Landscapes in Al Sharah" (IUCN-ROWA, 2019a). This pilot project

focuses on the Al Sharah Agricultural Development Region, Ma'an Governorate, in southern Jordan. It is being implemented by IUCN-ROWA) with Jordanian partners, the Ministry of Agriculture and RSCN, and funding from the International Fund for Agricultural Development. It is designed to integrate participatory community planning and poverty reduction activities in parallel with biodiversity conservation activities. The project plans to demonstrate economic benefits of livelihoods linked to biodiversity conservation. "It will mainstream biodiversity conservation in sylvo-pastoral and rangeland management activities, particularly in buffer zones associated with existing (and proposed) Nature Reserves, and produce local economic benefits and poverty alleviation in a sustainable and replicable manner. The project will also share knowledge to replicate successes elsewhere in Jordan" (IUCN-ROWA, 2019a). The project intends to be a model for replication and scaling up, so USAID/Jordan could evaluate it, learn from it, adapt it as needed, and replicate it elsewhere under a future project.

Figure 8. Schematic Map of the Al Sharah Agricultural Development Region



(source: IUCN-ROWA, 2019c)

A recommendation of the IUCN-ROWA experience in Al Sharah is to test and pilot negotiations of PES [payment for ecosystem services] contracts through small-scale initiatives in order to learn how they can best be "mainstreamed" at a larger scale" (IUCN-ROWA, 2019c).

Landscape/Watershed Scale Experiences

Water is a key ecological resource in Jordan because of its scarcity, and its conservation and management are a key to sustainable development. As we argued earlier, water can be viewed as an ecosystem service, requiring planning and management at the scale of watersheds. Interesting work has

been done in the area of Wadi Karak, supported by the GIZ Sustainable Use of Ecosystem Services project mentioned above (Flinzberger, 2018a; 2018b; GIZ, 2019a; 2019b).

The plateau area in the eastern part of the Karak Governorate and Wadi Karak watershed is most suitable for grazing activities or animal-related agriculture. Four main watersheds with steeply incised river canyons descend from the plateau to the Dead Sea to the west, the largest and most populated of which is Wadi Karak. Irrigated agriculture and herding are widespread along the river valleys here. In the lower watersheds near the Dead Sea, flat areas support intensive irrigated agriculture producing tomatoes, melons, citrus fruits, and other crops. Flinzberger writes that: “The sequence of a populated plateau, an agricultural used Wadi Karak, and lowlands (irrigated with water from Wadi Karak) form a stereotypical upstream-downstream relationship. Particularly originating from water scarcity this relationship is fragile and full of controversial interests” (Flinzberger, 2018b, p. 22). An area such as Karak is a rich source of lessons to be learned about the social aspects of such a social-ecological system.

In terms of water resources, big wells on the Karak Plateau supply water from groundwater aquifers to the city, but current extraction probably exceeds natural recharge rates (USGS, 2016). Fadda (2011) conducted a preliminary mapping of the precipitation versus groundwater in the Wadi Karak watershed that is a first step in determining a renewable water budget/water balance that could be used in ecosystem-services planning (see recommendation 9.2, above).

Karak is also a source of lessons because of the Karak Environmental Sustainability Plan. Completed in 2017, it is the first strategic plan addressing environmental sustainability at the governorate level in Jordan, the result of a multi-stakeholder effort facilitated by the Jordan Hashemite Fund for Human Development (JOHUD). The plan was developed with “representatives from the Governorate Development Unit, the departments of Environment, Agriculture, Tourism, Water, Education, the Royal Society for the Conservation of Nature, Mu’tah University, the Municipality of Karak, three local Community Based Organizations, and five representatives from the Youth forum in Karak; in addition to the JOHUD and the GOPA project team. The plan preparation team included five women [sic] members.” The Karak Environmental Sustainability Plan “was prepared in line with the national development directives elaborated in the Jordan 2025 vision and strategy, and is intended to be one of the pilot models adopting the principles and applications of the Royal vision for the decentralization of governance through fostering the principles of environmental sustainability, local participation, and social equity in the management of governorate natural resources.”

IUCN-ROWA’s experience with payment for ecosystem services as a framework for negotiations among stakeholders is similar. Working at the nexus of governance, nature conservation, and economic development, payment for ecosystem services mechanisms “can promote ownership and empowerment of communities at different levels, from small holders to decision-makers including [the] private sector to conserve nature” (IUCN-ROWA, 2013c).

Decentralized Governance Experiences

Given the movement toward more decentralized governance in Jordan, and USAID/Jordan’s interest in supporting it, it is important to learn lessons from experiences with how decentralized governance of natural resources and ecosystem services can be developed. The Karak Environmental Sustainability Plan case study just discussed is an important model. Other relevant experience comes from efforts to restore sustainable livestock systems in the Zarqa River Basin and elsewhere in Jordan. Almost all sources agree that Jordan’s rangelands – which cover 80 percent of the country or more – are degraded. In 2013, the Ministry of Agriculture updated its Rangeland Strategy for Jordan (MoA, 2013), a reorientation that brought the strategy into harmony with three relevant conventions: the Climate

Change Convention (UNFCCC), the Biodiversity Convention (CBD), and the Convention to Combat Desertification. The updated strategy has a “comprehensive set of specific projects and activities.... to achieve certain goals and implement the Hima approach in managing range resources sustainably,” according to the Minister of Agriculture at that time. The “Hima” system referred to is a modern adaptation of a traditional Bedouin grazing management, in which herds or flocks are regularly and systematically moved to “rested” areas, with the intent to maximize the quality and quantity of forage growth overall. Resting grazed lands allows the vegetation to renew energy reserves, rebuild shoot systems, and deepen root systems, resulting in long-term maximum biomass production. This has also been called intensively managed rotational grazing (Westerberg and Myint, 2014, p.13). Jordan’s experience with restoring Hima-type rangeland governance and management has generated considerable interest and attention in the country, region, and beyond (ILRI, 2019; IUCN-ELD, 2015; UNEP, 2016).

The updated policy and its call for restoring the traditional – decentralized – rangeland governance system called Hima have been summarized thusly by one source:

Bedouin people in Jordan have governed their rangelands through their own land tenure systems and grazing rights known as “Hima” for millennia. Jordan’s Rangeland Strategy embraces this traditional, holistic concept, which effectively integrates natural resources, community life, ethics, animal welfare, and more. Promising pilot projects have achieved excellent biodiversity benefits. The Hima concept mirrors the landscape restoration approach which is promoted globally by key stakeholders in combating land degradation. (FuturePolicy.org, 2019)

Figure 11. Bedouin Herder in the Hima of Era-Jordan



(photo credit: IUCN/ILC Rangelands Initiative/Mahfouz Abu Zanat)

Updated Rangeland Strategy for Jordan 2013-2014 on Reviving the Traditional Bedouin “Hima” Grazing System

“The Bani Hashem community in Zarqa area presents a successful example of the re-introduction of the Hima system. The reviving of the Hima system at Bani Hashem villages is an attempt for showcasing how strengthening local community capacities (of both women and men) enables them to protect and manage their land resources in proper communal efforts that will be reflected positively on their natural resources as well as socio-economic growth. The community (supported by the Ministry of Agriculture) has identified 1500 hectares of public forest land that they refer to as ‘the last green area’ in the rapidly industrialising Zarqa river basin area. Negotiations between the Bani Hashem community and the Directorate of Rangelands and Badia Development, involving the prime minister’s office were carried out to grant the community the right to manage the lands as rangelands. Approval was given to the community to start management on 100 Ha, to be scaled up to 1500 Ha if this management attempt proves to be successful. Through ‘Securing Rights and Restoring Lands for Improved Livelihoods’ project, led by IUCN ROWA, the community at Bani Hashem has developed a local tribal law, called ‘Meathak Sharaf,’ to help enforce the new land management system by restricting grazing. Meathak Sharaf has been endorsed by the Zarqa governor who represents the local government and can help enforce the law. The Ministry of Agriculture has established a community-based group (Hima Bani Hashem) to follow up and sustain the process. After one year of activities and protecting their Hima area from the herders but without using any fencing, biodiversity benefits have already become observed through the increase of biomass and restoration of indigenous floral species such as *artemisia herba-alba*. Protecting the pilot area allowed shrubs and grasses to regenerate, restoring the land’s vegetation” (MoA, 2013, p. 13).

A “comprehensive economic valuation study of a large-scale rangeland restoration scenario was undertaken within the Zarqa River Basin. ... The social benefits of Hima restoration were shown to be substantially larger than the investment costs over a 25-year time horizon. A case is thus made for scaling up Hima systems within the Zarqa River Basin and the Jordanian Badia as a whole” (Westerberg and Myint, 2014, pp. 12-13).

IUCN-ROWA is implementing a project called HERD – Healthy Ecosystems for Rangeland Development in Jordan and Egypt, funded by the Global Environment Facility (GEF). It aims to strengthen “restoration and sustainable management of pastoral rangelands for the provision of ecosystem services and protection of biodiversity” and “to catalyze the scaling-up of HERD, both regionally and globally.” (IUCN-ROWA, 2019d).

Biosphere Reserves

The UNESCO Man and the Biosphere Program coordinates a global network of biosphere reserves (686 in 122 countries), two of which – the Dana and Mujib Biosphere Reserves – are located in Jordan. These reserves are meant to provide laboratories and models for the development of a sustainable relationship between people and the ecosystems they inhabit. As such, they are natural testing grounds for the vision and objectives expressed by the USAID Biodiversity Policy, and USAID/Jordan should strongly consider using them as proving grounds for the integration of conservation and development. The Mujib Biosphere Reserve lies within two governorates, Madaba and Karak; Wadi Karak, discussed above as a potential model, is south of the biosphere reserve. The Karak Environmental Sustainability Plan is a model that seems well-suited to support the vision and goals of the biosphere reserve, and a potential future project could facilitate the linkage of these two governance and economic development models.

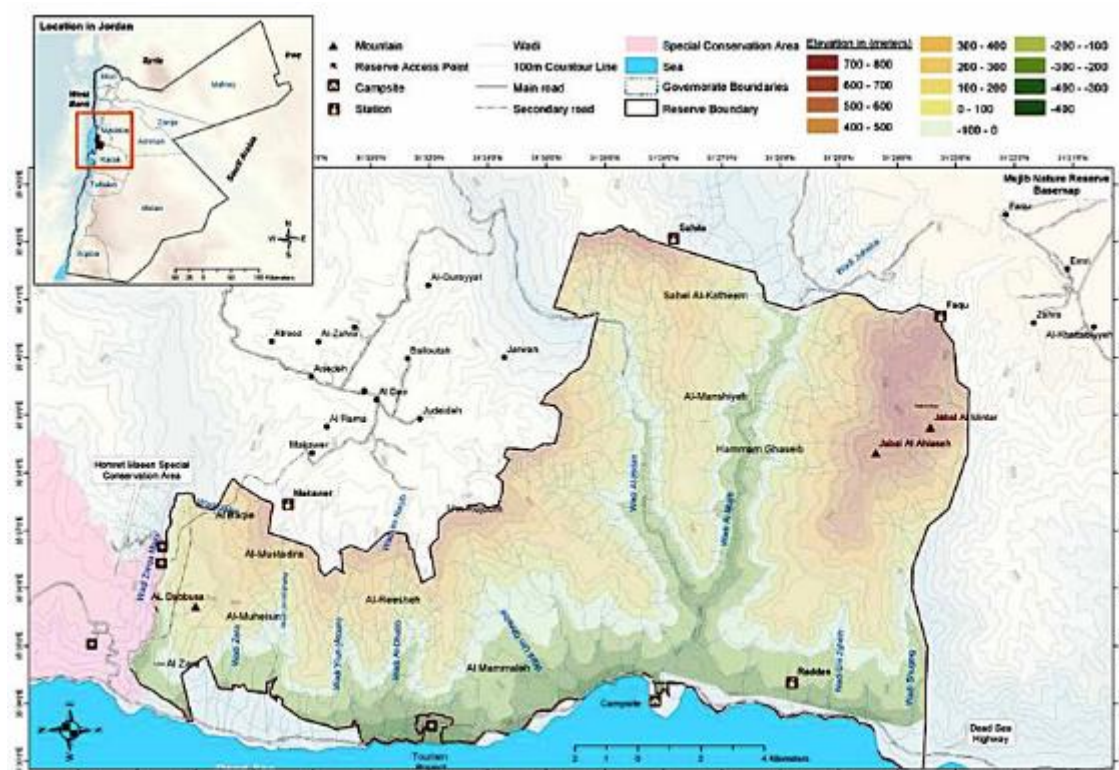
Figure 13. Landscape of the Dana Biosphere Reserve



(Photo courtesy of Wikipedia https://en.wikipedia.org/wiki/Dana_Biosphere_Reserve)

Except for the Wadi Rum World Heritage Site, with an area of 729 square kilometers, the two biosphere reserves are by far the largest protected areas in Jordan, each are at least 10 times as large as any other single protected area in the country (see Table I, Section 4): the Dana Biosphere Reserve is around 300 square kilometers, and Mujib Biosphere Reserve is 212 square kilometers.

Figure 14. Mujib Biosphere Reserve Map



(Source: UNESCO-MAB <http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves/arab-states/jordan/mujib/>)

Strengthen Donor Communication and Collaboration on Integrating Biodiversity in Development

The piggy-backing on past projects of other donors recommended here suggests the need, opportunity, and benefits of strengthened donor collaboration and coordination on environment and biodiversity, and on integrating conservation and development, in Jordan.

9.4 Support Biodiversity Awareness and Education

A number of “actions necessary” identified by this analysis relate to awareness and education, including, for example, the need to:

- Improve environmental and biodiversity education in formal and non-formal education systems;
- Raise awareness of the importance of biodiversity conservation among national decision-makers and the public; and
- Increase understanding of the values of biodiversity and ecosystem services in order to improve public participation in biodiversity conservation and environmental sustainability.

Two types of support that USAID/Jordan could provide through future programs could contribute to meeting these needs, and are summarized below.

Support Environmental and Biodiversity Education in Public School Curricula

With its long and important experience in support for public education in Jordan, USAID/Jordan has the potential to contribute to much needed national awareness and commitment to biodiversity conservation and environmental sustainability. Partnering with the Government of Jordan to develop

environmental literacy components in national curricula at all levels of formal public education would be one possibility. Important national NGO partners such as the RSCN could be involved in, and contribute to, such a process of curriculum upgrade. Given their management responsibilities for protected areas, they could also be involved in organizing field trips and learning visits to protected areas from nearby schools. USAID/Jordan has apparently supported something similar in the past, according to a document provided by the Mission, which stated that “Their environmental education program, in cooperation with the MOE, centers on the more than 1,000 nature clubs in schools across Jordan, using the network of nature reserves as outdoor training centers for environmental education programs.” (USAID-Jordan, 2013, p. 3). Another possible option for testing models of environmental and biodiversity education would be to include public education components in future integrated conservation and development projects supported by USAID/Jordan.

Support Journalism and Media Communications on National Natural Heritage

Projects designed to support earlier recommendations for landscape- and watershed-scale ecosystem services and decentralized natural resources governance could be designed with a communications component that would reach local (municipal and governorate), national, and international audiences. It would educate non-formal adult audiences through stories in diverse media about the importance of natural ecosystems and species in Jordan’s history and in future sustainable development, including tourism, water resources development, combatting desertification, and climate change. Training programs, fellowships, and exchange programs for environmental journalists could be a part of such a project-linked communication activity.

9.5 Continue Support for Population, Reproductive Health, and Women’s Empowerment

Jordan’s high birth rates are a long-term driver of the causes of threats to ecosystems, species, and sustainable development, as was discussed in Section 5. Therefore, USAID/Jordan should continue to support activities in maternal, child, and reproductive health services delivery and gender-sensitive development that address this issue. Two potential mechanisms for integrating these health and gender activities into future integrated conservation and development programs are outlined below.

Regional peace, stability, and security are also drivers of refugee flows, which have caused significant growth in Jordan’s population, and those challenges must also be resolved in order to bring about a sustainable balance between humans and the environment.

Integrate Population and Reproductive Health Service Provision in Integrated Conservation and Development Projects

Two possible strategies for integrating population and reproductive health with conservation are co-location and education. In a co-location strategy, reproductive, maternal, and child health services would be made available in communities involved in future integrated conservation and development projects supported by USAID/Jordan. An education strategy could be less location-specific, and would use education and communication methods and media to raise awareness of the connection between population growth and resource depletion.

Promote Empowerment of Women in Natural Resource Dependent Economic Activities

USAID/Jordan should ensure that future programs help to raise awareness of the role of women in herding and rangeland management, tourism, small-scale agriculture, water conservation and

management, and other aspects of natural resources management. Future integrated conservation and development projects supported by USAID/Jordan should assess needs and provide extension services aimed at women involved in such activities. The USAID Land and Urban Office concurs with this recommendation in saying that USAID/Jordan should “Support women’s role[s] as managers, users, and beneficiaries of land and natural resources.” (USAID-LandLinks, 2018). USAID/Jordan’s *Strategic Synthesis of Program Literature on Development in Jordan* mentions the importance of female economic and political empowerment to achieving “sustainable gains in family planning and reproductive services” (USAID/Jordan, 2019, p. 35).

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II. Annexes

Annex A: Scope of Work

USAID JORDAN 119 ANALYSIS SCOPE OF WORK

1. BACKGROUND

As part of the documentation for the 2020-2025 Country Development Cooperation Strategy (CDCS), USAID/Jordan is required by Section 119 of the Foreign Assistance Act, as amended, to prepare an analysis of biodiversity in Jordan.

By mandating an FAA 119 analysis (hereafter referred to as “the analysis”), the U.S. Congress is recognizing the fundamental role that biodiversity plays in supporting countries as they progress along the journey to self-reliance. The analysis will examine the country-level biodiversity conservation needs and the extent to which the mission is currently addressing biodiversity conservation. The report recommendations will help missions strengthen a countries’ commitment and capacity to biodiversity conservation by incorporating biodiversity considerations in the CDCS.

1.1 SUMMARY OF RELEVANT PARTS OF FAA SECTION 119

FAA Section 119, as amended, require that USAID missions address the following:

FAA Sec 119 Endangered Species

(d) COUNTRY ANALYSIS REQUIREMENTS. Each country development strategy, statement, or other country plan prepared by the Agency for International Development shall include an analysis of:

- 1) The actions necessary in that country to conserve biological diversity, and
- 2) The extent to which the actions proposed for support by the Agency meet the needs thus identified.

The FAA 119 analysis for USAID/Jordan must adequately respond to the two questions for country strategies, also known as “actions necessary” and “extent to which.”

1.2 PURPOSE

The primary purpose of this task is to conduct an analysis of biodiversity in compliance with Section 119 of the FAA of 1961, as amended, and [ADS guidelines](#). The analysis will inform USAID/Jordan in the development and implementation of its CDCS. USAID’s approach to development requires that the Agency examine cross-sector linkages and opportunities to

ensure a robust development hypothesis. Biodiversity conservation is a critical component in achieving self-reliance and should be considered in mission strategic approaches to improve development outcomes. The analysis therefore can define opportunities to integrate biodiversity conservation into priority development sectors to support the journey to self-reliance.

Climate change is a global concern. As such, the analysis will evaluate the threat to the country's biodiversity from climate change as appropriate. In addition to evaluating the climate change threat to biodiversity, the analysis team should consider climate change as a cross-cutting theme and should analyze and incorporate it, as appropriate, throughout the report. Climate vulnerabilities should also be considered when developing the report's recommendations. The analysis team should identify innovative, integrated strategic approaches that link biodiversity conservation to all USAID programming sectors, and, as appropriate, to climate change.

The analysis team should use mission reports on climate change in the analysis and other reference documents that have been provided via the Jordan 119 Google Folder. The team should also review other sources of climate information available such as the World Bank Climate Change Knowledge Portal and the United Nations Climate Change website.

1.3 MISSION PROGRAM

USAID/Jordan is in the process of developing a new CDCS. That will build on the results attained under the existing CDCS. USAID/Jordan's goal for the 2013 – 2019 CDCS is to improve prosperity, accountability, and equality for a stable, democratic Jordan. This goal will be achieved through the following three development objectives (DOs) and a special development objective (SDO):

- DO 1: Broad-based, inclusive economic development accelerated
- DO 2: Democratic accountability strengthened
- DO 3: Social sector quality improved
- SDO 4: Gender equality and female empowerment enhanced

The above four objectives are inextricably linked to better address the interconnected development challenges facing Jordan and to increase the country's prospects for long-term stability and prosperity. Water, energy, and economic growth programs will link demand management approaches and conservation to more sustainable strategies for economic development. Helping slow down Jordan's rapid population growth rates will enable the government to provide better services for its population and protect Jordan's scarce natural resources. Improvements in education will equip Jordan's youth with employability and life skills, thus better preparing them for work opportunities and for becoming more productive members of their communities. Improving private-sector responsiveness and export competitiveness, while creating jobs and enhancing workforce preparedness, will spur economic growth, especially for disadvantaged populations. Enhancing political participation, improving election administration, and strengthening civil society and judicial independence will raise

public confidence in government accountability. And, pursuing more effective investments in gender equality and female empowerment will accelerate progress in development. Finally, it must be acknowledged that the Syrian refugee crisis has impacted Jordan's resources and public services, and that USAID will continue to support the GOJ as communities within the Kingdom host refugees.

More detailed information refer can be found in the full [CDCS](#) and at USAID/Jordan's [website](#).

2. STATEMENT OF WORK

To achieve the above-stated purpose, USAID/Jordan will mobilize a team composed of Jefferson Science Fellow (Team Leader) and three USAID/Jordan mission staff. The team, under the direction of the Team Leader, will proceed as described in this section. As described herein, the analysis is based on synthesis and analysis of existing information, coupled with key stakeholder consultations and site visits to ground-truth information. The analysis will not generate original primary data.

2.1 PRE-FIELD WORK ACTIONS

2.1.1 DESK-BASED DATA COLLECTION AND ANALYSIS

Gather and begin to analyze existing information to identify biodiversity status, key biodiversity issues, stakeholders, policy and institutional frameworks and gaps in the available information. Reports and other documentation to be reviewed include previous 119 analysis, current CDCS and project documents, information available online (websites of government ministries) on biodiversity conservation, project reports and evaluations, the National Biodiversity Strategy and Action Plan (NBSAP) and the National State of the Environment Report (NSOER).

2.1.2 PLANNING AND LOGISTICAL PREPARATIONS

Note: Activities described in this Section may occur prior to, or in parallel with, activities described in Section 2.1.1.

1. **Organize weekly planning meetings with the mission.** To support the planning and logistic preparations such as sites to visit, lodging and in-country travel, key informants, work plan development, key informant interview protocols, and political or other sensitivities, the team should plan weekly meetings ahead of in-country arrival. See Section 2.2 for further details and topics for the pre-field work meetings.

2. **Plan site visits.** In coordination with the mission, begin planning site visits based on the mission's recommendations and the team's preliminary review of key topics and information gaps. Site visits are meant for primary data collection and should be selected to supplement information gathered from consultations, literature review and other second-hand sources. *Site visit locations should be finalized at least two (2) weeks prior to in-country fieldwork to allow enough time for logistical preparations.*

3. Develop and submit draft work plan. The team will work jointly to draft the work plan which will include a schedule of tasks and milestones, proposed assessment tools, and a brief discussion of information gaps. The draft work plan will also include a preliminary:

- a. List of the type of information to be obtained through further desk research and through consultations.
- b. Mapping of the key people to engage throughout the analysis process, i.e., US-based (predominantly Washington D.C.) stakeholders; mission staff, including the program office, all sector technical staff, and the deputy and mission director; implementing partners; and other key in-country stakeholders, (e.g., organizations, government bodies, the private sector and individuals knowledgeable about and/or implementing projects on environment, biodiversity and tropical forest conservation and other sectors relevant to tropical forest and biodiversity conservation, such as agriculture, economic growth, health, climate change and governance).
- c. Itinerary for in-country consultations and site visits, based upon information made available by the mission regarding geographies of existing programming, areas of known concern, and areas being considered for future programming.
- d. Key informant interview guides to be used for US-based and in-country stakeholder consultations.
- e. Report outline based on the outline included in *Annex B: Analysis Report Annotated Outline in the FAA 118/119 Best Practices Guide*, with differences noted and explained.
- f. Schedule for written progress reports, or calls (with written call/meeting notes) between the Team Leader and the Jordan-based staff, starting from the commencement date and bi-weekly thereafter during the pre-field and field segments.

4. Revise work plan. The team will jointly revise and finalize the work plan prior to the start of the in-country visit.

2.2 MISSION AND FIELD CONSULTATIONS AND SITE VISITS

After arrival in-country, the team will:

- 1. Conduct In-Brief Meetings** with the FO, Program Office (PRO), the Regional Legal Officer (RLO), and other relevant mission staff to (1) review approach, (2) ensure there are no concerns or new developments before the analysis begins, (3) understand the mission's planned timeline for new CDCS development, and (4) discuss status of the new CDCS development/results framework and anticipated changes to overarching strategic goals and/or development objectives, to the extent they are known at the time of fieldwork.
- 2. Meet (separately) with all mission technical teams to:**

- Refine understanding of current programming (geographic areas of focus, earmarks and related mandates or constraints).
- Learn about planned or potential future programming or strategic orientation.

2. Meet with stakeholders and undertake site visits identified in the work plan

3. **Conduct Exit Briefing:** Prior to departure, conduct an exit briefing with the mission, including mission management, program office and technical teams representatives, to provide them with an overview of the analysis and preliminary report findings (Deliverable 1).

2.3 PREPARATION OF THE FAA 119 ANALYSIS

1. **Prepare and submit draft report** (Deliverable 2) The team leader will analyze the information gathered and will prepare a draft analysis report in accordance with the outline attached to the SOW and responsive to the legislative requirements listed in Section 1.1 above. The report will:
 - a. Follow the outline and include the information recommended in Annex B of the [FAA 118/119 Best Practices Guide](#).
 - b. Be between 25-45 pages (excluding annexes), and submitted for review by USAID.
 - c. Copy edited, formatted, and comply with USAID branding requirements

The mission review period for draft report will be 15 working days. The mission should send the analysis report to the relevant regional bureau and pillar bureau staff in Washington for their review and concurrence.

2. **Submit revised report** (Deliverable 3) Following receipt of USAID comments on the draft report, the analysis team leader will prepare and submit a final analysis within 10 working days that incorporates USAID comments. The mission may review and provide comments on Deliverable 3 until the analysis is considered final and sufficient.

3. SCHEDULE AND LOGISTICS

The assignment is expected to last (14) weeks from the commencement date to submission of the final deliverable (deliverable 3). This includes (4) weeks of preparations, (2) weeks of in-country field work, (2) weeks to produce the draft report following in-country work, (3) weeks for USAID review of the draft report, and (2) weeks to produce the final report.

Table 1: Weekly activities and milestones

Week	Activity/Milestone	Comments
Week 1-4	Desk review and analysis of available studies and reports	start date: 14 April
Week 5	Field work and meetings in Jordan	Deliverable 1: 16 May debrief with Mission
Week 7-8	Prepare the draft report	Deliverable 2: submit by 6 June
Week 9-11	Review the draft report by USAID/Jordan	Includes review by REA and BEO
Week 12-14	Prepare the final report	Deliverable 3: submit by 21 July

4. DELIVERABLES

The following are the deliverables for this task:

- Deliverable 1.** Exit briefing, finalize all field notes, and identify areas that need further desk review or remote follow up.
- Deliverable 2.** Draft FAA 119 analysis report, conforming to all requirements specified in section 2.3 submitted 15 working days after the conclusion of in-country work.
- Deliverable 3.** Final report incorporating all comments, conforming to all requirements specified in section 2.3 submitted within 15 working days of the receipt of all USAID review comments on the draft analysis.

5. ROLE OF THE ANALYSIS TEAM

The analysis team shall include a Team Leader and three staff from USAID/Jordan mission as follows:

- Peter Smallwood, Jefferson Science Fellow, Team Leader
- Dani Newcomb, Water Resources Officer
- Farid Musmar, Climate Integration Lead
- Haithem Ali, Mission Environmental Officer

USAID/Jordan will be substantially involved in the completion of the analysis, but the analysis will be led by the Team Leader. The Team Leader will lead all components of the analysis and be responsible for drafting of all deliverables. USAID/Jordan team members will provide feedback, input, and are available as resources. USAID/Jordan team members will set up all meetings for the in-country portion of the trip, accompany the Team Leader during the

interviews and meetings, and provide background materials. The Team Leader will provide input to the rest of the team to ensure that stakeholder meetings and planned visits are sufficient to complete the deliverables. The Team Leader will be responsible to compile and record notes and documentation of the meetings, but the rest of the team is available to assist or to help clarify discrepancies in the gathered information.

Upon submission of each Deliverable, USAID/Jordan will facilitate sharing with other relevant parties, such as the REA and BEO, and provide consolidated comments to the Team Leader who will be responsible for any required revisions. The Team Leader and the team will maintain weekly contact via phone or email once the in-country visit is completed, until the analysis is complete and approved.

Annex B: Persons Interviewed

Name	Title	Additional Titles or Expertise	Email Addresses
Dr. Ehab Eid	Exec. Director JREDS (Jordan Royal Society for Marine Conservation)	IUCN Steering committee: CITES expert	e.eid@jreds.org
Dr. Nedal M. Al-Ouran	UNDP, Head of Environment, Climate change, and DDR portfolio		nedal.alouran@undp.org
Eng. Anas Khasawneh	GEF/UNDP Small Grant Program National Coordinator		Anas.Khasawneh@undp.org
Eng. Raed Banihani	MoEnv, Director of Nature Protection Directorate	CBD National Focal Point	ra_banihani@yahoo.com
Eng. Belal Qtishat	MoEnv, Head of Biodiversity Section		
Dr. Ahmad Obaidat	MoEnv, Director of Department of Outreach		
Ahmed Al-Amra	Country Rep for Global Green Growth Institute (housed at MoEnv)		ahmed.amra@gggi.org
Dr. Jihad Alswawair	MoEnvR, technical advisor to the Minister, Director of the Green Economy Unit		jihad.alsawair@moenv.gov.jo
Dr. Oliver Schlein	Project Coordinator, GIZ Jordan Env. & Climate Portfolio, and Sustainable use of ecosystems-Jordan		oliver.schlein@giz.de
Omar Shoshan	Chair of the largest of three associations of environmental NGOs working with MoEnv		Omar.Shoshan11@gmail.com
Tariq Abu Taleb	Exec. Director, Royal Botanical Garden		tabutaleb@royalbotanicgarden.org
Mustafa Shdaifat	Site Manager, Royal Botanical Garden		
Dr. Nizar Jamal Haddad	Director General, National Agricultural Research Centre, MoA		director@narc.gov.jo
Dr. Khaled Abu Laila	Director of Biodiversity Directorate, National Agricultural Research Center, MoA	Plant biodiversity expert, Seed Bank and Herbarium Curator	kabulaila@gmail.com
Yehya Khaled	Director General, Royal Society for the Conservation of Nature		Yehya.Khaled@rscn.org.jo

Name	Title	Additional Titles or Expertise	Email Addresses
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Annex C: Analysis Team

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