جمهورية العراق

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SIXTH NATIONAL REPORT OF IRAQ

TO THE CONVENTION ON BIOLOGICAL DIVERSITY

December 2018

Convention on Biological Diversity

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Messages from the Minister of Health and Environmen

Iraq has a geographically diverse environment of high mountains, plains, valleys, desert lands, plateaus, water fountain, rivers, marshes and lakes. It possesses a unique nature as an economic resource of the country. In contrast, it faces great burdens, challenges and enormous future environmental problems. The war and its aftermath and the terrorist operations that Iraq has faced during the past period are a heavy legacy and challenges that have caused environmental problems, as well as the unsustainable use of natural resources, decline of green areas and the expansion of decertified land, insufficient capacity for waste management, water and air pollution and global warming impacts. Therefore, we have been assigned the duty to protect and sustain the Iraqi environment and make the priority given to environment challenges.

Addressing these challenges has become part of the plans and development of the Iraqi's strategy for the environment. We have shown strong interest and commitment to environmental issues and relevant international conventions through the preparation of reports, annual plans for environmental protection and appropriate solutions to address the problem of biodiversity loss and habitat rehabilitation through the expansion of protected areas and the protection of threatened species,

In addition to the enactment of legislation that prevents several types of encroachment on habitats. The launch of the sixth national biodiversity report is a step towards assessing the national environmental reality of biodiversity, as this report is the result of the implementation of the National Biodiversity Strategy programs (2015-2020) implemented by stakeholders, aimed at providing the required support to institutions to protect ecosystems and biodiversity and develop appropriate solutions to environmental challenges.

Dr. Ala Aldin Alwan

The Minister of Health and Environment

December 2018

Preface by the Technical Deputy of the Environmental Affairs - National Focal Point of the Convention on Biological Diversity

Iraq's commitment to fulfilling its responsibilities to the Convention on Biological Diversity, and in recognition of the importance of the Convention on Biological Diversity, the National and Global Strategic Plan for the Conservation of Biodiversity and the Aichi Biodiversity Targets, the Sixth Biodiversity Report has been completed by national efforts from the Ministry of Health and Environment with other related Ministries and agencies by the technical support from the United Nations Development Program (UNDP) and funded by the Global Environment Facility.

The Ministry of Environment has worked hard and is committed to meeting the timetable set by the Secretariat of the Convention on Biological Diversity by mobilizing all resources for this task. The implementation of this report is in line with the implementation of the Global Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets to be discussed during COP 15 in 2020. This report provides an opportunity for us to assess what has been done by the Ministry of health and Environment with relevant institutions in the area of biodiversity conservation during the years since the implementation of the national strategy)2020-2015(

It is therefore necessary to identify weaknesses and take action to overcome them. In the last phase of the preparation of this report, a workshop was held to review what has been approved since the start of the project in addition to the urgent need to fill the technical gaps in the report and finally for the purpose of completing the report in a technical manner competing with the rest of the parties and considered an environmental message to the decision makers to provide protection and Support needed to protect biodiversity, As we need to achieve national participation with all existing partners to describe and evaluate the national effort in preparing this report as one of the most important tools that can be used to assess achievement in achieving the national biodiversity protection goals contained in the National Biodiversity Strategy. This valuable technical report is therefore a step towards the assessment of biodiversity in Iraq, in which we hope to enhance the capacity of biodiversity conservation professionals at the international and regional levels. Finally, I would like to thank all participants in the preparation of this report, in addition to our high appreciation to the United Nations Development Program (UNDP). I ask God for all success and good service in this country.

Dr. Jassim Abdul Aziz Al Falahi

Technical Deputy of the Environmental affairs
Ministry of Health and Environment

December 2018

The sixth national report has been prepared as a result of the project entitled “Technical support to Eligible Parties to Produce the Sixth National Report to the Convention on Biological Diversity” with funding by the Global Environment Facility.

The preparation process of this report has been led by Dr Jassim Al Falahi, the Technical Deputy for Environmental affairs in Ministry of Health and Environment, and Convention on Biological Diversity national focal point.

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Mr. Anam Thabit Khalil	Mr. Hadi Hashim Hussein
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1- Department of chemicals monitoring and contaminated sites assessment.
2- Department of Industrial and services activities monitoring and assessment.
3- Department of water and soil monitoring

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Nature Iraq organization for the Key Biodiversity Areas of Iraq report (KBA), which is considered one of the main sources for the Sixth National Report.

Executive Summary

Environmental protection and human health are top priorities within Iraqi policy. The Iraqi law for protecting and improving the environment No. 27 of 2009 aims to protect and improve the environment, natural resources, biodiversity, cultural and natural heritage in cooperation with the related authorities to ensure sustainable development.

At the end of July 2009, Iraq deposited its instrument of accession to the Convention on Biological Diversity (CBD) with the Secretary General of the United Nations, and on the 26th October of 2009 became the 192nd Party to the Convention. Parties are required by Article 26 of the Convention to submit national reports to the COP on measures taken to implement it, and the effectiveness of those actions in meeting the Convention's objectives, based on that the Iraqi's Fourth and Fifth National Reports to the Convention on Biological Diversity were issued respectively in July 2010 and in March 2014.

The sixth National Report (6NR) in Iraq was prepared in accordance with the guidelines for the 6NR development (issued by the Secretariat of the Convention on Biological Diversity). The 6NR was completed with logistical and financial support from the Global Environment Facility (GEF) and technical support from the United Nations Development Program (UNDP). The Ministry of Health and Environment (CBD focal point) and related Ministries and Institutions in the federal government and Kurdistan region developed a high-quality, data-driven report. The report has been prepared following the consultative processes recommended and with participation of relevant ministries and agencies, lead specialists in the field of biodiversity, representatives of academia, and NGOs.

The 6NR contains a final review of results achieved through the implementation of the National Biodiversity Strategy and Action Plan in Iraq NBSAP (2015-2020). This strategy presents 23 strategic National Biodiversity targets and 34 actions defined for a 5 years period. All actions are categorized into five focal areas of action: 1. awareness of biodiversity (with associated benefits) and traditional knowledge; 2. policy associated with wildlife (including legislation); 3. protected areas and actions for the conservation of habitats and species; 4. monitoring and assessment; and 5. training.

The 6NR contains five mandatory sections. Section I includes information collected on 23 targets sought at the national level. Section II includes measures for the implementation of National Biodiversity Strategy and Action Plans adopted and their effectiveness, related constraints and scientific and technical needs. Section III includes an assessment of progress towards each national target, the fourth section IV describes the national contribution to achieving each of the Aichi Biodiversity Targets. Section V describes achievements towards the Global Strategy for Plant Conservation. Section VI provides additional information on the contributions of indigenous peoples and local communities. Finally, Section VII includes an update of the national biodiversity profile. A final part describes the stakeholder's engagement process used throughout the 6th National Report and is relevant to the information presented throughout.

Sixth National Reports are considered a key tool to achieve biodiversity conservation and sustainable development across large parts of the world. The 6NRs allow the Conference of Parties to monitor the implementation of the Convention providing materials for the preparation of the regular Global Biodiversity Outlook and the Global Biodiversity Strategy of 2021-2030.

The review will take place at the 15th meeting of the Conference of Parties in 2020 by issuing the Fifth Global Biodiversity Outlook and conducting the corresponding analysis. The information provided in the Sixth National Reports will be used for the development of subsequent activities in the field of biodiversity conservation for the period after the year 2020.

Iraq has witnessed significant political, economic and security incidents in the years following adoption of the NBSAP (2015-2020). Despite the lack of funding in the implementation of the NBSAP and the deteriorating security conditions in some areas of Iraq since the fifth National Report, but the implementation has continued. The main constraints of implementation were linked to financial, administrative and legal issues that impacted on the field work needed to update information about the state of ecosystems, habitats and species. These issues have also influenced the progress in ratification of legislation needed to complete the recommended actions from the NBSAP.
As the period of the current strategy draws to a close, it is still being updated to build on new information on biodiversity, the challenges and lessons learned from the outcomes of the implementation of the current strategy.

Biodiversity awareness and traditional knowledge: The achievements from the implementation of the NBSAP include: increases in awareness about biodiversity through training courses, workshops and conferences targeted at key stakeholders (e.g. governmental entities), evidence from surveys sampled the knowledge and awareness of biodiversity amongst a range of actors including governmental employees and students in universities (with gender consideration),the results showed variation in the understanding across different areas of biodiversity (rates of understanding were low about ecotourism, ecosystem services and National Parks among university students; and low rates of understanding about habitat loss and endangered/threatened species among government employees; understanding was also low amongst the wider public, in both urban and rural areas, related to water scarcity and its impacts on human life. Awareness tools are also described including publications and video presentations about biodiversity, information published on websites and on social media. Case studies about traditional knowledge are presented, for example, focused on women within the Iraqi Marshes.

Legislation to protect biodiversity: The 6NR also described the most important legislation for the protection of biological diversity. A key example included the issuance of a Protected Areas Law No 2 of 2014, to identify and approve protected areas in Iraq. There are five protected areas already ratified including the World Heritage site of the Iraqi Marshes. In addition, 18 protected areas were proposed through a vote of the National Commission for protected areas.

Legislation was also drafted on the control of alien and invasive species, protection of endangered species, reduction of desertification, the regulation on environmental tourism in natural sites (including World Heritage properties). All these laws are in the process of final adoption.

Other legislation was focused on aquaculture. Two instructions were issued: (i) for the control of fish breeding by using water ponds and floating cages on 2014 and 2015 respectively, to encourage fish production and reduce the pressures on the native fish species in water ecosystem; and (ii) on hunting Instructions in Marshlands No. 2 of 2017, to ensure biodiversity conservation in this vital area.

The Republic of Iraq ratified to Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) on 2016. Iraq is a signatory state of the Convention of Migratory Species and wild animals (CMS), Law No. 29 of 2016 was issued based on that.
Ecosystem services are reported as a list of those provided by natural ecosystems used by people in rural and urban areas.

Protected areas: Brief details of legislation ratified or currently in the process of ratification are described above. However, the total land area protected as of April 2019 covers only 1.53% of Iraq. To expand the Protected areas network, a major project was undertaken by a working group from the Ministry of Health and Environment in cooperation with Nature Iraq (NGO). This project surveyed 82 key biodiversity sites in Iraq and was reported in a document in 2017. The surveys covered a wide range of information on biodiversity and site characteristics including threats to each site and these are presented in maps. The report also presented updated information on the forest areas in Iraq including the Kurdistan region which is the home to the largest area of forest. Forest loss was reported spatially and the major pressures that caused it were described.

Monitoring and assessment: An updated list of invasive species in Iraq was included in the 6NR which was amended based on new information (e.g. research) and expert opinion. Ecosystem services and their value were outlined in the 6NR, details of the network of water and air quality monitoring stations are included and the results from studies of both key services.

The report described in a separate chapter the national contributions to 20 Global targets (Aichi Targets) and included an updated biodiversity country profile for Iraq. Biodiversity is integrated into many national strategies and plans like the National Strategy of Environment, Poverty Reduction Strategy, water resources, agriculture and power strategies and into development plans. National/Global biodiversity targets were linked to the sustainable development goals (SDGs) in a separate section. The 6NR to the CBD has been discussed and adopted by the national authorities, representing relevant stakeholders.

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Acronyms and Abbreviations

ABT	Aichi Biodiversity Targets
AVJCF	Aage V. Jensen Charity Foundation
BAFs	Bioaccumulation factors from sediment
BAFw	Bioaccumulation factors from water
BCF	Bioconcentration factor
BRAC	Building Resilience of the Agriculture Sector to Climate Change in Iraq
CBD	Convention on Biological Diversity
CMS	Convention of Migratory Species
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
EPIB	Environmental Protection and Improvement Board
EPPO	European Plant Protection Organization
ETM+	Enhanced Thematic Mapper
FAO	Food and Agriculture Organization
GCA	General Customs Authority
GEF	Global Environmental Facility
GIS	Geographic Information System
GMOs	Genetically Modified Organisms
GOI	Government of Iraq
GRIIS	Global Register of Introduced and Invasive Species
GSDG	Committee od SDGs in Governorates
IBA	Important Bird Area
IGCO	Iraqi Green Climate Organization
I-GEO	Biogeochemical index
ISIS	Islamic State in Iraq and Syria
IMA	Iraqi Media Authority
IMN	Iraqi Media Network
INC	Initial National Communication
iNDC	Iraq's Nationally Determined Contributions
IPA	Important Plant Area
IPBES	Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services
ISSG	Invasive Species Specialist Group
IUCN	International Union for Conservation of Nature
KAP	Knowledge, Attitude and Practice
KBA	Key Biodiversity Area
KRG	Kurdistan Regional Government
MEMAC	Mutual Assistance for Maritime Emergency
MoA	Ministry of Agriculture
MoC	Ministry of Culture
MODIS	Moderate Resolution Imaging Spectroradiometer
MoE	Ministry of Education
MoFE	Ministry of Finance and Economy
MoHEnv	Ministry of Health and Environment
MoHESR	Ministry of Higher Education and Scientific Research
MoI	Ministry of Transport
MoIA	Ministry of Interior Affairs
MoP	Ministry of Planning
MoT	Ministry of Trade
MoTA	Ministry of Tourism and Antiquities
MoWR	Ministry of Water Resources
MoAWR	Ministry of Agriculture and Water Resources
MSMNED	Marshland and Sustainable management of natural ecosystem department
NBSAP	National Biodiversity Strategy and Action Plan
NBTs	National Biodiversity Targets
NC-NPA	National Committee of the Natural Protected Areas

NDP	National Development Plan
NESAP	National Environmental Strategy and Action Plan
NGOs	Non-Governmental Organizations
NI	Nature Iraq
NP	National Park
NSPE	National Strategy on Poverty Eradication
OIE	World Organization for Animal Health
OSRP	Oil Spill Response Plan
PA	Protected Area
PLI	Pollution load index
PSR	Pressure-State-Response
PWHF	Persian Wildlife Heritage Foundation
ROPME	Regional Organization for Protection of Marine Environment
SDGs	Sustainable Development Goals
SSAP	Single Species Action Plans
TDS	Total dissolved solids
TESSA	The Toolkit for Ecosystem Services Site-Based Assessment
TK	Traditional knowledge
TSP	Total suspended particles
UNDCC	United Nations Convention to Combat Desertification.
UN-Environment	United Nations Environment Program
UNFCCC	UN Framework Convention on Climate Change
WHO	World Health Organization

Section I. Information on the Targets being pursued at the National Level

National Biodiversity Target 1 (NBT1): By 2020, 25% of urban and rural people have awareness of the status of biodiversity, its benefits for people, the pressures that affect it, and the actions they can take for its conservation and sustainable use.

Rationale for the national target

This target aims to achieve a better knowledge about biodiversity and its importance for the well-being of people, it involves consistent nationwide promotion and education efforts to build public consensus and raise awareness of the importance of biodiversity conservation, the sustainable of biological resources and of the actions they can take to conserve and use it sustainably, which in turn enhances the conditions for securing biodiversity for the future.

This target set a deadline of 2020 to raise awareness about biodiversity for at least 25% of urban and rural populations in Iraq. The awareness about biodiversity in a sample of the urban and rural population must be assessed with robust sampling in order to assess the 25% threshold that will allow meeting the target.

There is a need to understand the current levels of biodiversity awareness and develop and implement effective and targeted communication plans that explain the diverse values of nature.

Level of application

☒National/federal
☒ Subnational – KRG

Relevance of the national targets to the Aichi Biodiversity Targets
Main related Aichi Biodiversity Targets

☒ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

ABT 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably. Addressing the direct and underlying drivers of biodiversity loss will ultimately require behavioural changes by individuals, organizations and governments.

Other related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐12	☐ 17
☐ 3	☐ 8	☐ 13	☒ 18
☐ 4	☐ 9	☐ 14	☒ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

This target is based on the importance of raising the level of awareness of environmental issues to society, establishing a sense of individual and collective responsibility for preserving and improving biodiversity. In

addition, the target encourages national voluntary efforts to preserve biological diversity and catalyses the role of the media in educating members of society about the need to care for the environment. Understanding gender

differentiated biodiversity practices could potentially enhance conservation as well as the evidence needed to ensure future equality. Biodiversity conservation efforts become more effective and efficient when women and vulnerable groups are empowered to participate as equals (examples of tasks and actions: information sharing and generation; education and training; technology transfer; organizational development; financial assistance; policy development). If gender is not taken into consideration, this will risk an increase in the loss of biodiversity, due to mismanagement and unsustainable use, and the loss of important traditional knowledge, skills and experiences.

Among men and women, biodiversity is closely connected to development, access to resources, income-generating activities, food, and essential household products, from this perspective, the disciplines of biodiversity and gender overlap and are clearly linked.

Stakeholders involved in this target are Governmental institutions from national and local levels and a range of, non-governmental associations are as follows:

MoHEnv, MoHESR, MoE, MoC, IMN, MoAg, MoWR, MoP, Governments Councils, KRG/EPIB, NGOs.

Strategies and Plans in which this national target has been included:
Environmental awareness is included in the NESAP (2013-2017) in a wide range of perspectives and in the main strategic goals namely: (i) protection and sustainable use of biodiversity; (ii) development of an institutional and legal frame work in the environmental sector which includes increased awareness; (iii) many planned programs to increase environmental awareness in other areas like air pollution, climate change and desertification.

Relevant websites, web links, and files

- *NESAP (2013-2017). Pdf*

http://www.moen.gov.iq /6NR/strategies and plans

National Biodiversity Target 2 (NBT 2): By 2020, 50% of policy makers and planners have awareness of the status of biodiversity, its benefits for people, the pressures that affect it, and the actions they can take for its conservation and sustainable use.

Rationale for the national target

This objective aims to target policy makers, planners and officials to better understand the biodiversity and its importance to people's well-being. The threshold of 50% (higher than for the general public) has been set to signify that the level of awareness on biodiversity issues by those people influencing the future economic development of the country must reach much higher standards because their actions are crucial to achieving rapid change in natural resource management. These officials in the government are categorised as “drivers of change”. They will have the potential to mainstream biodiversity in the relevant Ministries’ plans and strategies to promote sustainable environment management and economic development.

Engagement by decision makers from the ministries responsible for the environment and biodiversity management can be achieved through capacity building (e.g. training, workshops, etc.), which will lay the foundation for change in the understanding of the value of biodiversity and the solutions to ensure effective conservation and sustainable use.

Level of application

☒National/federal
☒ Subnational – KRG

Relevance of the national targets to the Aichi Biodiversity Targets
Main related Aichi Biodiversity Targets

☒ 1 ☐ 6 ☐ 11 ☐ 16
☐ 2 ☐ 7 ☐ 12 ☐ 17
☐ 3 ☐ 8 ☐ 13 ☐ 18
☐ 4 ☐ 9 ☐ 14 ☐ 19
☐ 5 ☐ 10 ☐ 15 ☐ 20

ABT 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably. Addressing the direct and underlying drivers of biodiversity loss will ultimately require behavioural changes by individuals, organizations and governments.

Other related Aichi Biodiversity Targets

☒ 1 ☐ 6 ☐ 11 ☐ 16
☐ 2 ☐ 7 ☒ 12 ☐ 17
☐ 3 ☒ 8 ☐ 13 ☐ 18
☐ 4 ☐ 9 ☐ 14 ☐ 19
☐ 5 ☐ 10 ☐ 15 ☐ 20

Other relevant information

Stakeholders involved in this target:
All Ministries in Federal Government and KRG related Ministries.

Strategies and Plans in which this national target has been included:
Refer to NBT1

National Biodiversity Target 3 (NBT 3): By the end of 2015, a national survey of tools used for public awareness of biodiversity is completed.

Rationale for the national target

In order to ensure effective management of biodiversity people need awareness of the values of biodiversity and the steps they can take to conserve and use it sustainably. Addressing the direct and underlying drivers of

biodiversity loss will ultimately require behavioural changes by individuals, organizations and governments. In order to plan for a programme that addresses this gap, there is a need for production of various communication

tools that are effective and target oriented. There is a need to conduct a comprehensive review of all available awareness tools used by related institutions including media and NGOs to disseminate information on biodiversity.

NESAP (2013-2017) referred to component IV on environmental awareness and education related to modern technologies of communications as a strategic goal.

Level of application

☒National/federal
☒ Subnational – KRG

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☒ 1 ☐ 6 ☐ 11 ☐ 16
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ABT 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably. Addressing the direct and underlying drivers of biodiversity loss will ultimately require behavioural changes by individuals, organizations and governments.

Other related Aichi Biodiversity Targets

☐ 1 ☐ 6 ☐ 11 ☐ 16
☐ 2 ☐ 7 ☐ 12 ☐ 17
☐ 3 ☐ 8 ☐ 13 ☒ 18
☐ 4 ☐ 9 ☐ 14 ☒ 19
☐ 5 ☐ 10 ☐ 15 ☐ 20

Other relevant information

Stakeholders involved in implementing this target:
MoHEnv, MoC, MoWR, MoHESR, MoE, KRG, IMN, NGOs

Strategies and Plans in which this national target has been included:
Refer to NBT1

National Biodiversity Target 4 (NBT 4): By 2020 the use of tools (films, publications, educational programmes, guidance materials, and training) for raising awareness of biodiversity is improved with locally defined, area based and targeted awareness programs (e.g. governorate level).

Rationale for the national target

Increasing knowledge in environmental sciences plays a crucial role in the future of society. Therefore, improving the means of awareness of the environment will contribute effectively to increasing knowledge for a sustainable future society. In order to develop an effective action plan for raising awareness, the programs have to be specifically tailored to the needs and target people, therefore context-dependent tools are important in achieving effective action.

Level of application

☒National/federal
☒ Subnational – KRG

Relevance of the national targets to the Aichi Biodiversity Targets
Main related Aichi Biodiversity Targets

☒ 1 ☐ 6 ☐ 11 ☐ 16
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☐ 5 ☐ 10 ☐ 15 ☐ 20

ABT 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably. Addressing the direct and underlying drivers of biodiversity loss will ultimately require behavioural changes by individuals, organizations and governments.

Other related Aichi Biodiversity Targets

☐ 1 ☐ 6 ☐ 11 ☐ 16
☐ 2 ☐ 7 ☐ 12 ☐ 17
☐ 3 ☐ 8 ☐ 13 ☒ 18
☐ 4 ☐ 9 ☒ 14 ☐ 19
☒ 5 ☐ 10 ☐ 15 ☐ 20

Other relevant information

Stakeholders engaged with the implementation of this target:
MoHEnv, MoC, MoHESR, MoA, MoE, KRG, IMA, NGOs

Strategies and Plans in which this national target has been included:
Refer to NBT1.

National Biodiversity Target 5 (NBT 5): By the end of 2020, produce a GIS database of the extent, condition (i.e. healthy or degraded) and protection status of the natural (not altered by human intervention), semi-natural and human modified habitats of Iraq has been developed.

Rationale for the national target

Sustainable long-term functioning ecosystems in Iraq require urgent action to conserve, protect and restore high quality habitats and to reduce the multiple pressures on them. NBT 5 was designed in order to aid progress in positive management for the natural environment in Iraq. The GIS database is aimed at enabling multiple different metrics to be compared across the same land area in order to make informed management and policy decisions.
The aim is to include threats and protection status of habitats within the geographic information system which will facilitate the monitoring of the assessment of the rate of loss and degradation. This goal will help those interested in acquiring technical skills to create and maintain the geographical database.
Level of application:

☒ National/federal

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1 ☐ 6 ☐ 11 ☐ 16
☐ 2 ☐ 7 ☐ 12 ☐ 17
☐ 3 ☐ 8 ☐ 13 ☐ 18
☐ 4 ☐ 9 ☐ 14 ☐ 19
☒ 5 ☐ 10 ☐ 15 ☐ 20

ABT 5: By 2020, the rate of loss of all-natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

Other related Aichi Biodiversity Targets

☐ 1 ☐ 6 ☒ 11 ☐ 16
☐ 2 ☐ 7 ☐ 12 ☐ 17
☐ 3 ☐ 8 ☐ 13 ☐ 18
☐ 4 ☒ 9 ☐ 14 ☒ 19
☐ 5 ☐ 10 ☐ 15 ☐ 20

Other relevant information

In order to assess the rate of loss and the degradation of the habitats in Iraq, there are key points to address. Habitats in Iraq are not all 'natural' meaning that most of them have been partially or totally modified by human intervention, nevertheless they are providing essential services to people; for this reason, all habitats need to be included in the assessment foreseen by this target. Their extent is relatively easy to be assessed using spatial mapping tools like GIS. However, this necessitates capacity building in Iraq of technological skills in order to build and maintain suitable GIS databases.
Stakeholders involved in this target:
There is a need to involve an array of stakeholders in this target which included: MoHEnv, MoP, MoA, MoWR, Universities and Research Institutions, KRG and NGOs (e.g. Nature Iraq and Iraqi Green Climate Organization).

Strategies and plans for which this national objective has been incorporated:

NDP (2018-2022), chapter 10 on Environmental Sustainability/situation analysis on Biological Diversity

Relevant websites, web links, and files

- *NDP 2018-2022*

https://mop.gov.iq/en/page/view/details?id=88

- *KBA report 2017*

https://www.amazon.com/Key-Biodiversity-Areas-Iraq-Nature/dp/0988651467

National Biodiversity Target 6 (NBT 6): By the end of 2020, the reasons for loss and degradation (i.e. the species that used to be present in that habitat are not there anymore, and the services that the people expected or used are reduced or absent) of each of the natural (not altered by human intervention), semi-natural and human modified habitats of Iraq have been identified to inform conservation actions.

Rationale for the national target

Iraq needs to assess the status, trends and distribution of species and key natural habitats in order to protect the natural capital of the country and the associated ecosystem services that are of benefit to people. An understanding of the drivers of loss and degradation of these species and habitats is needed to guide action (such as policy instruments and land management) to safeguard against further loss and degradation.

Level of application

☒ National/federal

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☒ 5	☐ 10	☐ 15	☐ 20

ABT 5**:** By 2020, the rate of loss of all-natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

Other related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☒ 8	☐ 13	☐ 18
☐ 4	☒ 9	☐ 14	☐ 19
☐ 5	☒ 10	☐ 15	☐ 20

Other relevant information

One starting point for the assessment of threats to biodiversity in Iraq comes from the IUCN Red List of Threatened Species. Six hundred and forty-eight species occurring in Iraq have had the threats to them assessed and the top 10 threats associated with those 648 species are shown in Figure 1-1. The three commonest (identified) major categories of threat come from “Pollution”, “Biological Resource Use ”, and from “Human and Commercial Development”. These categories are those used in the Red List assessment process and it is important to note that multiple threats can be linked to the same species as well as to habitats.

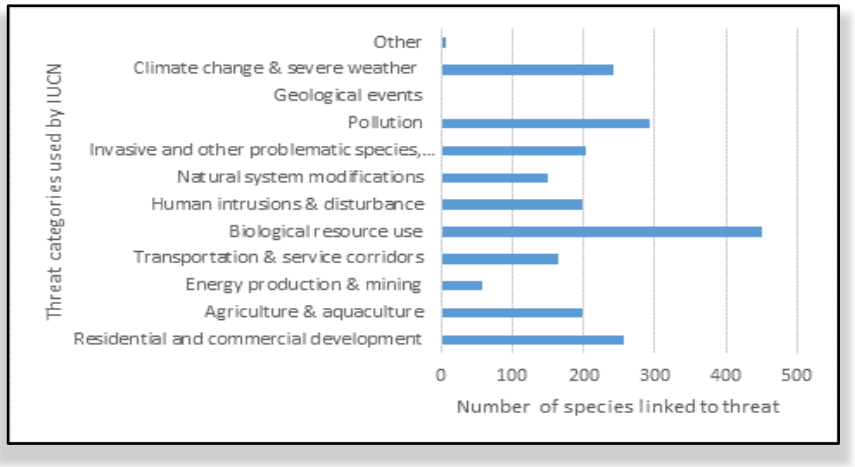

Figure 1-1 Top 10 threats associated with the 648 species for which threats have been assessed on the IUCN Red list

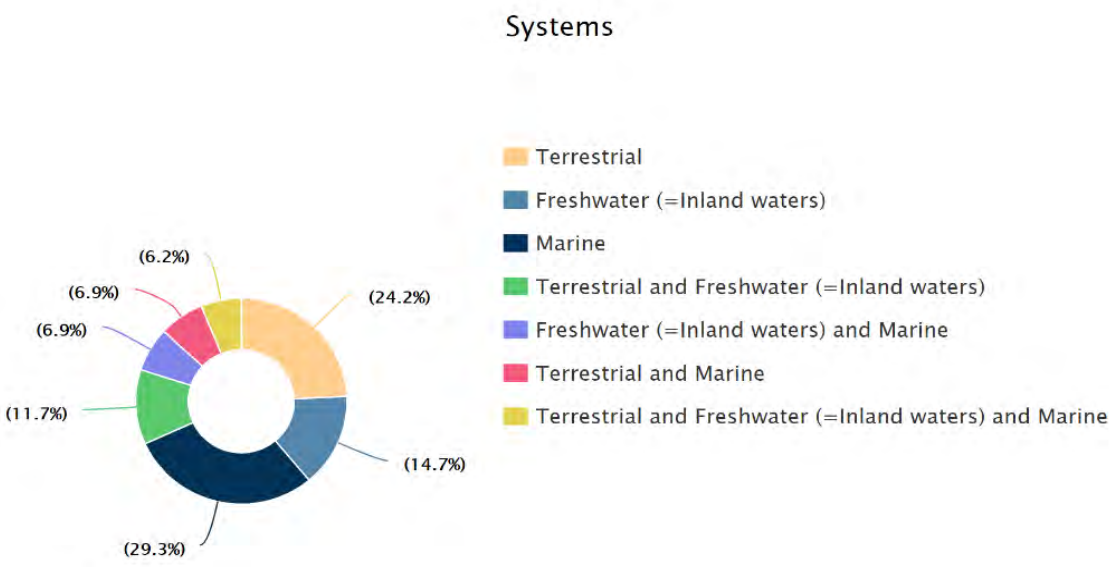

Figure 1-2 Breakdown of the 648 species on the IUCN Red List of Threatened Species in Iraq (data downloaded on 10/04/2019) by habitat.

At a national level, the creation of the target has involved the following stakeholders:
MoHEnv, MoP, MoA, MoWR, MoHESR, KRG, NGOs.

National Biodiversity Target 7 (NBT 7): By the end of 2016, major pressures on forest ecosystems have been identified and studied.

Rationale for the national target

Forests are considered renewable resources that can provide provisioning services for humans and support higher levels of biodiversity than other terrestrial ecosystems. They play an important role in the conservation of natural resources, in addition to the many environmental, social and economic benefits provided by forests (e.g. carbon stores, firewood for cooking, enhanced soil structure relative to unforested slopes). Deforestation is a major driver

in the loss of biological resources and a major contributor to climate change. Forests in Iraq are currently facing several threats such as wind extraction, fires risks, serious forest pests or diseases, damage by livestock and wild animals. Climate change is associated with reductions in annual rainfall rates and therefore increases in drought which threaten forests and increase fire risk.
Some examples of the forest's benefits in Iraq:

- Preserving the aesthetics of nature and the environment is one of the pillars of development and instrumental in the promotion of tourism, which contributes to the national economy.
- Preserving the soil of the lands, mountains and valleys of the Kurdistan region from erosion because of rainfall and floods.
- Provide jobs opportunities for local people through forest investment, like (timber), one of the ecosystem services.

This target aims in the short-term to review the main threats and pressures that the few forest ecosystems of Iraq are suffering. As a first step all the forest ecosystems must be identified and possibly mapped, then through both field and desktop surveys the pressures and threats that are affecting them will be identified, listed and studied (meaning that the drivers of these pressures and the possibilities to remove them also will be identified).

According to statistics of the Ministry of Agriculture and water resources in KRG, 56% of the forests and pastures of the province of Sulaymaniyah have been exposed to fires during the last eight years, and that the largest proportion of fires were located in the province of Halabja *http://www.rudaw.net/arabic/kurdistan/110720184).*

Level of application

☒National/federal
☒ Subnational – Kurdistan Region

Relevance of the national targets to the Aichi Biodiversity Targets
Main related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☒ 5	☐ 10	☐ 15	☐ 20

ABT 5**:** By 2020, the rate of loss of all-natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

Other related Aichi Biodiversity Targets

☒ 1	☐ 6	☐ 11	☐ 16
☐ 2	☒ 7	☐ 12	☐ 17
☐ 3	☒ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

Where are the forests in Iraq?
The distribution of forests in Iraq is focussed in the north and east of the country and is illustrated in Figure 1-3 below.

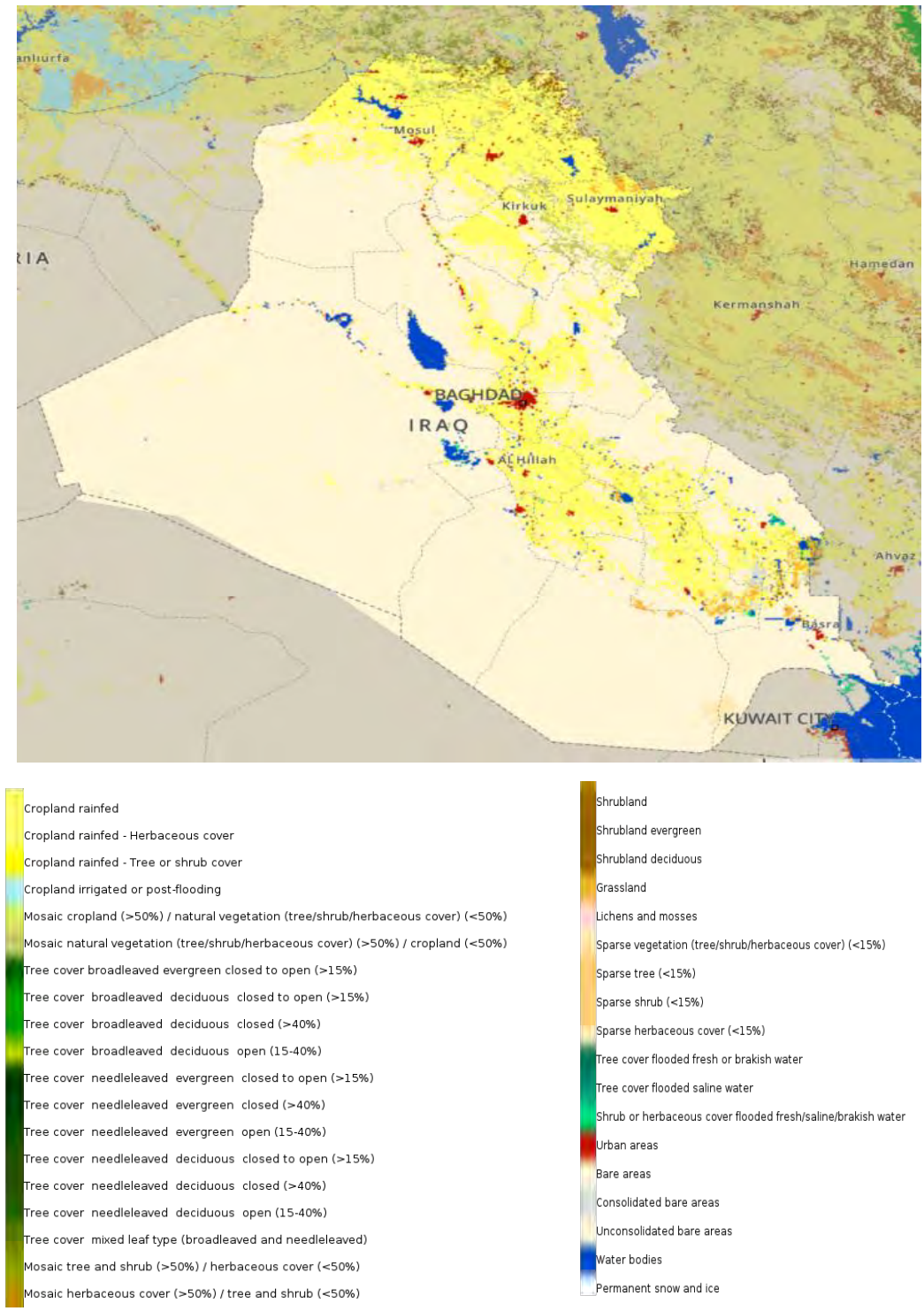

Figure 1-3 The forest cover in Iraq is limited to a small area in parts of the east and north of the country. European Space Agency Climate Change Initiative, Land Cover Project. 2017. 300m Annual Global Land Cover Time Series from 1992 to 2015. Retrieved from http://maps.elie.ucl.ac.be/CCI/viev. Accessed through UN Biodiversity Lab, (05/12/2018). www.unbiodiversity.org.

Main stakeholders involved in this target:
MoHEnv, MoA, MoP, MoHESR, MoWR, KRG, NGOs
Plans and Strategies related to this Target:
NESAP (2013-2017).
NDP (2018-2022).

KRG vision 2020.
MoA strategic plan 2015-2025.

Relevant websites, web links, and files

- *NESAP (2013-2017)*

http://www.moen.gov.iq /6NR/ Strategies and plans

- *KRG vision 2020*

http://cabinet.gov.krd/p/page.aspx?l=12&s=000000&r=409&p=325&h=1&t=0

- *NDP 2018-2022*

https://mop.gov.iq/en/page/view/details?id=88

National Biodiversity Target 8 (NBT 8): By the end of 2020 legislation has been enacted to address major pressures on forest ecosystems and their local species and to promote their sustainable management, restoration and conservation.

Rationale for the national target

One mechanism for the protection of forests, the rationale for this target, is through legislation to protect forests and reduce the threats to them.
The achievement of the target will only involve the issuance of the legislation; however, it is essential that every new legislation act issued, or any review of existing legislation, is carefully monitored both in its implementation and enforcement. The target links directly with two national challenges:

- Addressing the pressures that affect forest ecosystems through the updating of existing legislation.
- Applying protection and enforce the legislation that has been enacted.

Level of application

☒ National/federal
☒ Subnational – Kurdistan regional Government/Iraq

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☒ 5	☐ 10	☐ 15	☐ 20

ABT 5: By 2020, the rate of loss of all-natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

Other related Aichi Biodiversity Targets

☒ 1	☐ 6	☒ 11	☐ 16	
☐ 2	☒ 7	☐ 12	☐ 17	
☐ 3	☐ 8	☐ 13	☐ 18	
☐ 4	☐ 9	☐ 14	☐ 19	
☐ 5	☐ 10	☐ 15	☐ 20	

Other relevant information

Although there is relatively little forest cover in Iraq, (see Sec II NBSAP A.4.d, which found 1.4 % is the percentage of Forest Area (Artificial & Nature) to the Iraqi land, there is some evidence which suggests a decline in tree cover (see Figure 1-4).

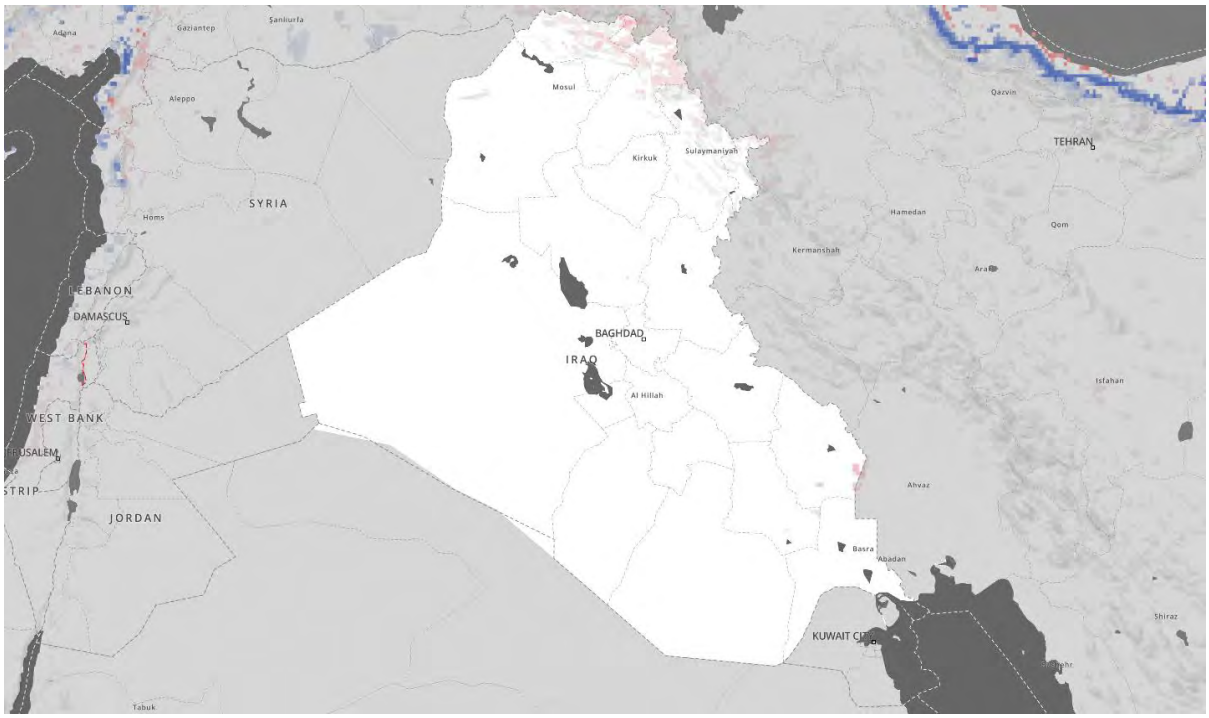

Figure 1-4 Change in tree canopy coverage from 1982-2016. Iraq is shown in white and surrounding countries in grey (white areas show no change in cover) but some areas in the north-east and south-east have lost tree cover over this period. Areas in red indicate tree cover change: the darker the red the more canopy lost with most areas showing a loss of c10-20%. Data downloaded from UN Biodiversity Lab on 05/12/2018 with original data presented in https://www.nature.com/articles/s41586-018-0411-9.

There is therefore a need to control the decline of forests due to natural and human factors through legislation. Underlying reasons for this and actions needed include:

- The need to provide protection to forests from a number of human interventions (overgrazing, logging, accidents like fire, etc.)
- The need to protect forest biodiversity from loss.

Main stakeholders:
MoHEnv, MoA, KRG / MoAWR.

National Biodiversity Target 9 (NBT 9): By the end of 2020, about 1,000 square km of desertified shrub land and grassland have been restored

Rationale for the national target

Desertification refers to land degradation in arid, semi-arid and dry sub-humid areas which arise due to various factors (e.g. climate, anthropogenic activities). Important to note that desertification does not refer to the natural expansion of existing deserts. Desertification has increased over recent decades, creating negative impacts on environmental, economic and social levels for many world nations.
Iraq has been affected by desertification due to several drivers: climate change, low rainfall levels, overgrazing of natural pastures, illegal urban expansion to agricultural land, unsustainable farming practices and old irrigation techniques. The increasing deterioration of Iraqi rivers (e.g. reductions in water flow due to upstream dams) have also increased desertification which has now reached areas that once were among the world's most fertile agricultural areas.

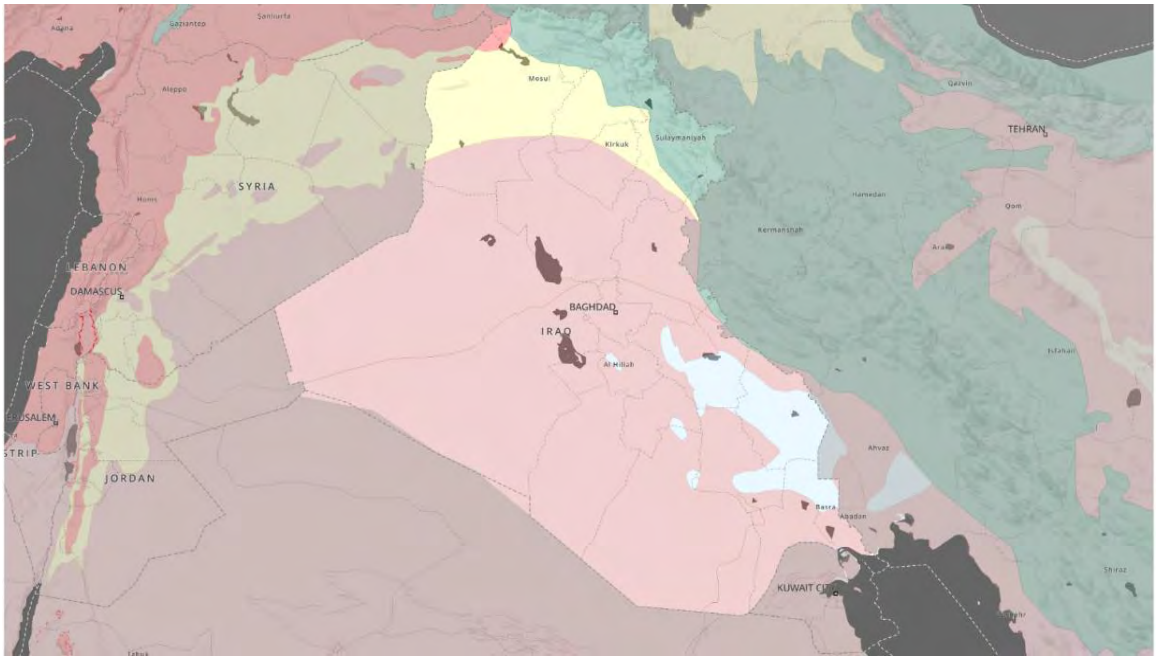

Figure 1-5 Ecoregions of Iraq as defined by Ecoregions 2017 (Dineirstein et al. 2018) – downloaded from UN Biodiversity lab website on 30/10/2018), (Iraq is covered by three different Biomes: pale yellow shows temperate grasslands, savannas and grasslands; pink shows deserts and xeric shrublands; light blue shows flooded grasslands and savannas)

Level of application.

☒ National/federal

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets.

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☒ 5	☐ 10	☐ 15	☐ 20

ATB 5: By 2020, the rate of loss of all-natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

Other related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☒ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
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Other relevant information

The lack of reclamation of agricultural land has led to the deterioration of the land through the exacerbation of salinization of soil and deterioration of natural vegetation which led to the formation of sand dunes, especially in the central and southern areas, as well as the impact of wars on the surface crust of the land.

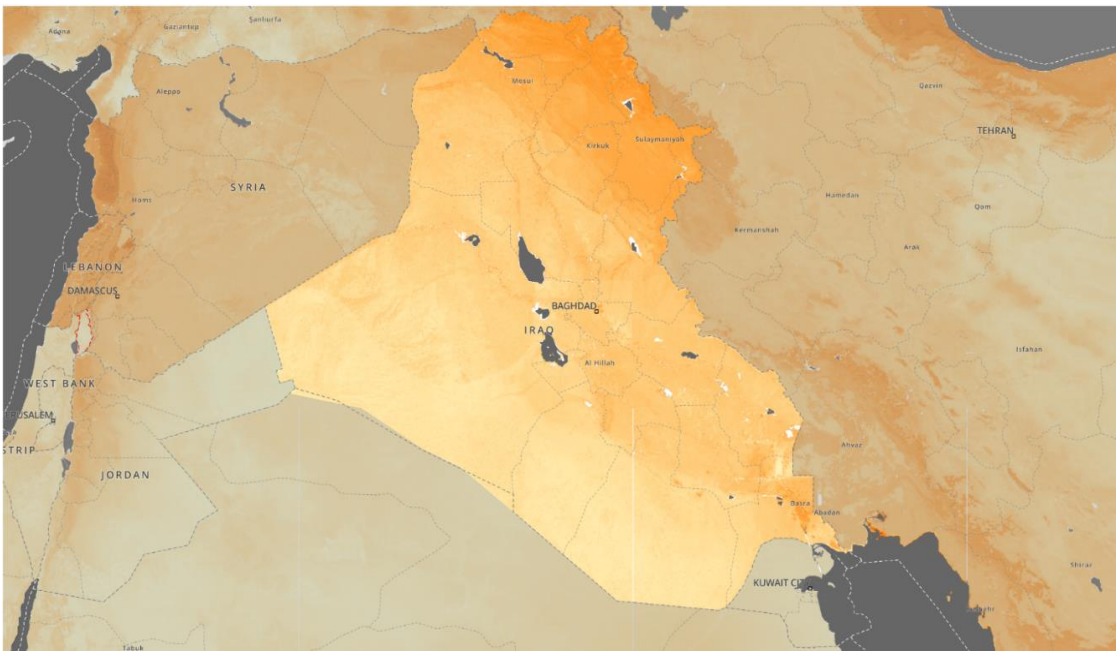

Figure 1-6 The distribution of carbon in the soil in Iraq is high in the north and east (part of UN Biodiversity lab website on 30/10/2018).Note the darker the orange color the higher the Soil Organic Carbon content (with highest values in the north-east of 100 Tons per hectare and lowest in the west and south of 5-10 Tons per hectare).

The following stakeholders have been involved in this target:
MoHEnv, MoA, MoWR, MoP, MoT/IOMS**,** MoHESR.

Strategies and Plans in which this national target has been included:
NESAP (2013-2017) Strategic Objective III: Reduce land degradation and combat desertification.

National Action Program to Combat Desertification in Iraq (2015) includes a national plan on desertification combat and drought management framework with lists of proposed projects for sand dune stabilization, land cover and ecosystem rehabilitation.

NDP (2018-2022) chapter 8 focused on agriculture development challenges; chapter 10 considered the development of the use of alternative sources in agriculture (clean agriculture) as an objective.

Relevant websites, web links, and files

- *The Strategic Plan of the United Nations Convention to Combat Desertification (2008-2018).pdf*
- *NESAP (2013-2017) .pdf*
- *National Action Program to Combat Desertification in Iraq (Arabic).pdf*

http://www.moen.gov.iq /6NR/strategies and Plans

- *NDP (2018-2022).pdf*

https://mop.gov.iq/en/page/view/details?id=88

National Biodiversity Target 10 (NBT 10): By the end of 2016, a national monitoring programme is established for identification of the main sources and diffusion paths of chemical and physical pollutants in the natural ecosystems and the effects of pollution on natural ecosystems.

Rationale for the national target

Issues linked to both water scarcity and pollution have been reported in Iraq. Known sources of pollution include industrial wastewater, effluents from agricultural runoff, and sewage discharge etc. Climate change exacerbates water scarcity through high temperatures, low rainfall and high evaporation rates, and frequent implications on water resources in terms of consumption and pollution and consequently deterioration of water quality. These factors tend to increase the rate of salinity in rivers and cause land desertification and drought. Pollution has been frequently mentioned as one of the threats to a range of species and protected areas (see Sec II / NBSAP A.4.b).

Iraq's coastal waters are characterized by high fertility which attracts fish during the breeding period. Migratory fish migrate from the Gulf to Iraqi waters entering via the Shatt al-Arab, Khor al-Zubair and the Marshes during high sea levels. In recent years, the issue of oil pollution in Iraq's ports has increased significantly, there have been many factors which have caused great damage to Iraq's territorial waters and may cause disruption of the biodiversity through the spread of hydrocarbons into the aquatic environment.
In light of the armed conflicts experienced by Iraq over recent decades, oil pollution was frequently noted as a result of acts of sabotage of oil transport lines, the outbreak of fires, the production and transport and leakage of large quantities of hazardous and toxic chemicals, and the spread of mines in large areas of military action zones and their impact on ecosystems.

Air pollution in Iraq is considered a major environmental problem which is caused by many challenges such as the increase in population accompanied by an increase in transportation. In addition, there are a range of other factors associated with increased human population growth including: more factories (e.g. to produce construction materials like cement, bricks, asphalt); power generation plants; construction work; industrial pollution generated mainly from oil refining and extraction. Other impacts of climate change include weather fluctuations, such as dust and sand storms, resulting in the emission of large amounts of solid suspended particles that impact on the ecosystem and human health.

The issues linked to pollution described above necessitate actions to reduce emission levels. Actions need to be based on sound evidence of the quantities and spatial patterns of pollution and its impact on natural ecosystems. There is a network of both water and air quality monitoring stations (see Sec II/ NBSAP action A.4.e) which are can be used to guide actions. Both networks require expansion to increase coverage across Iraq.

Level of application

☒ National/federal
☒ Subnational – Kurdistan region

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1 ☐ 6 ☐ 11 ☐ 16
☐ 2 ☐ 7 ☐ 12 ☐ 17
☐ 3 ☒ 8 ☐ 13 ☐ 18
☐ 4 ☐ 9 ☐ 14 ☐ 19
☐ 5 ☐ 10 ☐ 15 ☐ 20

ABT 8: By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

Other related Aichi Biodiversity Targets

☒ 1 ☐ 6 ☐ 11 ☐ 16
☐ 2 ☐ 7 ☐ 12 ☐ 17
☐ 3 ☐ 8 ☐ 13 ☐ 18
☒ 4 ☐ 9 ☐ 14 ☐ 19
☐ 5 ☐ 10 ☒ 15 ☐ 20

Other relevant information

Additional reasoning for the creation of this target included:

1. Absence of studies on the impact of the pollutants on the natural ecosystems in Iraq.
2. Environmental pollution impact on economic growth rates, for example: Discharge of pollutants into rivers and the subsequent uptake into fish tissues leading to the deterioration of this resource;
3. Water scarcity and its consequences for increasing salinity rates in inland parts of Iraq, which cause the destruction of species (such as endemic and migratory birds and the extinction of native plant species);
4. Unsustainable land management and over-exploitation of the soil through the unsustainable use of chemical fertilizers and pesticides.

Main stakeholders involved with this target:
MoHEnv, MHEST, MoA, MoWR, MoP, Governorates councils, KRG related institutions.

Strategies and Plans related to this Target:
NESAP (2013-2017).
NDP (2013-2017).

Relevant websites, web links, and files

- *NESAP 2013-2017.pdf*

http://www.moen.gov.iq /6NR /strategies and plans

- *NDP 2013-2017.pdf*

https://mop.gov.iq/en/static/uploads/9/pdf

National Biodiversity Target 11(NBT 11): By the end of 2018 environmental standards are issued and enforced for prevention and control of priority pollutants in the natural ecosystems (not altered by human intervention).

Rationale for the national target

Environmental standards are necessary to protect the environment from pollution. Pollution is one of the main threats to individual species and ecosystems. Such standards are a key component of sustainable development. The criteria used for standards need to be based on scientific principles aimed at mitigating environmental hazards and risks to the environment. Iraq is one of the first countries in the region to prepare legislation that preserves the environment (e.g. for water resources where the regulation of river conservation from pollution was adopted in 1967 and subsequent legislation on air pollution, noise and protecting soil from solid waste pollution). The aim of this target is to develop and enforce water and air quality guidelines/standards, and pollution concentration thresholds to protect natural ecosystems.

Level of application

☒ National/federal
☒ Subnational – Kurdistan region

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☒ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

ABT 8**:** By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

Other related Aichi Biodiversity Targets

☒ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☒ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☒ 15	☐ 20

Other relevant information

The idea behind creating the target was to reduce the negative environmental impacts to accepted levels in accordance with national legislation and international environmental standards.
The country needs to:

1. Determine pollution levels in natural ecosystems.
2. Reduce pollution to levels that are not detrimental to natural ecosystems.
3. Identify highly polluted sites in natural ecosystems.
4. Establish protected areas to improve the quality of the environment.
5.

Stakeholders involved in this Target:
MoHEnv, KRG/ EPIB, legal Authorities, Environment and health Parliament Committee, Council of Ministries.

Strategies and plan related to the Target:
NESAP (2013-2017)
KRG vision 2020
NDP)2018-2022(

Relevant websites, web links, and files

- *NESAP (2013-2017)*

http://www.moen.gov.iq /6NR/strategies and reports

- *KRG vision 2020*

http://cabinet.gov.krd/p/page.aspx?l=12&s=000000&r=409&p=325&h=1&t=0

- *NDP 2018-2022*

https://mop.gov.iq/en/page/view/details?id=88

- *KRG legislation*

http://www.moen.gov.iq /6NR/legislation

National Biodiversity Target 12 (NBT 12): By the end of 2014, a regulation is issued for the establishment of protected areas in Iraq.

Rationale for the national target

Protected areas are a key tool for the protection of the natural environment (including biodiversity) and the associated benefits for humans (e.g. ecosystem services) that are derived from natural resources. Most protected areas have been established for the protection of terrestrial animals, wood lands, wetlands or other habitats. This target is already accomplished since the protected areas legislation was issued in March 2014 (Regulation No. 2 of 2014). In the same year, according to this legislation and as a step forward for its implementation, the National Committee of the Natural Protected Areas (NC-NPA) was established.

Level of application

☒ National/federal
☒ Subnational -Kurdistan region

Relevance of the national targets to the Aichi Biodiversity Targets
Main related Aichi Biodiversity Targets

☐ 1	☐ 6	☒ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
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ABT 11**:** By 2020, at least 17 per cent of terrestrial and inland water areas, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures and integrated into the wider landscapes.

Other related Aichi Biodiversity Targets

☐ 1 ☐ 6 ☐ 11 ☐ 16
☐ 2 ☐ 7 ☐ 12 ☒ 17
☐ 3 ☐ 8 ☐ 13 ☒ 18
☐ 4 ☐ 9 ☐ 14 ☐ 19
☒ 5 ☐ 10 ☐ 15 ☐ 20

Other relevant information

Two pieces of legislation underpin the establishment of protected areas in Iraq. The Environment Law No. 27 of 2009. The Protected Areas legislation was enacted and became effective in March 2014 (Regulation No. 2 of 2014).Law No.8 in 2008 related to environmental protection and improvement in KRG and the regulation of establishment of natural reserves in KRG with the establishment of regulation No 9 in 2011. A committee from MOAWR, MoI, MOFE, EPIB with experts are responsible for assessing the nominations related to establishment of protected areas and approvals in KRG.

Stakeholders involved in the process of establishing protected areas in Iraq:
MoHEnv, MoA, MoWR, MoP, MoTA, MoHESR, MoE, IMA, Civil Society Organizations, KRG related institutions.
Action by these stakeholders resulted in the formation of the National Committee of the Natural Protected Areas (NC-NPA) which was established in 2015. The committee meets regularly and studies the proposals of sites put forward as protected areas, and other steps to be taken by following up site management after declaration and establishment of a protected area.

Strategies and plans in which this national target has been included:
NESAP (2013-2017).
NSPE (2018-2022)/ Activity 4.4 Environmental Tourism in Protected Areas.
NDP 2018-2022, chapter 10 Environmental Sustainability / Goal 3 Protection of Ecosystems.

Relevant websites, web links, and files

- *NESAP (2013-2017)*

http://www.moen.gov.iq /6NR/strategies and plans

- *NSPE (2018-2022).pdf*

https://mop.gov.iq/static/uploads/1/pdf/

- *NDP 2018-2022*

https://mop.gov.iq/en/page/view/details?id=88

National Biodiversity Target 13 (NBT 13): By the end of 2014, at least three training workshops on protected areas management have been conducted.

Rationale for the national target

The management plan for protected areas aims to identify actions, measures and choices to be implemented to achieve the goals and objectives for each protected area. Management plans are characterized by the flexibility that covers a specific period and is updated at regular intervals. These management plans require training courses for those responsible for implementation of actions; the commitment and organizational skills from institutional bodies includes the financial allocations for the process; and finally, to build capacity in protected area management by developing regulatory expertise of stakeholders. It is also necessary to prepare training workshops for decision makers to highlight the importance and increase capacity in knowledge of how to designate protected areas for the conservation of biological diversity and their associated ecosystem services.

Level of application

☒ National/federal
☒ Subnational – KRG

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1 ☐ 6 ☒ 11 ☐ 16
☐ 2 ☐ 7 ☐ 12 ☐ 17
☐ 3 ☐ 8 ☐ 13 ☐ 18
☐ 4 ☐ 9 ☐ 14 ☐ 19
☐ 5 ☐ 10 ☐ 15 ☐ 20

ABT 11: By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascapes.

Other related Aichi Biodiversity Targets

☒ 1 ☐ 6 ☐ 11 ☐ 16
☐ 2 ☐ 7 ☒ 12 ☐ 17
☐ 3 ☐ 8 ☐ 13 ☒ 18
☐ 4 ☐ 9 ☐ 14 ☐ 19
☐ 5 ☐ 10 ☐ 15 ☐ 20

Other relevant information
Stakeholders involved in action for this target:
MoA, MoWR, Civil Society Organizations, Provincial Councils, MoHEnv with the directorates of Environment in the Governorates, NGOs, KRG and related institutions.

Relevant strategies and plans:
NESAP (2013-2017).
NDP (2018-2022).
NSPE 2018-2022) / Activity 4.4: Environmental tourisms in protected areas.
KRG vision 2020.

Relevant websites, web links, and files

- *NESAP (2013-2017).pdf*
- *KRG vision 2020*

http://www.moen.gov.iq /6NR/strategies and plans

- *NSPE (2018-2022).pdf*

https://mop.gov.iq/static/uploads/1/pdf

- *NDP 2018-2022*

https://mop.gov.iq/en/page/view/details?id=88

National Biodiversity Target 14 (NBT 14): By the end of 2016 a study and GIS maps of the most sensitive habitats (i.e. under high level of threats and containing high numbers of globally threatened species) have been developed.

Rationale for the national target

Similar to many parts of the world there are clear drivers of loss to biodiversity in Iraq. The threats to both habitats and species are the subject of action in Iraq and are further outlined (see Sec II/NBSAP action A.4.b). Examples of fragile environments along with the sensitive habitats and threatened species they support include the following areas: the Zagros Mountains Forest Steppe, Middle East Steppe, Mesopotamian Shrub Desert and Tigris-Euphrates alluvial Salt Marsh.
Progress has been made in the development of a GIS database. For example sources of information have been identified: (i) spatial coordinates entered into GIS for Protected Areas (already designated by Iraqi government; global protected area database) and those proposed or waiting to be designated (e.g. as identified by Nature Iraq in 2017 Key Biodiversity Area assessment report); (ii) sources for a range of datasets for environmental variables such as forest cover, biome, threats to biodiversity have been identified from https://unbiodiversitylab.org); (iii) GIS spatial maps for 1388 species (83 of which are threatened as of 10/04/2019) are available to download from https://www.iucnredlist.org/.

Level of application

☒ National/federal

Relevance of the national targets to the Aichi Biodiversity Targets
Main related Aichi Biodiversity Targets

☐ 1	☐ 6	☒ 11	☐ 16	
☐ 2	☐ 7	☐ 12	☐ 17	
☐ 3	☐ 8	☐ 13	☐ 18	
☐ 4	☐ 9	☐ 14	☐ 19	
☐ 5	☐ 10	☐ 15	☐ 20	

ABT 11: By 2020, at least 17 per cent of terrestrial and inland water areas, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected
systems of protected areas and other effective area-based conservation measures and integrated into the wider landscapes and seascapes.

Other related Aichi Biodiversity Targets.

☐ 1	☒ 6	☐ 11	☐ 16	
☐ 2	☐ 7	☒ 12	☐ 17	
☐ 3	☐ 8	☐ 13	☐ 18	
☐ 4	☐ 9	☐ 14	☐ 19	
☒ 5	☐ 10	☐ 15	☐ 20	

Other relevant information

Due to the large number of environmental threats to habitats and important species, assessment of sensitive habitats and threatened species is required throughout the country for the preparation of a database and mapping of sensitive habitats. However, the data sources identified above are a good start to identifying key data sets.
Stakeholders involved in this work include:
MoHEnv, MoP, MoA, and a range of academic institutions, and also incorporated information from international organizations (namely International Union for the Conservation of Nature and United Nations Development and United Nations Environment Programme).

Relevant strategies and plans:
NDP (2013-2017)
NESAP (2013-2017)
Relevant websites, web links, and files

- *NESAP (2013-2017).pdf*

http://www.moen.gov.iq /6NR/Strategies and plans

- *NDP 2013-2017.pdf*

https://mop.gov.iq/en/static/uploads/9/pdf

National Biodiversity Target 15 (NBT 15): By the end of 2020, ten new protected areas have been gazetted and established.

Rationale for the national target
Protected areas are an important tool for preserving biodiversity, reducing extinction risk of threatened species and ensuring ecosystem services, in the areas designated, can provide multiple benefits to humans. Earth is currently undergoing the 6th Extinction Phase of species (with man contributing substantially to it through a range of activities such as deforestation, farming intensification, hunting etc.) and so protected areas are a vital way to help slow or halt these declines.
Protection of biodiversity also helps to conserve genetic resources for current and future generations, through drawing borders around these sites and granting them formal legal protection. Such areas also need suitable management plans to maximize the gains that can come from them. A network of sites is needed to ensure robust and resilient protection.

Level of application

☒ National/federal

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1	☐ 6	☒ 11	☐ 16	
☐ 2	☐ 7	☐ 12	☐ 17	
☐ 3	☐ 8	☐ 13	☐ 18	
☐ 4	☐ 9	☐ 14	☐ 19	
☐ 5	☐ 10	☐ 15	☐ 20	

ABT 11: By 2020, at least 17 per cent of terrestrial and inland water areas, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of Protected Areas and other effective area-based conservation measures and integrated into the wider landscapes and seascapes.

Other related Aichi Biodiversity Targets

☐ 1	☒ 6	☐ 11	☐ 16	
☐ 2	☐ 7	☒ 12	☐ 17	
☐ 3	☐ 8	☐ 13	☐ 18	
☐ 4	☐ 9	☐ 14	☐ 19	
☒ 5	☐ 10	☐ 15	☐ 20	

Other relevant information

Several pieces of legislation underpin the establishment of protected areas in Iraq. First, the Environment Law No. 27 of 2009. Second, the Protected Areas legislation was enacted and became effective in March 2014 (Regulation No. 2 of 2014). Third, Law No. 8 of 2008 is for the environmental protection and improvement in KRG and the regulation No. 9 of 2011 of establishment of natural reserves in the Kurdistan Region of Iraq and its management. The speed with which protected areas are being formally ratified would benefit from a more streamlined approach. The current area of land under legal protection in Iraq is only 1.53%, while a long list of 18 sites of world protected areas database await for formal designation and 82 from the Key Biodiversity Area assessment report, published in 2017, are not yet legally protected.

The stakeholders involved in action for this target include:

MoHEnv, MoA, MoWR, MoP, MoTA, MoHESR, MoE, IMA, Civil Society Organizations, KRG related institutions.

Relevant strategies and plans:

NESAP (2013-2017).
KRG vision 2020.

Relevant websites, web links, and files

- *NESAP (2013-2017)*

http://www.moen.gov.iq /6NR/ strategies and plans

- *KRG Vision 2020*

http://cabinet.gov.krd/p/page.aspx?l=12&s=000000&r=409&p=325&h=1&t=0

- *The Environment Law No. (27) of 2009*
- *Protected Area Law No. (2) of 2014*
- *KRG legislation*

http://www.moen.gov.iq /6NR/Legislation

National Biodiversity Target 16 (NBT 16): By the end of 2016, a national assessment is published of the state of provisioning, regulating and cultural services supplied by natural ecosystems and their importance for rural and urban people and on management options to be developed for the sustainable supply of ecosystem services.

Rationale for the national target

Ecosystems in Iraq provide a wide range of services for humans living in both urban and rural environments. Examples of ecosystem services provided by the natural environment include clean air and water, food, raw materials for fuel and building like woods & reeds, medicinal plants and genetic resources. These services are usually categorized into four categories: (i) provisioning services such as the fish that is obtained from a Marsh or from the sea; (ii) regulating services, such as those provided by Marshes which naturally absorb seasonal floods,

and moderation of drought at local scales; (iii) supporting services, such as those provided by pollinating insects to crops; and (iv) cultural services such as aesthetic and heritage values.

Ecosystems in Iraq are exposed to many threats, such as climate change and water scarcity, that have led to a degradation of these natural systems. The ability of natural habitats to provide these key ecosystem services is continuing to decline, due to their loss and degradation, and compounded by stresses from climate change (examples provided in Table 1-1 below). It is necessary to know the services provided by the major ecosystems in Iraq, to categorize their type and beneficiaries, and to develop a methodology for managing and using them in a sustainable manner that reduces threats to them. These are presented in the NBSAP and later in this document. The objective of this target is to list and assess, according to this categorization, all the services provided by Iraqi natural systems, together with suggesting possible options for their sustainable use.

Level of application

☒ National/federal
☒ Subnational – Kurdistan region

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☒ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

ABT 14: By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and wellbeing, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.

Other related Aichi Biodiversity Targets

☒ 1	☒ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☒ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

This national target has been established and adopted based on the information and data contained in the Fourth National Report and the Fifth National Report namely:

1. The existence of major environmental systems "core environmental zones" covering most of the country, these systems contain important and key biodiversity and ecosystems that provide services to the people of Iraq.
2. Ecosystems are rapidly deteriorating and are being eroded in non-sustainable ways although the environmental quality of some areas have been improved, such as the Marshlands.
3. Exposure to the effects of climate change, desertification and lack of water imports from neighbouring countries that have degraded the environment.

Main stakeholders engaged in this Target are:
MoHEnv, MoA, MoWR, MoP**,** Universities and researches institutions, NGOs, KRG/ MoAWR and EPIB, Governorate/Provincial Councils.

This Target is included in national plans and strategies:

Consolidated Management Plan of the Ahwar of Southern Iraq (2014).
NSPE 2018-2022 / First Outcome: Higher and sustainable income from work for the poor with related activities that are consistent with sustainable development.
NDP plan 2018-2022/ Chapter 4: Environmental Sustainability/ Biodiversity.

Examples of Ecosystem Services (e.g. to illustrate Table 1-1**)**
Examples in rural areas are presented below include: (i) provisioning services provided by reeds for Marsh Arabs for housing, boats and other infrastructure; (ii) regulating services are provided by marshlands by removing pollution from river water flowing into the marshes. Examples in urban areas include: (a) the cultural services provided by parks in urban areas (mental and physical well-being of using parks); (b) the role of green infrastructure in reducing pollution levels in urban areas which has associated benefits for human health.

Table 1-1 some key ecosystem services in Iraq, key threats to them and proposed broad actions

Ecosystem Service	Threats	Proposed action
(1) Pollination of crops by insects (see Figure 2-33)	Climate change, pesticides, lack of natural habitats in surrounding areas	Increase the extent of natural habitats surrounding crops to enable insect-pollinators to visit crops
(2) Water quantity	Upstream dams blocking quantity of water in key rivers and restricting flow to downstream agricultural areas and Marshlands	Sustainable water resources management and bilateral cooperation with riparian countries
(3) Water quality	Pollution from waste water effluents and agricultural run-off	Environmental Law enforcement and public awareness
(4) Green infrastructure in urban areas	New development	Integrate green infrastructure into national development planning
(5) Use of reeds for human buildings and other buildings (Marsh Arabs)	Climate change (increased droughts)	Formal protection of Marshland areas

Relevant websites, web links, and files

- *Consolidated management plan of the Ahwar of Southern Iraq: Refuge of Biodiversity and Relict Landscape of the Mesopotamian Cities .pdf*

http://www.moen.gov.iq /6NR/strategies and plans

- *NSPE (2018-2022).pdf (in Arabic)*

https://mop.gov.iq/static/uploads/1/pdf/National Development Plan 2018-2022 (Arabic).pdf

- *NDP 2018-2022*

https://mop.gov.iq/en/page/view/details?id=88

National Biodiversity Target 17 (NBT 17): By the end of 2018 a national strategy/sub-national strategy are established for the sustainable management of ecosystems to supply important ecosystem services for rural and urban people.

Rationale for the national target

The purpose of this target is to develop a national strategy and local strategies for the purpose of conservation of natural habitats to ensure viable functioning ecosystems that can provide services for the benefit of people in Iraq. This step comes after the main ecosystem services and the natural habitats that supply them have been identified nationally (see Sec II NBSAP A.2.g).

Level of application
☒ National/federal

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1 ☐ 6 ☐ 11 ☐ 16
☐ 2 ☐ 7 ☐ 12 ☐ 17
☐ 3 ☐ 8 ☐ 13 ☐ 18
☐ 4 ☐ 9 ☒ 14 ☐ 19
☐ 5 ☐ 10 ☐ 15 ☐ 20

ABT 14: By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and wellbeing, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.

Other related Aichi Biodiversity Targets

☒ 1 ☒ 6 ☐ 11 ☐ 16
☐ 2 ☐ 7 ☐ 12 ☒ 17
☐ 3 ☐ 8 ☐ 13 ☐ 18
☐ 4 ☐ 9 ☐ 14 ☐ 19
☐ 5 ☐ 10 ☐ 15 ☐ 20

Other relevant information

National target 17 has been established and adopted based on the information and data included in the fourth and fifth national reports. In brief this includes the following:

1. The mapping of major ecosystems "main ecoregions" covering the vast majority of the country.
2. These ecosystems services are rich in biodiversity and provide environmental services to the community (see Sec II /NBSAP A.4.f).
3. Description of the rapid deterioration of natural ecosystems whilst, in contrast, some ecosystems have been enhanced in recent times (e.g. through reflooding of the Iraqi Marshes).
4. Impact of climate change, desertification and lack of water resources from neighboring countries has been outlined.

Relevant stakeholders involved in this target:
MoHEnv, MoA, MoWR, KRG/EPIB, Universities and research institutions, NGOs.

This Target is included in the national plans and strategies:

Integrated Management Plan for the Marshlands of Southern Iraq: a haven for biodiversity and ancient landscapes in the cities of Mesopotamia (see section one: action plans-strategic objective 3-1).
4th National Report on Biodiversity.
5th National Report on Biodiversity.

Relevant websites, web links, and files

- *iq-nr-04-en.pdf*
- *iq-nr-05-en.pdf*

http://www.moen.gov.iq /6NR/Reports

- *Integrated Management Plan for the Marshlands of Southern Iraq: A haven for biodiversity and ancient landscapes in the cities of Mesopotamia.).pdf*

http://www.moen.gov.iq /6NR/Strategies and Plans

National Biodiversity Target 18 (NBT 18): By the end of 2017, legislation is enacted to control the introduction and diffusion of non-native species into the natural environment.

Rationale for the national target

Iraq is connected to the wider international community through the importation of goods and materials. There are relatively weak controls of non-native species transmission across the Iraqi borders. This may have been the cause of several alien species occurring in Iraq, therefore it is necessary for legislation to prevent the spread of invasive species which can be effectively implemented. The effectiveness of the legislative provision depends on the commitment of the involved institutional bodies and on the capacity of the institutional power to implement and enforce the provisions.

There are 14 species listed in the IUCN Red List under the category 'introduced' in Iraq (see Table 1-2 below).
Table 1-2 List of species classified as 'introduced' in Iraq on the IUCN Red List (https://www.iucnredlist.org/). The class of each species and its Latin name are shown here. Also shown are the Red List status (LC = Least Concern;). The trends in populations of each species (as assessed by the IUCN) are shown in the final column.

Class	Genus	Species	Red List status	Population trend
AVES	*Acridotheres*	*tristis*	LC	Increasing
MAGNOLIOPSIDA	*Bauhinia*	*purpurea*	LC	Stable
MAGNOLIOPSIDA	*Bauhinia*	*variegata*	LC	Stable
ACTINOPTERYGII	*Clarias*	*gariepinus*	LC	Unknown
MAGNOLIOPSIDA	*Eclipta*	*prostrata*	LC	Stable
ACTINOPTERYGII	*Heteropneustes*	*fossilis*	LC	Stable
ACTINOPTERYGII	*Hypophthalmichthys*	*nobilis*	DD	Decreasing
MALACOSTRACA	*Macrobrachium*	*nipponense*	LC	Stable
LILIOPSIDA	*Paspalum*	*distichum*	LC	Unknown
GASTROPODA	*Potamopyrgus*	*antipodarum*	LC	Stable
AVES	*Psittacula*	*krameria*	LC	Increasing
MAGNOLIOPSIDA	*Robinia*	*pseudoacacia*	LC	Increasing
MAGNOLIOPSIDA	*Sphaerophysa*	*salsula*	LC	Stable
MAMMALIA	*Suncus*	*murinus*	LC	Stable

Not all introduced species have been either assessed on the IUCN Red List, or even if they are, have not (yet) been linked with Iraq. Non-native species are sometimes well adapted and rapidly spread across native ecosystems which can result in a large number of environmental and economic problems. Two species that have had significant impacts (that are not on the IUCN Red List) are the blooming of the water hyacinth *Eichhornia crassipes* and the spread of the fish *Coptodon zilli.* Due to the potential negative impacts of non-native species on the indigenous biological diversity in Iraq, national cross-border control and surveillance is required to reduce the spread of invasive alien species. Thus, the development of legislation to control the introduction and spread of non-domestic species in the natural environment is required.
Article 8E of the Convention on Biological Diversity (CBD) calls on the Member States to prevent the introduction of invasive species that threaten ecosystems, habitats and species, and to control their spread and disposal.

Level of application

☒National/federal

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☒ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

ABT 9: By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

Other related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐	☒ 12	☐ 17
☐ 3	☒ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

Some invasive alien species can have devastating effects on native animal and plant species, causing extinction and impact on natural capital and ecosystem services. Many alien species have been recorded in Iraq, some of which have become threatened with native species and competition for habitat. Iraq does not have national legislation regulating the trade of transboundary species or controlling the presence of invasive alien species, and therefore there is a pressing need for the establishment of legislation to support this target**.**

Main stakeholders involved with the implementation of this Target:
MoHEnv, MoA, MoT, MoWR, MoF / General Customs Authority, MoI, KRG related institutions.

This Target is included in national plans and strategies:
NESAP (2013-2017) /Component III: Bio safety and security/ Alien invasive species within Iraqi environments/p46
NDP (2013-2017) / Chapter 4 / Sectoral Development

Relevant websites, web links, and files

- *NESAP (2013-2017)*

http://www.moen.gov.iq /6NR/strategies and plans

- *NDP 2013-2017.pdf*

https://mop.gov.iq/en/static/uploads/9/pdf

National Biodiversity Target 19: (NBT 19): By the end of 2020 the list of invasive species of Iraq and their impacts and invasion pathways have been published.

Rationale for the national target

Invasive Alien species are one of the causes of extinction of native species. Local species may be classified as invasive if they are not native to a specific location, and the species reaches sufficient abundance to cause damage to the environment, human economy or human health. Invasive species are considered one of the drivers of biodiversity loss in many ecosystems. Also, they may cause economic and social losses through its threat to food security and drinking water supply as well as to human health and economic development.
Good progress in achieving this target has already been achieved by compiling a national list of non-native or invasive species with the support of ISSG (Invasive Species Specialist Group) of IUCN within the framework of the Iraqi 5th National Report to the CBD. This list needs to be further refined and completed, especially in relation to the invasiveness status of many non-native species. Invasion pathways need to be described in order to target actions to control focal species.

Level of application

☒ National/federal
☒ Subnational – KRG

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☒ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

ABT 9: By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

Other related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☒ 12	☐ 17
☐ 3	☒ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

Main stakeholders involved with implementation this target
MoHEnv, MoA, MoWR, Universities and Research Institutions, KRG related institutions, NGOs (e.g. Iraqi Green Climate Organisation, Nature Iraq).

This Target is included in national plans and strategies:
NESAP (2013-2017) /Strategic objective V/ Protection and sustainability use of Biodiversity

Relevant websites, web links, and files

- *NESAP 2013-2017. pdf*

http://www.moen.gov.iq /6NR/strategies and plans

National Biodiversity Target 20 (NBT 20): By the end of 2020 the list of threatened species of Iraq has been published and an action plan for the conservation of priority species is produced

Rationale for the national target

The Earth is entering the 6th extinction phase of biodiversity loss and so protection of species threatened with extinction is important. The set of threatened species, at a global scale, that is supported by Iraq is determined by the IUCN Red List of Threatened Species. The IUCN classifies species into different codes for their risk of extinction. Those species classed as either "Critically Endangered", "Endangered" or "Vulnerable" are collectively referred to as threatened (see Figure 1-7 below).

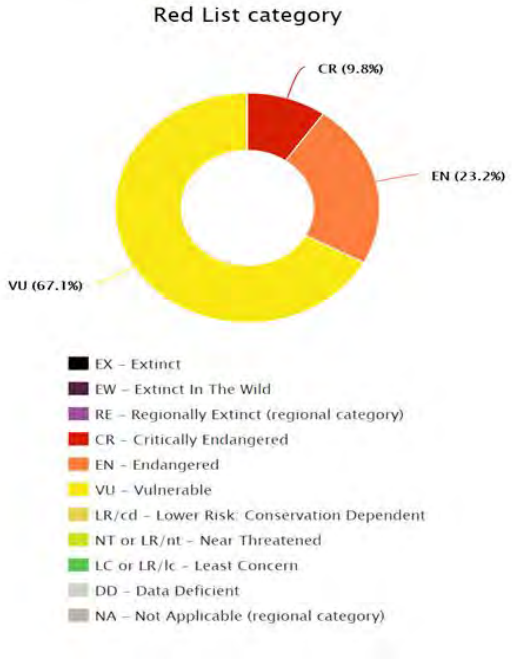

Figure 1-7 There are 82 species classified as threatened at the global scale (classified as either Critically Endangered, Endangered or Vulnerable) in Iraq. Data downloaded from IUCN Red List on 12/11/2018.

The national target focuses on the state of each species within country. Some species not included in the IUCN Red List for Threatened Species (i.e. not included in the 82 species and shown in Figure 1-2) are included in the National List (e.g. because they are threatened within Iraq but may be common elsewhere). For each species on the national Native Threatened Species List, drafting of Single Species Action Plans SSAP are in process. These plans are aimed at improving habitats status and, reducing pressures on these species that could provide more protection for the native threatened species in Iraq and improve the conservation status of the species. Actions are also linked with other targets, for example, there are also five designated protected areas in Iraq, 18 in the process of designation and 82 sites identified that could be future, areas for species conservation (see NBSAP A.2.a).

This target requires the continued collection of new knowledge about Iraqi species, an update and analysis of recent assessments and surveys, in order to evaluate the conservation status of species whose status is recognized as critical nationally. At the national level there is also a need for action plans for species conservation.

Iraq acceded/ratified to several environmental international conventions such as the Convention of Migratory Species (CMS), Convention of International Trade of Endangered Species of Fauna and Flora (CITES), and Ramsar Convention which is closely linked to this national target.

Level of application

☒ National/federal

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1 ☐ 6 ☐ 11 ☐ 16
☐ 2 ☐ 7 ☒ 12 ☐ 17
☐ 3 ☐ 8 ☐ 13 ☐ 18
☐ 4 ☐ 9 ☐ 14 ☐ 19
☐ 5 ☐ 10 ☐ 15 ☐ 20

ABT 12**:** By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

Other related Aichi Biodiversity Targets

☐ 1 ☐ 6 ☒ 11 ☐ 16
☐ 2 ☐ 7 ☐ 12 ☐ 17
☐ 3 ☐ 8 ☒ 13 ☐ 18
☐ 4 ☐ 9 ☐ 14 ☐ 19
☒ 5 ☐ 10 ☐ 15 ☐ 20

Other relevant information

The main source of information concerning endangered species in Iraq are derived from:

1. Peer-reviewed and grey literatures. Both come from a combination of NGOs, government and academics.
2. Data from check-lists from amateur naturalists.
3. Global data sets (e.g. IUCN Red List of Threatened Species)

At a national level, the development of a target for threatened species has involved the following stakeholders: MoHEnv, MoA, MoWR, Universities and Research Institutions, KRG related institutions, NGOs.

National Biodiversity Target 21(NBT 21): By 2020 legislation for the conservation of threatened species is issued and enforced.

Rationale for the national target

National environmental challenges and threats have increased significantly in the last ten years. This issue has influenced the country's national environmental strategies. The exploitation of natural resources, development pressures (e.g. building infrastructure), climate change and habitat degradation are the main threats that led to biodiversity loss and changing of species conservation status (Fig 1-1 above). Lack of specific legislation concerning threatened species and the weakness of the environmental legislation's enforcement are additional challenges that led to the formation of this national target. Implementation of the NBT 21 and enforcing the legislation until 2020 is expected to enhance and improve conservation of threatened species.

Level of application

☒ National/federal
☒ Subnational –KRG

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1 ☐ 6 ☐ 11 ☐ 16
☐ 2 ☐ 7 ☒ 12 ☐ 17
☐ 3 ☐ 8 ☐ 13 ☐ 18
☐ 4 ☐ 9 ☐ 14 ☐ 19
☐ 5 ☐ 10 ☐ 15 ☐ 20

ABT 12**:** By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

Other related Aichi Biodiversity Targets

☐ ☐ 6 ☒ 11 ☐ 16
☐ 2 ☐ 7 ☐ 12 ☐ 17
☐ 3 ☐ 8 ☒ 13 ☐ 18
☐ 4 ☐ 9 ☐ 14 ☐ 19
☒ 5 ☐ 10 ☐ 15 ☐ 20

Other relevant information

The Fourth National Biodiversity Report (2010) in chapter II (page 69-72) provided detailed information about the environmental legislation status, which helped to identify gaps and needs for adoption of specific legislation for threatened species. This was also mentioned in the Fifth National Biodiversity Report and NBSAP (2014). After the ratification of Iraqi Environment law, issued in 1997, several laws and bi-laws were issued by the Iraqi Parliament from 2006 to 2010. Specifically, law on the protection of wild animals No. 17 in 2010 included regulation prohibiting the (illegal) hunting activities of threatened Iraqi species.

The stakeholders involved in this target include:

MoHEnv, MoA, KRG/MoAWR and EPIB, MoHESR.

Strategies and Plans related to this Target**:**
NBSAP (2015-2020)

Relevant websites, web links, and files

- *law on protection of wild animals No. 17 for 2010. Pdf*

http://www.moen.gov.iq /6NR/legislation

- *NBSAP (2015-2020).pdf*

http://www.moen.gov.iq /6NR/strategies and plans

National Biodiversity Target 22 (NBT 22): By the end of 2020, a survey of indigenous and local communities' traditional knowledge, use and practices relevant for the conservation and sustainable use of biodiversity is published.

Rationale for the national target

Traditional Knowledge (TK) includes the body of knowledge built by indigenous and local communities over generations. (TK) can contribute to both the conservation and the sustainable use of biodiversity. TK is especially important in ensuring the variety of biodiversity and natural resource management practices required for adaptation to climate change impacts. To achieve ABT 18, Iraq must assess how well TK has been integrated and reflected in different phases of the implementation of the CBD convention, assess the degree of participation of indigenous and local communities, identify mechanisms for improving the integration of indigenous and local communities, and adopting participatory approaches to local-level decision making.
This target involves the participation and cooperation of the local authorities and institutions besides local conservation groups and NGOs. The first step is to carry out surveys that will cover the whole country, as much as feasible. Target questionnaires have been used to collect the relevant information about the way in which local communities are using and benefitting from the services provided by ecosystems and on their traditional ways to conserve and improve the environment.

Level of application

☒ National/federal
☒ Subnational – KRG

Relevance of the national targets to the Aichi Biodiversity Targets

Main related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☒ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

ABT18: By 2020, the Traditional Knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels"

Other related Aichi Biodiversity Targets

☒ 1	☐ 6	☒ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☐ 9	☒ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

Stakeholders engaged with development and adoption of this Target:
MoHEnv, MoC, MoTA, Environment Researchers, Governorates Councils, KRG relevant institutions, NGOs.

National Biodiversity Target 23 (NBT 23): By 2016 a Resource Mobilization Plan for implementation of the NBSAP is established and implemented.

Rationale for the national target

This target is essential to achieve all national targets and to implement the NBSAP. To achieve this target there is a need to understand the current national actions relating to biodiversity (and their economic costs) and identify the full costs of implementing NBSAP and associated actions. There is also a need to develop a detailed resource mobilization plan based on the resource mobilization strategy (2015-2020) (see http://www.biodiv.be/iraq), that identifies a wide range of finance actors, mechanisms and opportunities for mobilizing biodiversity resources.

Level of application

☒ National/federal
☒ Subnational – KRG

Relevance of the national targets to the Aichi Biodiversity Targets
Main related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☐ 12	☐ 17
☐ 3	☐ 8	☐ 13	☐ 18
☐ 4	☒ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other related Aichi Biodiversity Targets

☐ 1	☐ 6	☐ 11	☐ 16
☐ 2	☐ 7	☒ 12	☐ 17
☐ 3	☒ 8	☐ 13	☐ 18
☐ 4	☐ 9	☐ 14	☐ 19
☐ 5	☐ 10	☐ 15	☐ 20

Other relevant information

Although there is no action identified in the National Strategy of Biodiversity and Action Plan 2015-2020 for this target, a range of actions have, nevertheless, been undertaken which are outlined below.

There is no special budget allocated for NBSAP implementation as Iraq faced after 2015 economy crises with low international oil prices and a poorly diversified economy, vulnerable security situation and political instability that continue to slow economic growth and divert government expenditures for social and economic services to defence, thus negatively affecting Ministries annual budget allocation.

Survey cost and staff salaries are covered by their Ministries (for example the Environment Fund in MoHEnv) or from the budget of governorates that uses finances collected from fines and taxes resulting from application of the law.

External funds from donors or global facilities like GEF, contributed to support countries including Iraq on projects concerned with biodiversity. For example, the GEF funded project “Project for the establishment of a network of Protected Areas in Iraq (Tayeb and Dalmaj)” (2018-2020) with $4,680,365

GEF funded project “Preparation of the Special National Report -The United Nations Convention on Desertification UNCCD” (2018) with $70,000. GEF funded project “Sustainable Land Management for Sustainable Livelihoods in the Degraded Areas of Iraq” (2018-2022) with: US $ 3,410,000.

Building Resilience of the Agriculture Sector to Climate Change in Iraq (BRAC) (2018-2024) funded by IFAD with US $ 9,999,660.

Stakeholders involved with this Target:

MoHEnv, MoF, KRG related Ministries.

Section II. Implementation Measures taken, Assessment of their Effectiveness, associated Obstacles and Scientific and Technical Needs to achieve the National Targets

NBSAP A.1.a: By the end of 2016 a national survey is completed to know how many awareness tools (films, documentaries, publications, educational programs, guidance materials and trainings) on environment and biodiversity exist.

Measures taken to contribute to the implementation of the action

An inventory (see Annex 1) was established to catalogue existing awareness tools that the Ministries and civil society organizations have developed. These tools were used as part of their efforts of achieving their biodiversity and environment awareness programs. MoHEnv in coordination with related Ministries and NGOs will update this inventory to include all publications, materials, education programs related to the environment in general with a particular focus on biodiversity.

1. Two NGOs (Nature Iraq and Iraqi Green Climate Organization) described awareness activities through their web sites and social media.
2. MoHEnv and other Ministries published a range of brochures and booklets.
3. For a description of training and workshops (see NBSAP Action A.1.b and A.1.c).
4. Conferences are listed also in Annex 1.

Contribution to the Aichi Biodiversity Targets or National Targets

NBT 3**:** By the end of 2015, a national survey of tools used for public awareness of biodiversity is completed.

Effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been partially effective.

The reason of selection the measure's effectiveness

Measure taken has been partially effective because:
The national survey was not completed within the specified period; more efforts are needed for coordination between all stakeholders involved with environmental awareness to update the inventory with awareness tools. Numbers of awareness tools compiled in the inventory are limited and do not cover the complexities of the environmental issues in Iraq.

Other relevant information

Case Study

The Role of social media on environmental awareness by undergraduate students from the University of Sulaymaniyah in Iraq

Social media has grown rapidly as a type of online communication tool whereby users make comments, share comments made by others, and put videos, photos and posts on social networking sites. Environmental issues are progressively of higher priority for humanity. Therefore, social media has the potential to be a substantial tool for raising environmental awareness. A study conducted by the media department at the University of Sulaymaniyah aimed to investigate the role of social media in environmental awareness by undergraduate students as an example of student views at higher education institutions.

Most students used this outlet to express their views on environmental awareness and some have published environmental awareness posts on social media using their individual accounts. The most popular social media platforms, linked by students to environmental issues, were as follows: (i) Facebook; (ii) YouTube; (iii) Instagram; and (iv) Twitter. The **video** post was well received by most students and the **text** posts favorably impressed many students.

Samples were collected randomly from different students at different stages of their degrees (from stage one to stage four). In total 96 students participated and those sampled were chosen randomly with respect to age and gender. Sixty-nine percent of participants were male.

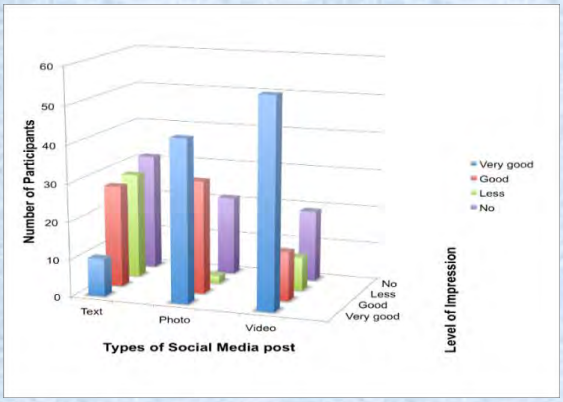

Figure 2-1 Participation in social media post

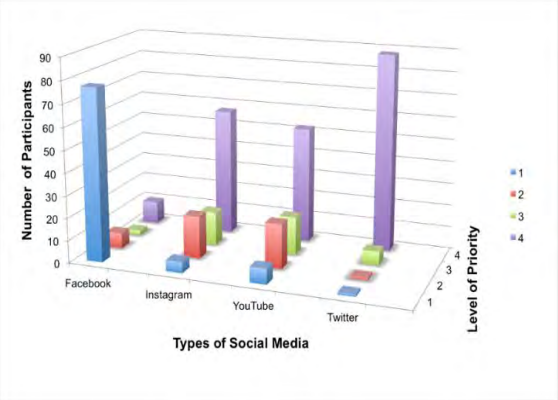

Figure 2-2 Participation by social media type

https://www.researchgate.net/publication/307968837_The_Role_of_Social_Media_on_Environmental_Awareness_of_Undergraduate_Students_in_University_of_Sulaimaniyah_in_Iraq

Obstacles and scientific and technical needs related to the measure taken:

Obstacles:

1. Financial barriers remain a major hurdle in Iraq as the country is coping with the challenges to recover from the devastation caused by Terroir. Financial allocation for conservation of biodiversity is yet to be considered as a priority.
2. Lack of knowledge on biodiversity value and ecosystem services especially at the local level.
3. Insufficient work done on achieving the target because of weak coordination between the stakeholders.
4. Security conditions across several governorates who were at risk of conflict, was an obstacle, that limited the involvement of these areas.

Requirements:

1. More cooperation is needed between stakeholders (Ministries and NGOs) in conducting advocacy programs.
2. Training programs, to relevant NGOs and media institutions on biodiversity conservation and challenges in Iraq.
3. Assessment studies are needed on the impact of the awareness tools and programs in changing the behaviour of the local communities.
4. Technical assistance from international organizations to develop comprehensive locally defined, area based and targeted awareness programs.
5. Improved coordination is needed between the research centres and relevant Ministries for sharing information, exchange of ideas on various aspects of conservation and biodiversity management.
6. Mainstreaming biodiversity awareness in social media,
7. A communication strategy is needed for all related stakeholders to enable effective dissemination of biodiversity awareness to people at national and local levels.

NBSAP A.1.b: Starting from the Strategy approval (2015), each ministry organizes two annual workshops for their employees and manager in order to raise awareness and update about biodiversity issues.

Each ministry was tasked with carrying out two workshops to raise awareness among citizens, especially state employees. Table (2-1) shows the numbers of workshops during the last four years (2015-2018) across ministries including MoHEnv, MoHESR, MoA.

Table 2-1: workshops undertaken from 2015-2018.

	Workshop Title	Organizers	Date	Participant #
1	Impact of expected drought on plant diversity in Iraq	University of Baghdad / Research Center and Museum of Natural History	21/2/2018	49
2	Biological diversity in the marshes of Iraq	University of Baghdad / Research Center and Museum of Natural History	20/12/2017	60
3	Environment and Biodiversity	MoHESR /Technical Institute / Department of Water Resources Technologies	26/3/2018	43
4	The challenges of the environment and its impact in the Islamic perspective	MoHESR / Mosul University and in collaboration with the Noon Center for Studies and Research	28/11/2018	65
5	Scientific symposium on the deterioration of the reality of bees in Iraq	University of Baghdad / Research Center and Museum of Natural History	7/12/2017	40
6	Scientific research is a means to preserve biological diversity and the environment	Society for the Conservation of Genetic Resources and the Iraqi Environment.	25-26/12/2017	60
7	Insects alien to the Iraqi environment	University of Baghdad / Research Center and Museum of Natural History	1/11/2015	42
8	Endangered Iraqi Species According to IUCN list	MoHEnv in cooperation with the Palm Environment and Agriculture organization.	14/11/2018	75
9	Convention on International Trade in Endangered Species of Wild Fauna and Flora	Ministry of Health and Environment/ Baghdad province.	24-26/7/2018	35
10	Convention on International Trade in Endangered Species of Wild Fauna and Flora	Ministry of Health and Environment/ Basra province.	30 /6/2018	24
11	Convention on International Trade in Endangered Species of Wild Fauna and Flora	MoHEnv/ Basra province.	24-26/7/2018	18
	Total			**511**

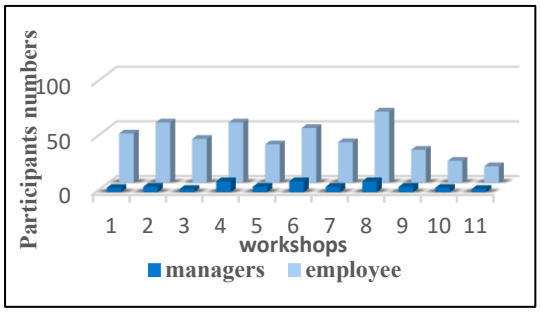

Figure 2-3: managers/employees participation

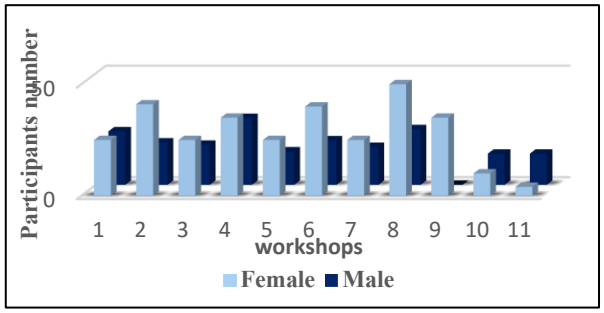

Figure 2-4: Participation by male and female

The results in Figures 2-3 and 2-4 and Table 2-1 show a limited number of Ministries (only five) were engaged in this action; 511 managers and employees participated in 11 workshops since 2015. The rate of participation in Ministries was weighted towards employees (87%) with the remaining number comprising managers. Sixty-two per cent of attendees were women.

Contribution to the Aichi Biodiversity Targets or National Targets

NBT 2: By 2020, 50% of policy makers and planners have awareness of the status of biodiversity, its benefits for people, the pressures that affect it, and the actions they can take for its conservation and sustainable use.

Effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been ineffective

The reason of selection the measure's effectiveness

Since 2015 few ministries have completed workshops targeted at their staff to raise awareness about biodiversity challenges, so there is insufficient action to meet this goal.

Relevant websites, web links and files

- *Workshops folders*

http://www.moen.gov.iq /6NR/Awareness

Other relevant information,

An example of multi sectors coordination, was an event joining policy makers, academics and experts at a conference on genetic resources conservation held on 27-28 March 2018.

Press release

Fifth International Scientific Conference on Genetics and the Environment

Under the slogan of scientific research as a means to preserve biological and environmental diversity, the Society for the Conservation of Genetic Resources and the Environment of Iraq held its fifth International Scientific Conference on Genetics and the Environment in cooperation with the Ministry of Health and Environment, the Canadian Institute of Health Sciences and the Palm Environment and Agriculture organization. The conference was held in Baghdad during the period 27-28 March 2018 with the participation of high-level scientific personnel and in the presence of the technical Deputy Minister of the Ministry of Health and Environment of Iraq Dr. Jassim Al-Falahi and the representative of the Canadian Institute Dr. Karim Saher. The conference themes covered the relation between genetic resources and biodiversity, new technology for genetics resources conservation and protection, and the role of government and non-government entities on preserving the genetic resources.

Fig 2-5 Distribution of certificates of attendance at the genetic conference in Baghdad in March 2018.

http://agerciraq.wixsite.com/agerc/single-post/2018/03/28

Obstacles and scientific and technical needs related to the measure taken:

Obstacles:

1. Weak coordination between and among the ministries and the stakeholders as well as the lack of awareness among the decision makers on biodiversity have been major barriers.
2. The unstable security situation in many governorates (Kirkuk, Salah al-Din, Mosul, Anbar and Diyala) constrain them in organizing awareness campaigns and technical workshops.
3. Awareness programs and capacity building on biodiversity are not considered a priority as Iraq is still recovering from the political and security challenges.

Needs:

1. Further awareness-raising for decision-makers on biodiversity.
2. More engagement by researchers, academics and experts in relevant conferences and workshops.
3. More engagement of NGOs, communities and media in the awareness programs with gender consideration.
4. There is a need for financial support to achieve the action.

5. More involvement by the international agencies in disseminating good practices and experiences on different biodiversity disciplines.

NBSAP A.1.c: By 2016 groups, local associations and NGOs have been established to raise awareness among the local and public; also, schools, universities and the media are used to raise awareness among the locals and the public.

Measures taken to contribute to the implementation of the action

In 2017, four groups of provincial councils in Muthanna, Babil, Dhi Qar and Baghdad governorates were identified, including the following institutions: Environment Directorates, Directorates of Agriculture, Directorates of Water Resources, Education Directorates, NGOs, Local Media, the groups mandated on raising awareness of the communities, but due to shortage of financial resources, group members were unable to undertake awareness campaigns.

In 2016 the Central Statistical Organization (CSO) and the Kurdistan Region Statistical Office (KRSO) conducted the KAP survey (Knowledge, Attitudes and Practices of the Community Survey) about the uses of water and environmental aspects in Iraq. A total of 5202 people participated in the KAP survey: 3228 from urban areas and 1974 from rural. The survey targeted Iraqi societies in urban and rural areas to assess their knowledge, taking into consideration their sex (male and female), and the different regions in which people lived (south, middle and north). Sampling of participants also accounted for different ages and education backgrounds. All Iraqi's governorates were covered except two (Ninawa and Salah Aldin) because of the security conditions in these governorates at the time of the survey.
The full report of KAP is available on the SCO site /Environmental statistics/surveys *http://cosit.gov.iq/ar/env-stat/envi-stat.*
The KAP survey was conducted during the 1st quarter of 2016, with participation by 552 people, for the specific questions on biodiversity presented in the Table below:

Table 2-2 Examples of the questions on biodiversity in the 2016 KAP survey which sampled communities in both urban and rural areas.

Do you know what biodiversity means? **Yes or No**		
If **Yes** Answer these three questions		
Q1: If yes, what is biodiversity?	Q1A	Diversity in living organisms exist in Nature
	Q1B	The difference between terrestrial/land organisms and aquatic ecosystems
	Q1C	The diversity of the ecosystems that leads to biological diversity
	Q1D	Others, mention
Q2: What is the importance of biodiversity to human life?	Q2A	Contributes to human well-being and the sustainability of natural resources
	Q2B	Harms human well-being and the sustainability of natural resources
	Q2C	Has no impact on human well-being and the sustainability of natural resources
	Q2D	I don't know
Q3: How does biodiversity affected by water Scarcity?	Q3A	Its effect is beneficial
	Q3B	Its effect is harmful
	Q3C	Has no effect
	Q3D	I don't know

The outcomes of the survey are presented in the Figures below.

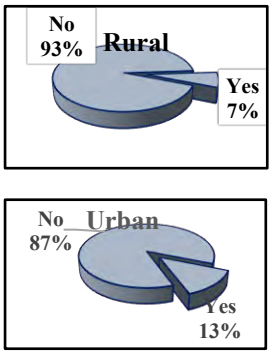

Figure 2-6

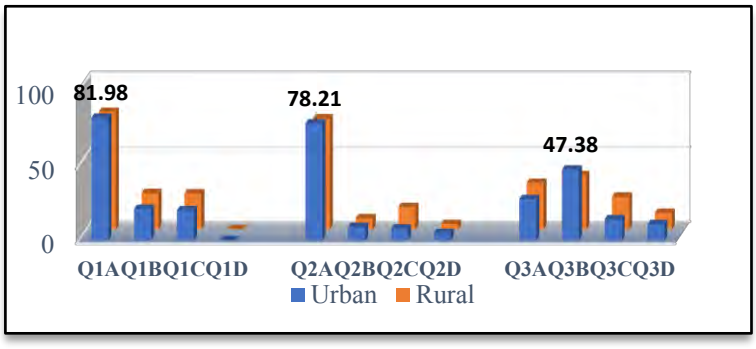

Figure 2-7

Figure 2-6: Percentages of responders (Urban, Rural) who reported that they understood the concept of biodiversity

Figure 2-7 Percentages of responders (Urban, Rural) to the questions on biodiversity

Presented in figure 2-7 from urban and rural areas (number of participants was 426 for urban and 126 for rural). The y-axis shows percentage of participants who responded positively.

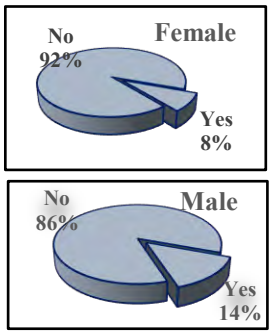

Figure 2-8

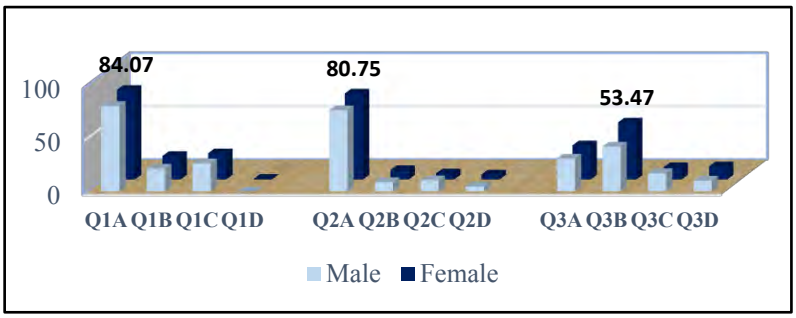

Figure 2-9

Figure 2-8 Percentages of responders (Male, Female) who self-reporting that they understood the concept of biodiversity,
Presented in Figure 2-9 from men and women (number of male participants was 317 and 181 females). The y-axis shows percentage of participants who responded positively.

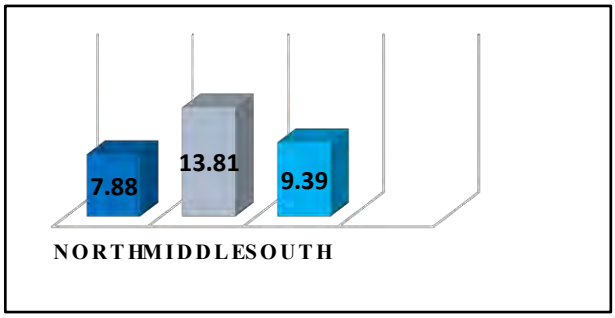

Figure 2-10 Percentage of responses who self-reported understanding the concept about biodiversity in different regions of Iraq.

Key conclusions:

1. Low reported rates about understanding of the concept of biodiversity; the average rate from responders was less than 15%.

2. The rates of responses based on locations and regions indicates that more efforts are needed on knowledge and awareness at local levels.

Contribution to the Aichi Biodiversity Targets or National Targets

NBT 1**:** By 2020, 25% of urban and rural people have awareness of the status of biodiversity, its benefits for people, the pressures that affect it, and the actions they can take for its conservation and sustainable use

Effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been ineffective

The reason of selection the measure's effectiveness

The measures taken to achieve this action was ineffective, because:
Only four groups were involved (four provinces) in raising awareness to the communities.
Although the target deadline was 2016, there is some progress since this date to continue establishing groups identified in this action from different sectors (e.g. other governorates) to undertake actions based on their mandates if enough resources are available.

Other relevant information

Case study on awareness targeted the community

One of the main activities undertaken by Nature Iraq (NGO) in 2016 is to encourage awareness and stewardship of Iraq's environment by promoting community-based environmental centers and clubs, developing education programs in Iraq, and maintaining global awareness of Iraq's environment.
One of the projects undertaken by Nature Iraq was: State of Birds in Iraq.
This project was implemented through a joint grant from the Aage V. Jensen Charity Foundation (AVJCF) and Nature Iraq, under the direct supervision of Birdlife International. The project aimed to assess the status of birds in Iraq with a focus on globally threatened species (as defined by IUCN) and birds that have national and regional significance. In addition, the report highlighted the endemic bird species in Iraq. This project began in March 2016. The report, once completed, will include recommendations and an action plan for individual bird species of high priority in Iraq. Furthermore, as part of this project, the team conducted awareness campaigns to protect Iraq's aviuna from illegal hunting in Iraq. Other activities were conducted under Birdlife International to assess the illegal killing in both Iraq and Iran and taking of birds across the Arab Peninsula, the project is ongoing as of December 2018.

Figure 2-11 Awareness campaign on illegal birds hunting targeted local communities

http://www.natureiraq.org/uploads/5/2/9/9/52997379/ni_activities_report_2016_english.pdf

MOA awareness to the women in rural areas

The Agricultural Irshad and Training Department in MoA, and through its awareness programs (using different awareness tools /TV, Radio programs, media and publications), advises female in rural areas about the methods of modern breeding of chickens, domestic birds and animals such as cattle, sheep, fish, and ways of establishing mussels. All these awareness activities are aimed at: (i) improving livelihoods ; (ii) developing knowledge in the use of new techniques and the correct scientific methods to cultivate highly certified varieties of agricultural crops; (iii) working to improve the level of knowledge and skills of farmers females in the field of management and breeding of milk cows; (iv) educating rural women on the importance of benefiting from the plant and animals residues;(v) Training the rural women to manufacture and revive heritage and popular products such as weaving rugs, woodwork and pottery and encouraging them to establish small production projects.

Obstacles and scientific and technical needs related to the measures taken:

Obstacles:

1. The Biodiversity and its importance is not considered as a priority among the decision makers and wide range of stakeholders.
2. Lack of concern by some ministries and institutions in responding to the surveys detailed for this action.
3. The unstable security situation in some governorates like (Kirkuk, Diyala, Mosul and Anbar) restricted the ability to carry out awareness activities and surveys.

Scientific and Technical Needs:

1. Capacity building for media institutions on their role in raising the awareness of ecosystem services and biodiversity conservation through communication programs.
2. Capacity building on the assessment of the impact of awareness programs in changing the local communities' attitudes towards biological conservation.
3. Enhance the role of NGOs and other organizations who can effectively target specific groups (e.g. farmers, fishermen etc), in disseminating environmental awareness.

Financial needs:

Financial resources are needed to support the implementation of awareness programs such as surveys, awareness tools, workshops and training courses.

NBSAP A.1.d: By 2018 develop, carry out research and distribute knowledge about the most important plants traditionally used as medicine (drugs).

Measures taken to contribute to the implementation of the action

Ancient Mesopotamians used a wide variety of plants for a range of medicinal, culinary uses (Potts 1997). In modern Mesopotamia, Marsh Arabs also use plants from the marshes for medicinal and healing purposes, including the following species: *Bacopa monniera*, *Cyperus rotundous*, *Ceratophyllum demersum*, *Nymphaea alba*, *Mentha aquatica*, *Nasturtium officinale* and *Phylla nodiflora* (*Amudhafar Fawzi, 2016*). Herbal medicine is a traditional, or folk, medicine practice based on the use of plants' seeds, berries, roots, leaves, barks, flowers and plant extracts for medicinal purposes. Many surveys have been done by traditional healers from the Erbil-Kurdistan region to highlight the traditional practices in the treatment of various disorders. The indigenous knowledge of local traditional healers and the native plants used for medicinal purposes were collected through questionnaire and personal interviews. Thirty-two plants belonging to 23 families were used to treat various diseases in traditional medicine. (see the Table 2-3 below) (*Aladdin Naqshbandi, 2014*).

Table 2-3. Plants used in traditional medicine in Erbil-Kurdistan region.

Botanical and Vernacular Names	Part used	Preparation	Medicinal Indications
Adiantum capillus- veneris (Adiantaceae), Kaetaran	LE	Decoction	Nephritis, Renal stone, Allergy, Preventing hair loss, Hypertension
Allium cepa (Liliaceae), Pewaz	BU	Decoction	Antioxidant, Enhancing immune defense, Reduce risk of infection
Allium sativum (Liliaceae), Seer	BU	Decoction	Hypertension , Hypercholesterolemia, Common cold, Antibacterial, Anticancer, Enhancing immunity
Andropogon sorghum(Gramineae), Reshale Ganmashame	Cornsilk	Decoction	Cystitis, Nephritis
Anethum graveolens (Umbelliferae), Shweet	LE	Decoction, Powdered in capsule	Hypercholesterolemia
Anthemis nobilis (Asteraceae), Gula Hajela	FL	Infusion, Inhalation, soap	Common cold, Antitussive, Reducing body temperature, Bronchitis, sinusitis, Sore throat, Hair tonic, Cleaning and opening pores of skin, healing of wounds, Acne
Artemisia campestris (Compositae), Sheeh	AP	Decoction, powdered in capsule	Hypercholesterolemia, Hypoglycemic Tonic for body, Analgesic Anthelmintic
Calendula officinalis (Asteraceae), Hamish Baha	LE	Decoction	Peptic ulcer, Appetizer, Regulation of menstrual cycle
Cassia acutifolia (Fabaceae), Senamake	LE	Infusion	Hemorrhoid, Laxative
Cichorium intybus (Compositae), Jakjaka	AP	Decoction	Blood purification, Hypercholesterolemia, Hypoglycemic, Hypertension, Allergy, UTI
Cinnamomum zeylanicum (Lauracae), Darjeen	BA	Decoction	Antibacterial , General tonic, Diuretic, Rena failure, Anemia, Sexual tonic for men
Citrus aurantifolia (Rutaceae), Lemo Basre	FR	Decoction	Tonic , Useful for kidney, liver, spleen and heart diseases, Diuretic
Citrus limonum (Rotaceae), Lemo	FR	Decoction	Renal stone
Commiphora myrrha (Burseraceae), Bneshta tal	Gum	Decoction	Peptic ulcer, Laxative
Corcus sativus (Iridaceae), Zafaran	FL	Infusion	Dyspepsia, Delaying menstrual cycle, Arthritis

Contribution to the Aichi Biodiversity Targets or National Targets

NBT 22: By the end of 2020, a survey of indigenous and local communities' traditional knowledge, use and practices relevant for the conservation and sustainable use of biodiversity is published.

Effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been ineffective

The reason of selection the measure's effectiveness

There are only a limited number of research documents about the most important plants traditionally used as medicine (drugs).

Relevant websites, web links and files

- *https://www.researchgate.net/publication/273352295_Plants_used_in_Iraqi_traditional_medicine_in_Erbil_-_Kurdistan_region*

Other relevant information

Case Study

Traditional uses of Kurdish medicinal plant *Pistacia atlantica* subsp. *Kurdica* Zohary in Ranya, Southern Kurdistan

Kurdistan is famous for the biodiversity of plants it supports, particularly the areas in southern Kurdistan. An ethno-botanical field study was conducted in 2016 via semi-structured interviews of 25 elderly informants to document traditional knowledge. The study focussed on the traditional use of the Kurdish medicinal plant *Pistacia atlantica* subsp. *kurdica* Zohary in Ranya city (located in Sulaymaniyah Province, Iraqi Kurdistan). Data was analysed by comparison with the ethno-botanical literature of Kurdistan. The use-value (UVd) index was developed and used to calculate the citation of diseases for single plant species. High UVd values were recorded for peptic and duodenal ulcers, dysentery, cholesterol (1, 0.48, 0.32, respectively). Also, the Kurds used this plant for many purposes, such as for the external application for skin problems, chewing it for cleansing of the mouth, relieving abdominal pain, relieving depression and for stress relief.

https://www.researchgate.net/publication/317003852_Traditional_uses_of_Kurdish_medicinal_plant_Pistacia_atlantica_subsp_kurdica_Zohary_in_Ranya_Southern_Kurdistan

Obstacles and scientific and technical needs related to the measure taken:

Obstacles:

1- Governorates that are subjected to high-security conditions (like Mosul, Anbar) cannot be covered by surveys.
2- Some communities at the local level have limited levels of TK.

Scientific needs:

1- The capacity building is needed for maintaining a database on TK and its value to the local communities.
2- Encourage researchers to integrate TK into scientific studies.

Technical needs:

1- Capacity Building on TK awareness for the local communities and across wider public/government.
2- There is a need to develop training programs to support local communities on the sustainable use of ecosystem products.
3- Economic studies on the value of TK to develop the livelihood of local communities and ecotourism.

Financial needs:

Financial resources are needed to conduct site surveys by the related authorities / researchers, and to support the activities mentioned above.

NBSAP A.1.e: By 2018 develop, research and distribute at all levels (from locals to policy makers) knowledge about the meaning, the importance and the sustainable use and management of ecosystem services.

Measures taken to contribute to the implementation of the action

Few numbers of scientific events:

1. A scientific symposium titled "Palm Pests" was held under the slogan "Our Palms Past and Future Wealth" by the Ministry of Higher Education and Scientific Research, University of Baghdad / Centre and Museum of Natural History; the symposium discussed the following:
    a. Insect pests that infect palms.
    b. Palm diseases and control.
    c. The most important non-insect pests of the palm.
    d. The role of agricultural quarantine in the conservation of palms.
2. A seminar was held under the slogan "Protection of Honey Bees: Protection for Man and the Environment" by the Ministry of Higher Education and Scientific Research, University of Baghdad, Centre and Museum of Natural History, where the symposium discussed the following axes:

    - Factors affecting bee activity.
    - Pests that affect the production and breeding of bees.
    - Environmental risk on bee's life and its habitat.

Contribution to the Aichi Biodiversity Targets or National Targets

NBT 1**:** By 2020, 25% of urban and rural people have awareness of the status of biodiversity, its benefits for people, the pressures that affect it, and the actions they can take for its conservation and sustainable use.

NBT 2: By 2020, 50% of policy makers and planners have awareness of the status of biodiversity, its benefits for people, the pressures that affect it, and the actions they can take for its conservation and sustainable use.

NBT 16: By the end of 2016, a national assessment is published of the state of provisioning, regulating and cultural services supplied by natural ecosystems and their importance for rural and urban people and on management options to be developed for the sustainable supply of ecosystem services.

Effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been ineffective

The reason of selection the measure's effectiveness

The measures taken was of limited effectiveness as ecosystem services is still a new concept in Iraq, and the national inventory of ecosystems services was not completed. In addition, there was only limited data available on ecosystem services, their values and sustainable resource use.

Relevant websites, web links and files

- *Brochure of symposium on Palm pests.pdf*
- *Brochure of symposium on protection of Honey bees.pdf*

http://www.moen.gov.iq /6NR/Awareness

Obstacles and scientific and technical needs related to the measures taken:

Obstacles:

1. Lack of interest by decision makers and wider stakeholders of the importance of ecosystem services and their economic benefits for Iraq. More specifically the development of the ecosystem services concept at all levels from decision makers to the local community, including farmers.
2. Lack of awareness on using ecosystem services in a sustainable manner, there have been many cases of using random fishing methods by illegal fishing techniques and fishing out of season.
3. Lack of concern by some ministries and institutions in responding to the surveys detailed for this action.
4. The unstable security situation in some governorates like (Kirkuk, Diyala, Mosul and Anbar) restricted the ability to carry out awareness activities and surveys on the importance of ecosystem services.
5. Limited knowledge on ecosystem services and biodiversity values among local communities.
6. Lack of a database on ecosystem services and biodiversity values.

Needs:

1. Capacity building on the assessments of ecosystem services and its value for the Iraq economy and local communities.
2. Capacity building on the assessment of the impact of awareness programs in changing the local communities' attitudes towards biological conservation.
3. Capacity building for the media institutions on their role in raising the awareness on ecosystem services and biodiversity conservation through communication programs and social media.
4. There is a need to develop an intensive program targeting NGOs and other local communities on the ecosystem values and the sustainable use of its assets.

Financial needs:
Financial resources are required to support implementation of above awareness programs.

NBSAP A.1.f: By the end of 2020, estimation has been made to know the percentage of people and policy makers /governmental employees who know about biodiversity by using questionnaires (specific and simple questions to reflect the general knowledge on biodiversity).

Measures taken to contribute to the implementation of the action
Knowledge assessment of basic concepts of biodiversity began in a survey in July 2018 which sampled across a number of governmental institutions and universities with the following steps:

1. A questionnaire consisting of 15 comprehensive questions was prepared, including all the national targets emanating from the Aichi targets for Iraq. These questions covered different concepts about biological diversity such as the importance of protecting endangered species, raising awareness on the importance of natural ecosystems services and the role of protected areas in the protection of habitats and threatened species (see Table 2-4 below). Targeted groups who were sampled included policy makers, governmental employees (technicians and administrators), students, academics and teachers with consideration of gender classification.

Table 2-4 The questionnaire given to participants included the following questions on biodiversity.

Question 1: Is Iraq bound by a biodiversity treaty and, if so, what is its name? Does it have a national biodiversity strategy?
Question 2: which of the following is not biological diversity :
Diversity of living Species
Diversity of living organisms
Diversity of ecosystems
Diversity in Climate Factors
Genetic diversity
Question 3: the benefits of biodiversity is to improve air quality and food quality from the below
Economic
Environmental
Medical
Question 4: One of the most important forms of recreational and tourism exploitation of
Collective hunting trips
Scientific documentary films
National Parks
Question 5: One of the following reasons does not lead to loss of
Natural Habitat loss
continuous climate change
Pollution
Over hunting
Question 6 : What do you know about the extinction of species?
Question 7: One of the reasons does not cause extinction:
Continental drift
Meteorites
Sustainable hunting
Climate Change
Question 8:Invasive alien species are:
They are authentic species useful to the environment and humans
They are authentic species useful to the environment and humans
Are non-indigenous organisms that cause damage to the environment, economy or health of the human being and are propagated outside their natural range

Question 9: What are the appropriate awareness tools to raise awareness among the public
Question 10: Local Endangered species mean:
Species threatened with extinction as a result of their competition for
Species that are threatened with extinction due to rotation seasons
Species threatened with extinction due to natural or artificial hazards
Question 11: The biological diversity is affected by pollution of :
Pollution of ecosystems by pests
Pollution of ecosystems through GMOs
Contamination of environmental systems with chemical pollutants from
Question 12: Are there any declared nature reserves in Iraq at the
Yes
No
Yes , under process
Question 13: Give examples of natural reserves declared on the
Question 14: Traditional knowledge of local people maintains
Far from modern technologies that result in collateral damage to
Represents an economic source for the local population
Far from military threats
Question 15: Which of the following services do not represent
Wood production
Genetic resources
Biochemicals
Resistance to invasive alien species
Recreational sites
atmospheric oxygen production
Capture carbon dioxide from the atmosphere
forming soil composition
Fisheries
Water Purification

2. The survey is in its preliminary stages, some results received from numbers of universities in four governorates.

Figure 2-12 below shows results from two targeted groups (University students' participation and government institutional staff).

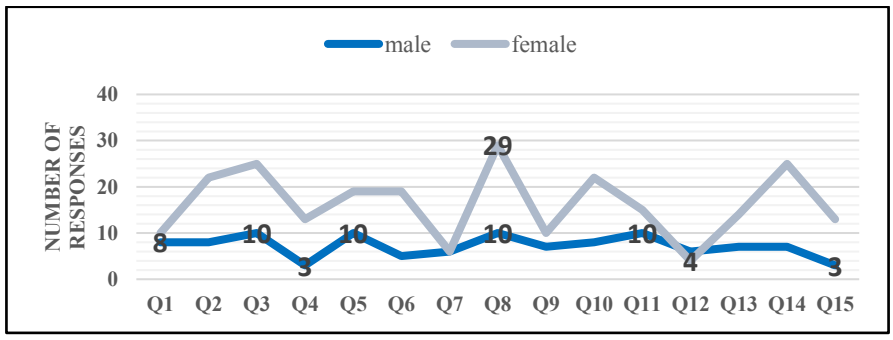

Figure 2-12 Responses from 43 students from the science college in Babel governorate on the questionnaire (11 men and 32 women).

The results show in figure 2-12 that there was a higher rate of female participation (74%). Based on the lower responses, it is recommended that the topics that would most benefit from knowledge enhancement are ecotourism, ecosystem services and National Parks.

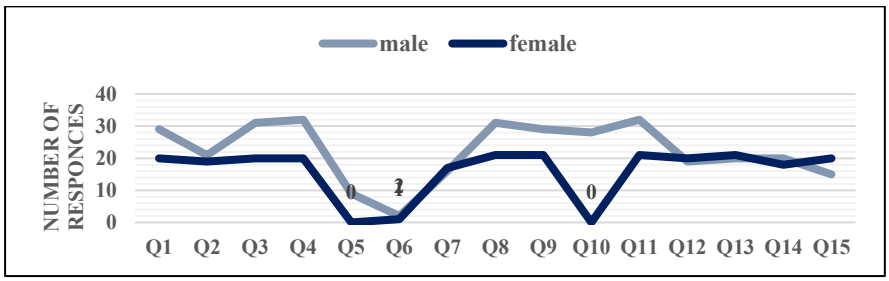

Figure 2-13. Responses from 54 Ministry of agriculture employees on the questionnaire (33 men, 21 women).

Higher rate of responses from men (61%) in the agricultural sector were reported (see Figure 2-13). Knowledge enhancement is needed across a range of areas (e.g. habitat loss, species extinction and endangered) the evaluation will be clearer after more data has been collected; the end of the survey will be in December 2019. .

Contribution to the Aichi Biodiversity Targets or National Targets

NBT 1: By 2020, 25% of urban and rural people have awareness of the status of biodiversity, its benefits for people, the pressures that affect it, and the actions they can take for its conservation and sustainable use.

NBT 2: By 2020, 50% of policy makers and planners have awareness of the status of biodiversity, its benefits for people, the pressures that affect it, and the actions they can take for its conservation and sustainable use.

The reason of selection the measure's effectiveness

☒ Measure taken has been effective

The reason of selection and tools / methodology for assessment of the effectiveness

MoHEnv survey targeting policy makers /governmental employees is in progress. Efforts are ongoing to meet the action deadline in 2020.

Obstacles:

1. Lack of interest by decision makers of the importance of biodiversity is the main obstacle.
2. Limited concerns of some ministries and institutions on responding to the surveys detailed in this action.
3. The unstable security situation in some governorates (e.g. Kirkuk, Diyala, Mosul and Anbar) restricted the ability to carry out awareness activities and surveys and achieving the action related to environmental awareness.

Scientific and Technical Needs:

1. The implementation of this action requires further capacity building for official (governmental) staff.
2. An assessment study of the impact of biodiversity knowledge-based programs.
3. The results of the awareness surveys on biodiversity knowledge must be taken into consideration by the ministries and academic institutions in the ministries' plans; this will enable proposed advocacy programs to be developed.

Financial needs:

Financial resources are required to support the implementation of the above

NBSAP A.1.g: By 2020 a national survey on the various ethnic groups of Iraq, their specific traditions and practices and their linkage with the conservation and sustainable use of biodiversity is published.

Measures taken to contribute to the implementation of the action

Kurdistan is an important region for human ecological and ethnobiological research, as it is home to significant archaeological sites tracing the history of plant use and is located at the crossroads of four important cultural areas (Turkish, Arabic, Persian, and Caucasian). In addition, the region still has diverse ethnic, linguistic, and religious minority groups who have lived peacefully together for centuries.

An ethnobotanical field study focusing on traditional wild vegetables was conducted in 22 villages of Central Kurdistan among three ethno-religious groups: Yazidis, Christian Assyrians, and (Sunni) Muslim Kurds. Through 91 interviews with elderly informants, the uses of 54 different botanical taxa were recorded. The results of the interviews also noted important differences among these groups in the use of wild vegetables due to the various main areas where the wild vegetables are collected specifically by the Muslim Kurds and Yazidis where they discover many species that grow in the mountains as a result of the dominance of pastoral activities in their economy Most of the wild food plants collected by the Assyrians, traditionally gardener, are artificial herbs clustered near their vineyards and olive groves. The preservation of the peaceful co-existence of different cultural and religious groups in the study area is crucial for the maintenance of the rich wild plant food local heritage. For more details review the website:

- *https://www.academia.edu/36043108/Celebrating_Multi-Religious_Co-Existence_in_Central_Kurdistan_the_BioCulturally_Diverse_Traditional_Gathering_of_Wild_Vegetables_among_Yazidis_Assyrians_and_Muslim_Kurds*

Contribution to the Aichi Biodiversity Targets or National Targets

NBT 22: By the end of 2020, a survey of indigenous and local communities' traditional knowledge, use and practices relevant for the conservation and sustainable use of biodiversity is published.

Effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been effective

The reason of selection the measure's effectiveness

There is no national survey on ethnic groups as they are locally distributed in certain regions in Iraq ,therefore some surveys achieved by interested researchers were used to provide information (see above). More efforts are needed to achieve this action as there is a shortage of research information about the relationships between the historical uses of native biodiversity by local communities.

Obstacles and scientific and technical needs related to the measures taken:

Obstacles:

1. Lack of interest on this specific subject among researchers and decision makers.
2. Absence of adequate knowledge base about TK

Needs:

1. More studies and surveys are needed about the engagement by local communities on the conservation and sustainable use of biodiversity; which needs to be replicated across different ethnic groups.
2. There is a need for financial support to expand the number of surveys and to cover a wider geographical spread across Iraq.
3. Capacity building on community levels on the sustainable used of biodiversity services.
4. Capacity building for the survey team to enable more data collection.

NBSAP A.1.h: By 2020, every governorate to produce a report about the traditional knowledge of their provincial-level local communities (such as the traditional crafts and any other traditional manifestation); to support initiatives for the launching and spreading of traditional components and to support the establishment of local NGOs of the traditional communities.

Measures taken to contribute to the implementation of the action

1. Five Environmental Directorates were involved in this target (Basra, Maysan, Thi-Qar, Ninawa and Kirkuk). Basic reports regarding TK were drafted by ethnic groups (Arab, Kurd and Turkman). A report from Kirkuk province outlined the TK of Arabic, Turkman and Kurdish communities living in different areas and how they interacted with the ecosystem.

2. A survey on economic and social status of inhabitants in the Arab Marshes from Basra, Maysan and Thi-Qar governorates in southern Iraq was achieved by the MoHEnv (see the link on the full study) information was collected on TK of the Marsh Arabs. The survey explained the integrative relationship between the indigenous locals of the Mesopotamian Marshes and their habitat. It also included how TK contributes to sustain biodiversity and ecosystem services in order to establish resilience towards environmental challenges. Craft manufacturing is an indicator of the originality and sustainability of the Marsh Arabs who still use methods developed many centuries in the past. The reed is considered as a significant raw material for rugs and hand-made carpets (Bariyah). However, some factories use Typha in paper manufacturing and special hand-made rugs.

3. Academic research articles concerning TK use in relation with native biodiversity and ecosystem have been published. However, few studies have explored the traditional use of native flora (medicinal plants) by the indigenous Kurdish local communities, particularly in southern Kurdistan.

Contribution to the Aichi Biodiversity Targets or National Targets

NBT 22: By the end of 2020, a survey of indigenous and local communities' traditional knowledge, use and practices relevant for the conservation and sustainable use of biodiversity is published.

Effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been partially effective

The reason of selection the measure's effectiveness

There were relatively few and sporadic national reports/surveys related to TK conducted. TK surveys were mainly confined to traditional practices by the Marsh Arabs (indigenous people of Mesopotamian Marshes). There was also a shortage of information provided by academic research concerning the relationships between TK of local communities with native
biodiversity in Iraq. More work is required in the next two years to meet the targets deadlines in 2020.

Relevant websites, web links and files

- *Traditional Knowledge in Kirkuk province.pdf*
- *Traditional Knowledge in Babel Province.pdf*
- *Economic and social status of Marshland villages in Mysan, Thi Qar and Basra provinces.pdf*

http://www.moen.gov.iq /6NR /studies and report

Other relevant information

Case Study

Effects of Mesopotamian Marsh (Iraq) desiccation on the cultural knowledge and livelihood of Marsh *Arab women*

The desiccation of the marshes has caused a drastic change in how Marsh Arab women interact with their environment; specifically, in comparison to the pre-desiccation period. Women's roles in the marshlands are increasingly limited to domestic rather than marsh-dependent activities. With the exeption of raising water buffalo and limited horticulture activities, most families today have little opportunity to utilize women's ability to generate income by applying their traditional ecological knowledge and skills. Furthermore, these women are no longer transmitting their marsh-specific knowledge and skills to the next generation, and these valuable and ancient cultural memories are being lost. Upstream dam construction, drought, and regional climate change is depriving Marsh Arab communities of marsh ecosystem services such as potable water, water buffalo forage, fish yields, and reed production. In marsh areas, where enough water remains to sustain ecosystem services (such as in Chibayish and the Iraq Marshlands National Park), cultural knowledge has been retained and passed on to the next generation. It was recommended that programs be implemented to preserve these traditional skills such as boat manufacturing, hunting equipment, house building, use of plants to cure disease (i.e. medicinal plants) and hand crafts to develop a market for handicrafts to support women and their families, and to support cultural knowledge. Otherwise, with the passing of the older generation, these remnants of ancient Sumerian knowledge and traditional ways of life will soon be forgotten.

https://esajournals.onlinelibrary.wiley.com/doi/full/10.1002/ehs2.1207

Obstacles and scientific and technical needs related to the measure taken:

Obstacles:

1. Security condition in a number of Iraqi governorates (e.g. Mosul, Anbar) is the main obstacle to conducting surveys, and engaging local communities.
2. TK is considered a relatively new concept for research and so more interest is needed by researchers and NGOs.

Scientific needs:

1. A comprehensive database about TK is required and joint efforts by NGOs, local communities and related stakeholders.
2. TK needs to be integrated into ecological science.
3. Assessment studies on the economic benefits of natural habitats (incorporating TK) so as social benefits to the local communities.

Technical needs:

1. Capacity Building/education program on TK issues needs to target local communities and can be facilitated by NGO groups.
2. Capacity building for the youth, women in local communities on the economic feasibility of the ecological benefits provided by natural habitats (including traditional assets) in each governorate.
3. Site surveys and assessment studies need to be published on the knowledge, attitudes and practices of communities related to traditional knowledge in different areas in Iraq.
4. Need capacity building to document case studies and undertake advocacy programs.

Financial needs

There is a need for financial support to expand the experiences and practices outlined above.

NBSAP A.2.a: By the end of 2014 a decree is issued for the establishment of protected areas in Iraq.

Measures taken to contribute to the implementation of the action

By the end of 2014, legislation was issued to establish protected areas in Iraq. A national committee of relevant Iraqi ministries was formed including MoHEnv, MoA, MoWR, MoHESR and MoTA, in cooperation with NI (NGO) to draft legislation about protected areas. The official procedures were adopted in the ratification of the legislation and then it was published in the Iraqi Gazette No. 2 of 2014. The legislation included the institutional structure for the nomination and approval of protected areas, plans to manage them and the preparation of awareness programs in coordination with the local population and related organizations.

Contribution to the Aichi Biodiversity Targets or National Targets

NBT 12: By the end of 2014, a regulation is issued for the establishment of protected areas in Iraq.

Effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been effective

The reason of selection the measure's effectiveness

Completion of legislation for the establishment and protection of protected areas was became law in 2014.

Relevant websites, web links and files

- *Protected areas law No. 2 of 2014 .pdf*

http://www.moen.gov.iq /6NR/Legislation

Other relevant information,

The next stage of establishing a protected area network is the formal ratification of more sites. Currently there are 23 protected areas in Iraq listed in https://www.protectedplanet.net/country/IQ (see Figure 2-15). In total these 23 sites protect 1.53% of the land area of Iraq (which equates to a land area Protected of 6,714km^2 of total land area 437,831 km^2). The 23 sites comprise the following: 2 National Parks (Sakran mountain by KRG approval and Central Marshes by Federal government approval), 16 Nature Reserves and 4 Ramsar sites (Hammar Marsh; Haweezah Marsh; Central Marsh; and Sawa Lake) and 1 World Heritage Site (both Ramsar and World Heritage site are protected at the International level). The only areas that have been designated so far are the following 5 sites: Sawa Lake; Central Marsh; Hammar Marsh; Haweezah Marsh; (Barzan Area is subjected to KRG approval). The remaining 18 sites have been proposed but have not so been formally ratified.

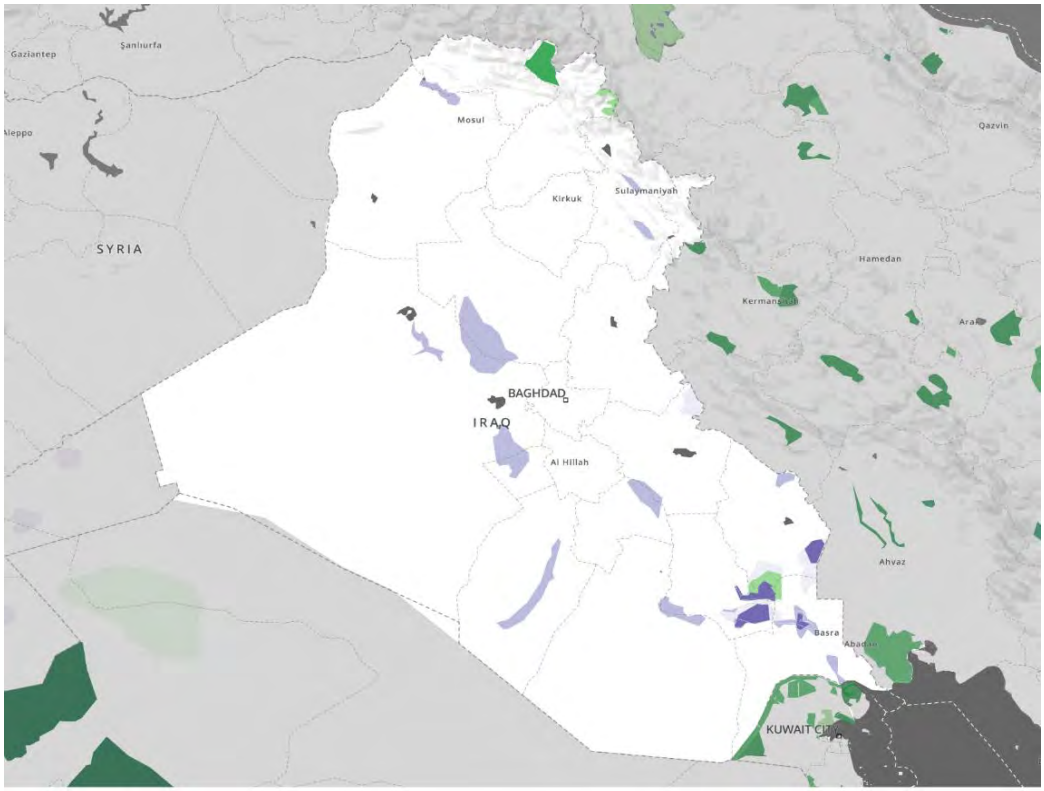

Figure 2-14 Map showing the 23 protected areas in Iraq as shown on the IUCN protected areas database (data downloaded on 05/11/2018). Important to note that only 5 of these sites are shown as designated whilst the other sites are proposed but not reported as designated (as of 05/11/2018). Dark Green = Category IV site (Barzan Nature reserve); light Green =Category II site (Sakran Mountain and Central Marshes National Parks); the light and dark blue sites are not assigned to specific IUCN Categories

Obstacles and scientific and technical needs related to the measure taken:

There were no obstacles to the establishment of the legislation.

NBSAP A.2.b: By end of 2015 assess the forestry legislation currently in force and identify the gaps.

NBSAP A.2.i: By 2018 amend the old forestry legislation and enforce the new provisions

Measures taken to contribute to the implementation of the actions
These two actions are related to each other, measures taken are as follows**:**

The MoA is the entity responsible in Iraq for the protection, maintenance and improvement of lands and forests, to increase the extent of green areas (and thus improve the environment and combat desertification). In the federal Government, the responsibility covered 15 governorates.

In the regional government of Kurdistan in the north of Iraq, MoAWR is the entity responsible to protect and maintain the forests in that region.

Existing and effective forest legislation have been compiled and reviewed by both entities mentioned above, as follows:

- Legislation of the Forestry and Trees Area, the *Law No. 30 of 2009* issued by the Federal Government / Ministry of Agriculture.
- Legislation of the Kurdistan Forest, the *Law No. 10 of 2012* issued by the Kurdistan Regional Government/Ministry of water resources and agriculture.
- Instruction *No 8. of 2013* issued based on article (25) of Kurdistan Forest Law, stated that the concerned authorities must complete processes on identifying the forests area for developing the green area through planting trees. It also spelt out the legal commitments and obligations for establishment of any project near the forest and on compensation in case of damages such as tree-logging or forest-fire.

Diagnosis of gaps in the laws set out above revealed the following:

- No gaps in the Law No. 30 of 2009 by the opinion of the Ministry's experts, measures taken by the Council of Ministers to enforce this law is authorizing the Minister of Interior to form a regiment or special group called (Forest Police) to protect forests from abuses.in KRG also the police are involved on law enforcement in the forest areas.
- No gaps in the Law no.10 of 2012.

Contribution to the Aichi Biodiversity Targets or National Targets

NBT 8: By the end of 2020 legislation has been enacted to address major pressures on forest ecosystems and their local species and to promote their sustainable management, restoration and conservation.

Effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been effective (for both A.2.b and A.2.i)

The reason of selection the measure's effectiveness

The existence of laws in force in both the federal government and the Kurdistan Regional Government are sufficient to maintain forests and according to the opinion of the competent authorities in both governments.

Relevant websites, web links and files

- *Forest and trees area law no 30 on 2009 .pdf*
- *Forest law in KRG no 10 on 2012.pdf*

http://www.moen.gov.iq /6NR/legislation

Obstacles and scientific and technical needs related to the measure taken:

Obstacles:

1. Awareness on the importance of forest biodiversity by communities is an obstacle, as most of the local people think of forests services as their own assets.
2. Legal enforcement against the abusers of forests has been very weak.

Technical needs:

1. More studies and adequate reflection of laws concerning forests in the legislative approach to ecotourism and climate change.
2. The existing laws need to be revisited based on the updated context in terms of forest degradation trends and forest database.
3. Exchange knowledge and experiences from other countries in the field of forest management and legislation.
4. Awareness campaigns for the forest communities about conservation and laws for protection and associated guidelines.

Financial needs:

Inadequate financing to support above needs.

NBSAP A.2.c: By the end of 2016 identified all the governmental bodies concerned with the control and management of invasive alien species

NBSAP A.2.e: By 2017 Issue legislation to control the introduction and dispersal of non-native species

Measures taken to contribute to the implementation of the action

The two actions are related to each other, measures taken are:

Governmental authorities responsible for the control and management of invasive alien species are: MoHEnv, MoA, MoHESR, MoTrade, MoF/ General Authority of Customs. After the NBSAP (2015-2020) was adopted officially. A technical team from the mentioned authorities was formed in 2017 (there was a delay in populating this team after the administrative change that occurred in the MoEnv) and achieved the following:

1. Collection of available data (including expert opinions) on alien and invasive species.
2. Draft of instructions for the control of alien and invasive species (IAS) in Iraq that include:

a. Establishment of a registry of alien and invasive species, to be updated every two years;
b. Instructions on the import of IAS such as the prohibition of any admissions of AIS that have impacts on ecosystems and habitats, IAS risk analysis, import/export AIS certifications;
c. Assignment authorities on conducting researches and studies about IAS;
d. Regulations on IAS control measures, and
e. Monitoring /inspections across the Iraqi borders.

In this legislation, the roles of each responsible entity were identified.

Progress - The draft legislation that resulted from this work described above was sent to the relevant authorities in the Iraq government in 2017 but has not yet been adopted.

Contribution to the Aichi Biodiversity Targets or National Targets

NBT 18**:** By the end of 2017, legislation is enacted to control the introduction and diffusion of non-native species into the natural environment.

NBT 19: By the end of 2020 the list of invasive species of Iraq and their impacts and invasion pathways have been published.

Effectiveness of the implementation measures taken in achieving desired outcomes

☒ Measure taken has been effective, for the A.2c action

☒ Measure taken has been partially effective, for the A.2.e Action

The reason of selection the measure's effectiveness

For Action A.2.c
The governmental authorities from key stakeholders were identified in 2017 not 2016 for the reason stated above.

For Action A.2.e
The draft legislation has been drafted and sent to the relevant authorities of the Iraqi Government for review in 2017 but it has not yet been adopted.

The difference in time between the completion of the draft legislation and the formal adoption of the legal documents was because of the differences in legal and administrative procedures required to pass the legislation. The legislation is currently still under review by the State Consultative Council (which will enable formal ratification in Iraq and declaration in the official Gazette).

Obstacles and scientific and technical needs related to the measure taken:

For A.2.e Action

Obstacles:
The legislative process in Iraq has been very slow and the legal requirement for effective conservation and biodiversity management is yet to be considered as a high priority.

Needs:
Awareness and capacity building by the legal departments and the parliamentarians have become an urgent need. Support from the international community and access to best-practice is an important requirement to facilitate drafting IAS legislation in Iraq.

NBSAP A.2.d: By 2016 assessing current environmental standards and identify gaps that need to be addressed. By 2020 environmental standards and limitations are issued to address the identified gaps.

Measures taken to contribute to the implementation of the action

The issuance and updating of environmental legislation to protect the environment from physical and chemical contaminants that directly or indirectly harm the environment and cause damage to humans or other living organisms is a clear priority. Iraq has national policies and strategies to control pollutants, but this is an on-going process.

Identifying permissible limits for the concentration of each pollutant are based on Environmental Protection and Improvement Law no. 27 of 2009 in Federal Government. and on Law No 8 for 2008 in KRG.

Main legislation related to pollutants that have impacts on the environment and to natural ecosystems are listed below, including the new and updated legislation.

1. *Water Resources Conservation Regulations No. 2 of 2001:* the regulation aims to protect water resources from all kinds of pollution (liquid or solid) disposed by any industry, agriculture and service activities, including imposition penalties against those accused of dumping pollutants (such as toxic, dangerous or radioactive waste) into water resources or services networks. Local authorities are engaged in establishing environment protection local plans.
2. *Regulations on rivers conservation No. 25 of 1967:* includes the permissible concentrations of physical and chemical substances (SO4, TDS, CL, and heavy metals etc.) disposed into rivers (e.g. Tigris, Euphrates, and Shatt al-Arab), streams, lakes and marshes.
3. *National regulations of permissible limits of air pollutants in ambient air No.2 of 2018* (updated recently) related to the pollutants emitted from any activity such as, solid waste incinerators, hazardous and medical waste incinerators, sources of hydrocarbon combustion, including (SO2, NO2, CO, O3, TDS, Pb, dioxins and furans).
4. *National regulations for the use of treated sewage water in agricultural irrigation No. 3 of 2012:* includes several conditions related to the use of treated wastewater in agricultural irrigation and the standards of treated wastewater used for agricultural irrigation to prevent surface and groundwater pollution.
5. *Regulation on ambient air protection from pollution No.4 of 2012:* identifies the role of the MoHEnv in reducing pollution, including establishing the national monitoring program, air pollutants guidelines and

measuring methods, instructions for reducing pollutants and details the mandate of the Environment Observer.

6. *Instructions for the use of treated sludge in agriculture No. 1 of 2016:* aims to clarify the treatment of sludge resulting from wastewater treatment and the most suitable conditions for using sludge in agriculture.
7. *Hazardous Waste Management Regulations No. 3 of 2015:* these regulations specify the procedures to be followed when disposing of hazardous waste products and the obligations to be followed for the transfer of hazardous wastes, as well as the necessary precautions and procedures to ensure that no environmental damage occurs.
8. *The Environmental Protection Regulations of Municipal Waste No. 2 of 2014*: includes procedures to be used for the environmentally sound management of solid wastes and the prevention of dumping them randomly, especially into rivers.
9. *Law No. 8 of 2008 Environmental Protection and Improvement in the KRG:* aims to maintain the environment of KRG by protecting, improving, developing and preventing it from pollution.
10. *Instructions No. 2 of 2011 for Ambient Air Quality Protection from hazardous and common air pollutants in KRG*: this identified the permissible levels of air pollutants in ambient air, pollutants from industry and fuel incineration, hazardous air pollutants including measures needed to reduce air pollution.

National standards for the concentrations of contaminants in the soil are being prepared by the MoHEnv in coordination with the Geological Survey Board through the survey of Iraqi soil for all governorates in Iraq and measuring concentrations of soil trace elements (e.g. Pb, Ni, Hg, Cr, Co. etc.). The analysis of results from this sampling is currently under review in order to agree on the national thresholds for the acceptable levels of these elements in the soil.

Contribution to the Aichi Biodiversity Targets or National Targets

NBT 11**:** By the end of 2018 environmental standards are issued and enforced for prevention and control of priority pollutants in the natural ecosystems (not altered by human intervention).

Effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been ineffective

The reason of selection the measure's effectiveness

There is no comprehensive assessment for all environmental standards held up to 2016, but each standard is treated individually and updated in case of any gaps raised.

Relevant websites, web links and files.

- *Water Conservation Regulations No. 2 of 2001 .pdf*
- *Rivers Conservation Regulation No.25 of 1967.pdf*
- *National Regulations for Permissible Limits of Air Pollutants in Ambient Air No.2 of 2018.pdf*
- *National Regulations of the Use of Treated Sewage Water in Agricultural Irrigation No.3 of 2012.pdf*
- *Regulation on Ambient Air Protection from Pollution No.4 of 2012 .pdf*
- *Hazardous Waste Management Regulations No.3 of 2015.pdf*
- *Instructions for the Use of Treated Sludge in Agriculture No.1of 2016.pdf*
- *The Environmental Protection Regulations of Municipal Waste No.2 of 2014.pdf*
- *Environmental Legislation Guides in KRG Region .pdf*

  http://www.moen.gov.iq /6NR/legislation

Obstacles and scientific and technical needs related to the measure taken
Obstacles:

1. Lack of national expertise on drafting legislation for pollutants affecting natural, semi-natural and modified ecosystems.
2. Continued changes in the experienced staff in key stakeholders' organisations is considered a major barrier.
3. Database of pollutants are the main basis for new/updated legislation and guidelines; shortage of a central database repository is identified as a challenge.
4. Routine procedural processes contribute to the delay in the adoption of any legislation.

Scientific needs:

1. Historical data and information on pollutants are needed to inform updated legislation.
2. More research and studies on pollutant concentrations in Iraqi ecosystems, which are considered as key background information for the legislation.

Technical needs:
Capacity building for the development of biodiversity-related laws and bylaws are needed.

Financial needs:
Financial resources are required to support the above actions.

NBSAP A.2.f: By 2016 an evaluation of the effectiveness of the legislation currently in force about threatened species is carried out and by 2020 legislation for the conservation of threatened species is issued and enforced.

Measures taken to contribute to the implementation of the action
This action is supported by a number of enforced national policies and legislation that include information on species status and conservation in Iraq up to date such as:

1. The Iraqi Environmental Law No.27 of 2009.
2. Law of Protection of Wild Animals No.17 of 2010.
3. Regulation and instructions to arrange ecotourism in the Marshlands) drafted in 2018.
4. Law of National Parks No.2 of 2014.
5. Issuing Hunting Instructions in Marshlands No.2 of 2017 on conservation of biodiversity in Marshes.
6. The Republic of Iraq ratified to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) on 2016.
7. Iraq is a signatory state for the Convention on the Conservation of Migratory Species of Wild Animals (CMS) based on Law No. 29 for 2016.

Measures taken to contribute to the implementation of the action

1. National committee was established to review and evaluate the applicable laws and addressing the weakness in their application.
2. A technical team of stakeholders was established to draft a legislation on conservation of threatened species, the draft covered the following items:
   a. Initiation list of local endangered species, to be updated on annual basis.
   b. Measures taken by authorised entities on:
      - Prevention of overexploitation of local endangered species in local market and prevention of

trafficking.
- Revocation of the hunting certificates for the of local endangered species.
- Monitoring/confiscation of locally threatened species taken from the environment to be return to their original habitat.

c. Consideration of threatened species risk during development projects establishment in natural habitats.
d. Evaluation and consideration of remediation of the habitats exposed to damage caused by disasters.

Legislation has been drafted (focused on the above) and submitted to the Council of Ministers for approval.
Through Waterkeepers Environmental Law and advocacy project, related legislation adopted by (KRG), as follows:

1. Environmental Protection and Improvement in KRG Law No. 8 of 2008.
2. Law on Protection of Wild Animals and Birds No. 21 of 1979.
3. Act of Natural Pastures No. 2 of 1983.
4. Instructions No.117 of 1987, for organizing of grazing at natural pastures.
5. Resolution No.463 of 1989 to ban deer hunting all over Iraq.
6. Regulation No.9 of 2011 for establishment of Natural Reserves in KRG and its management.
7. Act of Forests in KRG No.10 of 2012.

No updated actions have been taken in KRG.

Contribution to the Aichi Biodiversity Targets or National Targets

NBT 21**:** By 2020 legislation for the conservation of threatened species is issued and enforced

Effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been partially effective.

The reason of selection the measure's effectiveness

Some of the legislation are in place but whether it is effective or not is not yet known.

The legislation for threatened species was drafted in 2018 and will be adopted by the Council of Ministries, issued and enforced before the Target deadline 2020.

Obstacles and scientific and technical needs related to the measure taken:

Obstacles:

1. Inadequate legal capacity and limited experience in drafting legislation for the conservation of threatened species.
2. Limited information base and the challenge to treat biodiversity as a national priority when the country is still recovering from the worst level of devastation caused by ISIS.

Technical needs:

1. Technical assistance and support from the specialised organizations are urgently required to build capacities of the legal departments for drafting legal provisions for threatened species in Iraq.
2. Access to examples of international best-practice are an important requirement for this process.
3. A comprehensive assessment of the effectiveness of current legislation is important to determine the gaps and barriers for effective enforcement of the environmental laws in Iraq.

Financial needs:

Iraq will need external financial assistance to support the above actions. The country's economy is still coping with the challenge to address the urgent need for reconstruction, peace and stability.

Relevant websites, web links and files

- *Law No 27 of 2009 for protection and improvement of environment .pdf*
- *Law of Protection of Wild Animals No.17 of 2010*
- *Iraq Waterkeeper Environmental Law and Advocacy Project.pdf*
- *Protected Areas Law No 2 of 2014.pdf*
- *Regulation of hunting instructions in Marshlands No 2 of 2012 on conservation of biodiversity in Marshes pdf*
- *The law of Iraq's acceded to CMS No 29 of 2016.pdf*

http://www.moen.gov.iq /6NR/legislation

NBSAP A.2.g: By 2016 determine the services provided by natural ecosystems that are used by rural and urban people and by 2018 a strategy should be developed and in place to use sustainably the ecosystems that supply important services to urban and rural people.

Measures taken to contribute to the implementation of the action

Most ecosystem services that contribute to the well-being of people living in urban and rural areas were identified in Table 7 of the NBSAP (2015-2020). Updated information (not included in the NBSAP) is shown in yellow in the Table 2-5 below.

Table 2-5 Updated list of ecosystem services from different ecoregions in Iraq.

A. Provisioning Services

Ecosystem Service	Tigris-Euphrates Alluvial Salt Marsh	Arabian Desert And East Sahero-Arabian Xeric Shrublands	Mesopotamian Shrub Desert	Middle East Steppe	Zagros Mountains Forest Steppe	Maritime coast (Somali - Arabian province)
	PROVISIONING (FOOD, FRESH WATER, FUEL, WOOD AND FIBER)					
1.Food production Including crops, livestock, fisheries, aquaculture and wild foods	Fish and cattle Meat, , Poultry Eggs, Vegetables and Beans, Summer Fruits, Dates, Wheat and Barley Crops, rice Crop, Maize Crop, Plant Products, Milk and Dairy Products	Pasture for livestock, orchards, Vegetables and legumes, Summer fruits, Citrus fruits, Dates, Agricultural fields Wheat and barley crops, Shrub crops, Sun flower, Cotton crop, Maize crop, Poultry breeding fields, Milk and dairy	Agricultural products and forage for livestock, vegetables and legumes, summer fruits, citrus fruits, dates, wheat and barley crops, sun flower crop, potato crop, poultry breeding fields, milk and dairy products	Agricultural products and forage for livestock, vegetables, legumes and oil crops, summer fruits, wheat and barley crops, sun flower crop, potato crop	Agricultural products, vines, nuts, Pistachio, wild onion, The young leaves of some Wild herb plants, seeds and the acorns	Fish and sea food, Seaweeds as of important sources of macronutrients such as protein, fiber , carbohydrates , lipids , minerals and vitamins

		products				
2.Water for domestic needs	A plentiful source of fresh surface water (swamps) Fresh rivers	Ground sources, fresh water	River catchment area, storage reservoirs	River, catchment area, lakes	Catchment area, mountain rivers and streams	Nearby marshes and Shatt-al-Arab
3.Fisheries	Large freshwater fish stocks	-	Fish stock and Aquaculture	Fish stock and Aquaculture	-	Diverse marine fish fauna
4. Fresh water Inland water bodies, groundwater, rainwater and surface water for agricultural uses.	Surface water (Swamps) Fresh rivers	Ground sources, fresh water	Rain and storage reservoirs, Fresh rivers, Seasonal rainwater, Groundwater	Freshwater rivers, Seasonal rainwater, Groundwater	Rain and storage reservoirs	Nearby marshes and Shatt-al-Arab, Ground water
5. Resources of raw industrial materials Biological raw materials of timber and other wood products, fibers, resins, animal skins, sand and ornamental resources	Various plant and animal products	Desert plants	Industrial crops and animal products	Industrial crops and animal products	Plant and animal products	Materials for industrial production
	1 -Raw materials 2. Raw materials in intermediate industries 3. Raw materials in small industries Raw materials in industries for the year 2015 Raw materials in industry for the year 2016					
6. Genetic resources Genetics and genetic information used for animal breeding, plant improvement, and Biotechnology	Plant and animal endemic species	- Plant and animal endemic Species, Insects used in criminal detection	Plant and animal endemic species	Plant and animal endemic species	Plant and animal endemic species	Plant and animal endemic species.
7. Biochemicals, natural medicines and pharmaceuticals	From natural plants	From natural plants	Natural and medicinal plants	Natural and medicinal plants	Natural and medicinal plants	Natural and medicinal plants, Seaweeds
8. Biofuels Biological materials derived from living organisms - plants and	Animal residues	Shrubbery				

animals - used as energy sources Examples: fuelwood, coal, dung, and grain for ethanol production						

B. Regulating Services

Ecosystem Service	**Tigris-Euphrates Alluvial Salt Marsh**	**Arabian Desert And East Sahero-Arabian Xeric Shrublands**	**Mesopotamian Shrub Deser**	**Middle East Steppe**	**Zagros Mountains Forest Steppe**	**maritime coast (Somali - Arabian provice)**
	REGULATING (CLIMATE, FLOOD, DISEASE AND CONTROL, WATER PURIFICATION)					
1.Regulate the water cycle and maintaining long-term water cycling	Large reserves of fresh and ground water	Large reserves of ground water	Large reserves of fresh and ground water	Large reserves of fresh and ground water	Large reserves of fresh and ground water	Large water volume reserve
2.Regulate floods	Managed wetlands to absorb floods	Man-made small dams	Reservoirs with high storage capacity	Reservoirs with high storage capacity	Reservoirs with high storage capacity	Natural tidal wetlands to regulate flooding events
3.Reduce climate change impacts	Hydrological cycle, freshwater reservoir, flood absorption, carbon storage	-	-	-	Hydrological cycle, carbon storage	Coastal wetlands protect from storms and sea-level rise and erosion
4.Regulation of soil leaching	Effective role	-	Effective role	Effective role	Effective role	Effective role
5.Filtering and water purification	Surface water	Ground water	-	-	Surface water	Surface water
6.Capturing carbon dioxide from the atmosphere	Effective	-	Moderate	Moderate	Effective	Effective
7. Fisheries	Large natural stocks	-	Large stocks	Large stocks	Large stocks	Large stocks
8.Invasion Resistance	Diverse habitat but highly vulnerable	Harsh environment less vulnerable to alien species	Vulnerable to alien species	Vulnerable to alien species	Vulnerable to alien species	Vulnerable to alien species
9. Sewage treatment	Biological water treatment	Biological water treatment plants				

	plants and agricultural uses of waste	and agricultural uses of waste				
10. Pollination plants	Effective by insects	Effective by insects	Effective by insects			
11.Biological control	Effective by insects	Effective by insects	Effective by insects		Effective by insects	

C. Cultural Services

Ecosystem Service	**Tigris-Euphrates Alluvial Salt Marsh**	**Arabian Desert And East Sahero-Arabian Xeric Shrublands**	**Mesopotamian Shrub Desert**	**Middle East Steppe**	**Zagros Mountains Forest Steppe**	**maritime coast (Somali - Arabian provice)**
	3. CULTURAL (AESTHETIC, SPIRITUAL, EDUCATIONAL, RECREATIONAL)					
1.Natural surrounding	Unique	High quality	High quality	High quality	High quality	High quality
2.Scenic values	Very high value	High value	High value	High value	Very High value	High value
3.Tranquility	High	High	High	High	High	Tranquil
4.Religious values	Various shrine sites	Various shrine sites	Various shrine sites	Various shrine sites	Various shrine sites	-
	Potentially high quality	Ecotourism and game birds and mammals	Ecotourism and game birds	Ecotourism and game birds	Ecotourism and game birds and mammals	Ecotourism and fishing

D.Supporting services

Ecosystem Service	**Tigris-Euphrates Alluvial Salt Marsh**	**Arabian Desert And East Sahero-Arabian Xeric Shrublands**	**Mesopotamian Shrub Desert**	**Middle East Steppe**	**Zagros Mountains Forest Steppe**	**maritime coast (Somali - Arabian provice)**
	4. SUPPORTING (NUTRIENT CYCLING, SOIL FORMATION, PRIMARY PRODUCTION)					
1.Nutrient cycling	High	Low	Medium	Medium	Medium	High
2.Production of atmospheric oxygen	High	Low	Low	Medium	High	Medium
3.Soil forming	Fast	Slow	Normal	Normal	Fast	Fast

4.Primary production	High	Low	Medium	Medium	High	High
5 - scientific indication	Insects used as indicators of environmental quality	Insects used as indicators of environmental quality			Insects used as indicators of environmental quality	

The updated information is based on the following references:

I. World Wild Life organization for the ecosystems adopted in Iraq.
II. Academic researches

- *Augul, R. S., 2016. Insect pollinators in different regions of Iraq. Journal of Entomology and Zoology Studies; 4(2): 391-402*
- *Augul, R. S., 2018. Study on diversity of Bees (Hymenoptra, Apoidea) from different regions of Iraq Bull. Iraq nat. Hist. Mus. (2018) 15 (1): 57-75.*
- *Al –Saffar, H. H., 2016. A revised checklist of the Robber fly genera (Diptera, Asilidae) from Iraq.Bull. Iraq nat.Hist.Mus.14(1):215-222A*
- *Augul, R. S., Al –Saffar, H. H., 2018. Survey and Taxonomical Study of Ants that collected from indoor in different regions of Iraq. Journal of Biodiversity and Environmental Sciences (JBES). Vol. 12, No. 3, p. 93-97.*
- *Al –Saffar, H. H., 2017. Survey to the species of family swpsidae (Insecta: Diptera) in Iraq International Journal of Science and Research (IJSR), Volume 6 Issue 6, p. 1086-1088.*
- *Augul, R. S., Al-Hashmi, A. H., Al –Saffar, H. H., 2016.New record of the Epaulet skimmer: Orthetrum Chrysostigma (Burmeister) (Odonata: Libellulidae) from Iraq:. Journal of Biodiversity and Environmental Sciences (JBES), Vol. 8, No. 5, p. 233-238.*

III. Ministry of planning / central board of statistics-Environmental and agriculture statistic
http://cosit.gov.iq/ar/agri-stat

Strategy for implementing sustainable use of ecosystem Services in Iraq

There is no strategy drafted but the following legislation are considered as supporting materials in developing a strategy to safeguard the long-term sustainable use of ecosystem services as described here.

The measures (legislation) below (1-3) relate specifically to the Ecoregion Tigris-Euphrates Alluvial Salt Marsh.

1. The regulations governing hunting in marshes No.2 of 2017, is issued to prevent overhunting of endangered species, sustainable use of natural resources (e.g. birds and fish) to ensure food security for local people.
2. Issuing the instruction of granting approval for environmental projects that potentially impact World Heritage properties (e.g. marshland sites selected by UNESCO) to preserve the safety of the property and its ecosystem.
3. Preparation of a draft on (2018) of the regulation on environmental tourism in natural sites and properties of the World Heritage, to be adopted soon.
4. Drafting the guidelines to control the presence of alien invasive species in Iraq, to maintain ecosystems and services in Iraq from the threats of alien invasive species. This legislation is currently under review by legal council.
5. Regulations on control of fish breeding (aquaculture) using floating cages in the water bodies and closed lakes in Iraq to reduce the impacts on wild-caught fish; these regulations are under the control of agriculture, environment and water resources authorities.

Contribution to the Aichi Biodiversity Targets or National Targets

NBT 16**:** By the end of 2016, a national assessment is published of the state of provisioning, regulating and cultural services supplied by natural ecosystems and their importance for rural and urban people and on management options to be developed for the sustainable supply of ecosystem services.

NBT17: By the end of 2018 a national strategy/sub-national strategy is established for the sustainable management of ecosystems to supply important ecosystem services for rural and urban people.

Effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been ineffective

The reason of selection the measure's effectiveness

This measure was set as ineffective as the list of ecosystem services was only updated, with no classification of their use by rural and urban people. No strategy was developed for the use of ecosystems services in a sustainable way; instead the quantity of different legislation was used as an indicator.

Relevant websites, web links and files.

- *The Fishing regulations in the Marshlands No 2 of 2017. (In Arabic).pdf.*
- *Controls for granting environmental approval to environmental projects that affect the World Heritage property (in Arabic).pdf*
- *Draft Regulations for the Regulation of Tourism in the Natural and World Heritage Sites of 2018. (In Arabic).pdf*
- *Controls and mechanisms for the installation of floating cages to raise fish in the water bodies in Iraq. (Arabic).pdf*
- *Control on Fish breeding using closed system. (Arabic).pdf*

http://www.moen.gov.iq /6NR/regulations

Other relevant information

Case Study

Ethnobotany of the Hawraman region of Kurdistan Iraq

The medicinal plants represent one of the provisioning services supplied by ecosystems in Iraq. In the Hawraman region, southern Kurdistan, which is located in the Zagros mountains forest steppe Ecoregion, 64 plant species, belonging to 30 families, were studied through an ethnobotanical survey which characterized various traditional uses, including local foods, medicines, tools, gums, fodder, tanning, and dyes. The ethnobotanical compilation presented is based on information from the local elderly generation via recorded interviews, the purchase and photography of artefacts from craftsmen shops, and documentation throughout the year of the native wild plants on sale in the markets of Hawraman towns and villages. Medically, the leaves, rhizomes, root, leaves, and flowers are used in treatments for many diseases. Some examples of medicinal plants in Hawraman region: Adiantum Capillus-Veneris L. (Pteridaceae), Ammi Majus L. (Apiaceae; K: danpakrawa), Alcea Kurdica (Schlecht.) Alef., Althaea Officinalis L. (both Malvaceae) Althaea Cannabina L., Anchusa Italica (Boraginaceae; K: Gozrwan).

https://huh.harvard.edu/files/herbaria/files/20_1_85_ahmad_askari.pdf

Obstacles and scientific and technical needs related to the measure taken

Obstacles:

1. Poor level of knowledge, information and understanding of the concept of ecosystem services and the economic value derived from the biodiversity.

2. Lack of assessment and studies on ecosystem services and their uses by rural and urban communities.
3. Lack of national expertise on drafting strategies about ecosystem services.
4. Funding support is the main obstacle to achieve the above actions.

Requirements:

1. Undertake studies and assessment of critical ecosystem services in Iraq.
2. Establishment of a geographical database of major ecosystem services in Iraq and identify threats to natural ecosystems and their services.

NBSAP A.2.h: By 2018 Amend existing legislation or develop a new regulation for the protection of lands from desertification risk and restoration of desertified lands, thereby providing special measures to protect restored lands.

Measures taken to contribute to the implementation of the action

A regulation draft entitled "Reducing Desertification for the Conservation of Biological Diversity" has been prepared through the formation of a technical team of stakeholders from (MoHEnv/ Natural Ecosystems Department, Water and Soil Monitoring Department), MoHESR/ University of Baghdad, MoA/ Forestry and Desertification Control, MoWR. The draft highlighted the specificity of desertification as a threat to biodiversity and established a number of requirements to protect biodiversity from the desertification impact. The draft highlighted:

- The measures to be taken by the executive entity to reduce desertification, for example sand dune stabilization, planting trees, use of modern irrigation and harvesting technologies.
- Mandates of each entity (Environment, water resources and agriculture) to combat desertification.
- List of actions to protect biodiversity and land from degradation.

The draft is currently under review by the relevant authorities of the Iraqi Government.

On providing special measures to protect restored lands, GEF funded project (Sustainable Land Management for Sustainable Livelihoods in the Degraded Areas of Iraq) is initiated to implement this action. The aim of the project is to sustainably manage and use globally significant ecosystems, and to reduce land degradation and conserve marshland ecosystems in Iraq for improved livelihoods and ecosystem resilience and services. It will also develop a package of modifications in agricultural policies and legislation for conservation agriculture as mentioned in Project Component 1/Outcome 1.1. The project will be implemented with FAO support in October 2019.

Contribution to the Aichi Biodiversity Targets or National Targets

NBT 9: By the end of 2020, about 1,000 square km of desertified shrub land and grassland have been restored.

NBT 6: By the end of 2020, the reasons for loss and degradation (i.e. the species that used to be present in that habitat are not there anymore, and the services that the people expected or used are reduced or absent) of each of the natural (not altered by human intervention), semi-natural and human modified habitats of Iraq have been identified to inform conservation actions.

Effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been partially effective

The reason of selection the measure's effectiveness

Draft legislation has been prepared. It is still in the process of ratification, and land restoration project implementation has been delayed for some technical issues, both measures did not meet the action deadline.

Relevant websites, web links and files

- *Project Identification Form: Sustainable Land Management for Sustainable Livelihoods in the Degraded Areas of Iraq. Pdf*

http://www.moen.gov.iq /6NR/studies and reports

Obstacles and scientific and technical needs related to the measure taken:

Obstacles:

1. Limited experience in drafting legislation.
2. Endorsement of legislation concerned with biodiversity is a major challenge because the issue is not a high priority.

Needs:

1. Capacity building in drafting legislation: support is needed from related specialized organizations.
2. Assessment of the effectiveness of current legislation to identify areas of strength and weakness.
3. Building capacity of government employees from the relevant authorities on the assessment of current legislation related to land degradation and desertification.
4. Technical and financial support by the international organizations to address the above actions.

NBSAP A.2.j: By 2018 Cross-sectoral Guidelines for sustainable use (of natural resources) and sustainable production and consumption methods are drafted to be integrated into relevant sectoral policies

Measures taken to contribute to the implementation of the action

Iraq has a solid base of legislation aimed at protecting and using natural resources in a sustainable manner. In the (NBSAP A .2. g), a variety of different legislation included information about the sustainable use of natural resources. The regulations on control hunting in marshes No. 2 of 2017, is to sustain use of natural resources (e.g. fish and birds), also the instruction on fish breeding (aquaculture) using floating cages in the water bodies and closed lakes as a method of sustainable production for food security in addition to reducing the threat impact on the wild-caught fish in Iraqi waters.
In MoA who is responsible for food security, there are legislation concerned with use of aquatic resources and local wildlife (Law No. 48 of 1976 & Law No.21 of 1979). There is also legislation about exploitation of agricultural lands, and on crops and other dietary products, highlighted in the MoA annual plans and water resources policies. To ensure the water quantities required for domestic, agriculture and industrial consumption, in addition to the water allocation in the marshland, water balance is considered in the MoWR plans and strategies. So, each sector has its own policies and benefits; a comprehensive cross-sectorial policy is recommended to realise potential synergies.

Contribution to the Aichi Biodiversity Targets or National Targets

NBT16**:** By the end of 2016, a national assessment is published of the state of provisioning, regulating and cultural services supplied by natural ecosystems and their importance for rural and urban people and on management options to be developed for the sustainable supply of ecosystem services.
Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes.

NBT 17: By the end of 2018 a national strategy/sub-national strategy are established for the sustainable management of ecosystems to supply important ecosystem services for rural and urban people.

Effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been ineffective

The reason of selection the measure's effectiveness

The action was not achieved within the deadline.

Obstacles and scientific and technical needs related to the measure taken:

Obstacles:

1. Lack of interest among decision makers.
2. Poor capacities in drafting the guidelines.
3. Financial support is an obstacle.
4. Limited coordination and cooperation amongst and between relevant institutions and stakeholders.

Needs:
Technical support will be required to embark on an initiative for stakeholders' engagement.

NBSAP A.3.a: By 2016 the purposes and values of the ten proposed PAs have been identified and by the end of 2020 ten new protected areas have been gazetted and established. Within one year from the PAs establishment the management plan is defined (in accordance with the National legislation on PAs and with international guidelines, including identification of values and criteria, the PAs qualifying for AZE18 sites, the management authority, the funds, the staff, the social aspects etc.).

Measures taken to contribute to the implementation of the action
Eighteen protected areas (see table 2-6 below) were proposed through a vote of the National Commission for protected areas, which is formed under the Protected Areas Law No.2 of 2014. These proposed areas are still under ratification by the related authorities for declaring them officially in the official Iraqi gazette. However, one of the sites listed below (Central Marshlands) was declared by the federal government as protected area in 2013

under the name of the National Park in the Marshlands of Mesopotamia. Five sites are formally designated as protected sites (see Figure 2-14).

Table 2-6: showing the proposed natural protected sites and the name of the environmental zone (KBA).

#	Proposed site	Ecoregion	Classification by IUCN
1	Dalmaj Marsh	Arabian desert and east Sahero- Arabian Xerik Shrubland	Natural reserve
2	Mosul Lake	Middle east Steppe	Natural reserve
3	Peramagroon Mountain	Zagros Mountain forest Steppe	Natural reserve
4	Razzaza Lake	Arabian desert and east Sahero- Arabian Xerik Shrubland	Natural reserve
5	Tharthar Lake & Dhebaeji Field	Mesopotamian Shrub desert	Natural reserve
6	West Hammar	Tigris-Euphrates alluvial salt Marsh	Natural reserve
7	Khor Al-Zubair Marshes	South Iran Nubo- Sindian desert and semi desert	Natural reserve
8	Qara Dagh	Zagros Mountain forest Steppe	Natural reserve
9	Wadi Al-W'eir & Sh'eeb Abu-Talha	Arabian desert and east Sahero- Arabian Xerik Shrubland	Natural reserve
10	Haditha Wetland and Baghdadi	Mesopotamian Shrub desert	Natural reserve
11	Teeb Oasis & Zubaidaat	South Iran Nubo- Sindian desert and semi desert&Tigris-Euphrates alluvial salt Marsh	Natural reserve
12	Barzan Area and Gali Balnda	Zagros Mountain forest Steppe	Natural reserve
13	Al-Qosh	Zagros Mountain forest Steppe	Natural reserve
14	Badra and Zurbatiyah	South Iran Nubo- Sindian desert and semi desert& Mesopotamian Shrub desert& Tigris-Euphrates alluvial salt Marsh	Natural reserve
15	East Hammar	Tigris-Euphrates alluvial salt Marsh	Natural reserve
16	Coral reef in marine area (new site)	Arabian Gulf	n/a
17	Suwaibaat (or Sleibaat)	Arabian desert and east Sahero- Arabian Xerik Shrubland& Tigris-Euphrates alluvial salt Marsh	Natural reserve
18	Sakran Mountain	Zagros Mountain forest Steppe	National Park
19	Sawa lake	Arabian desert and east Sahero- Arabian Xerik Shrubland	Ramsar site
20	The Ahwar of Southern Iraq		World heritage site
21	Hawizeh Marsh		Ramsar site
22	Hammar lake		Ramsar site
23	Central Marshes		National Park and Ramsar site

Please note that some of these sites are not (yet) shown in the Protected Area database.

Representatives from the International Union for the Conservation of Nature (IUCN)/ the Regional Office for West Asia, MoHEnv, UN-Environment, and (GEF) met in Amman in 23 Nov 2017, to launch the "Initial Steps to Form a Network of National Protected Areas in Iraq". The GEF-funded project aims to ensure effective management improvement of existing and future protected areas in Iraq as a means of preserving biodiversity and sustainable use in the country

Fig 2-15 Project team of "Preliminary Steps to form a Network of National Protected Areasin Iraq Nov.2017

Contribution to the Aichi Biodiversity Targets or National Targets

NBT 15: Establish ten new protected areas.

Effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been partially effective.

The reason of selection the measure's effectiveness

Measure taken has been partially effective due to:

1. There are five Protected Areas already ratified (see World Protected Database – accessed on 24/04/2019).
2. Eighteen further Protected Areas were proposed by the National Committee for Protected Areas. This represents the achievement of the first part of the executive program for this action.
3. The second part of the implementation program for this action, which relates to the identification of protected area management plans, in accordance with national legislation on protected areas and international guidelines, including the definition of values and standards, competent local authorities for sites, management authority, funds and personnel, has not been achieved.

Moving forward it is helpful to use the connectedness between protected areas as a measure of the linkages between the network of sites (e.g. see Figure 2-17).

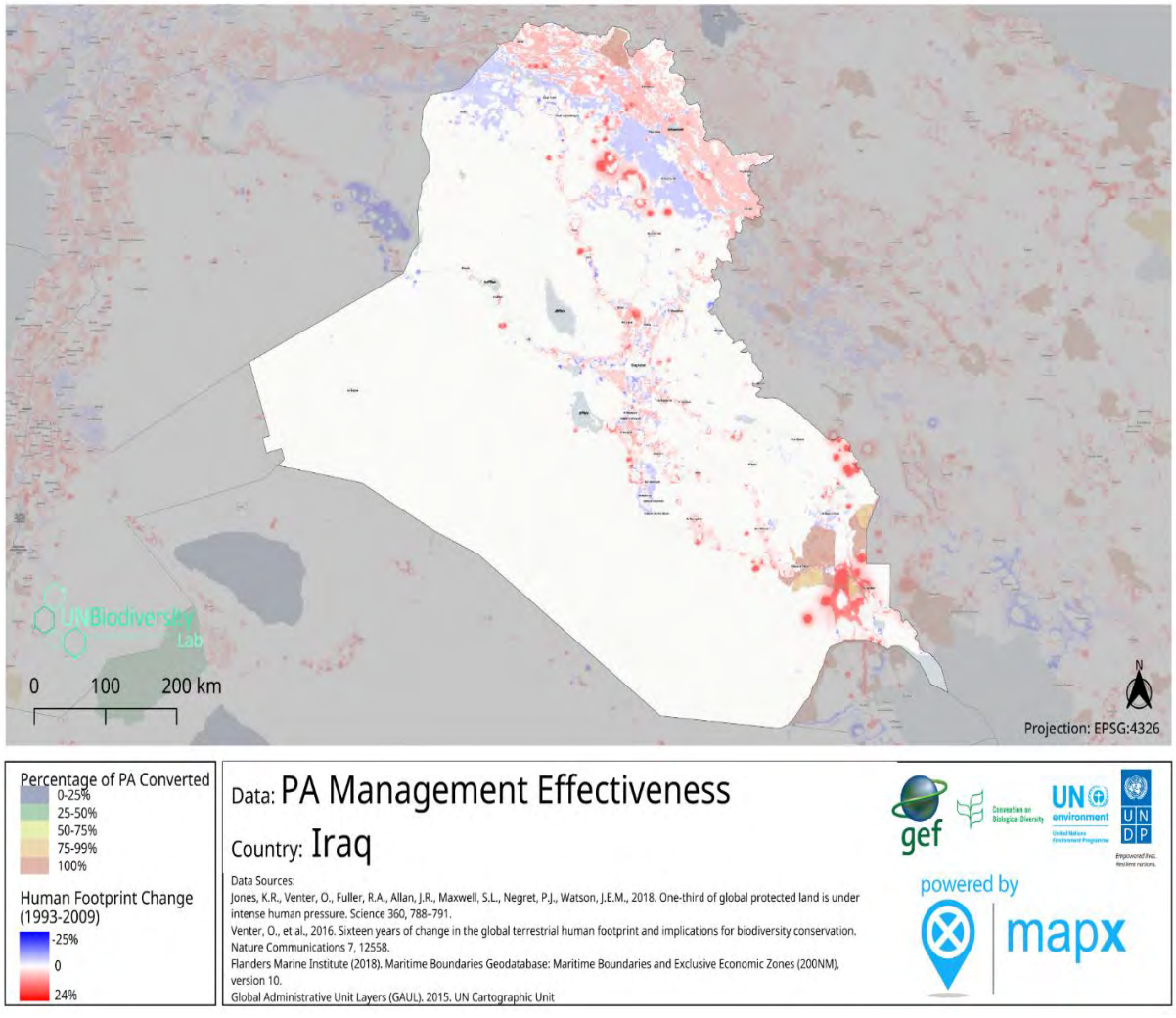

Figure 2-16 small proportion of Iraq's land area currently covered by protected areas. Note areas in brown show locations of protected areas; areas in white, pink and blue also indicate the absence of protected areas. The management plans are only available for three protected areas in the protected area database, https://www.protectedplanet.net/country/IQ, accessed on 24/04/2019).

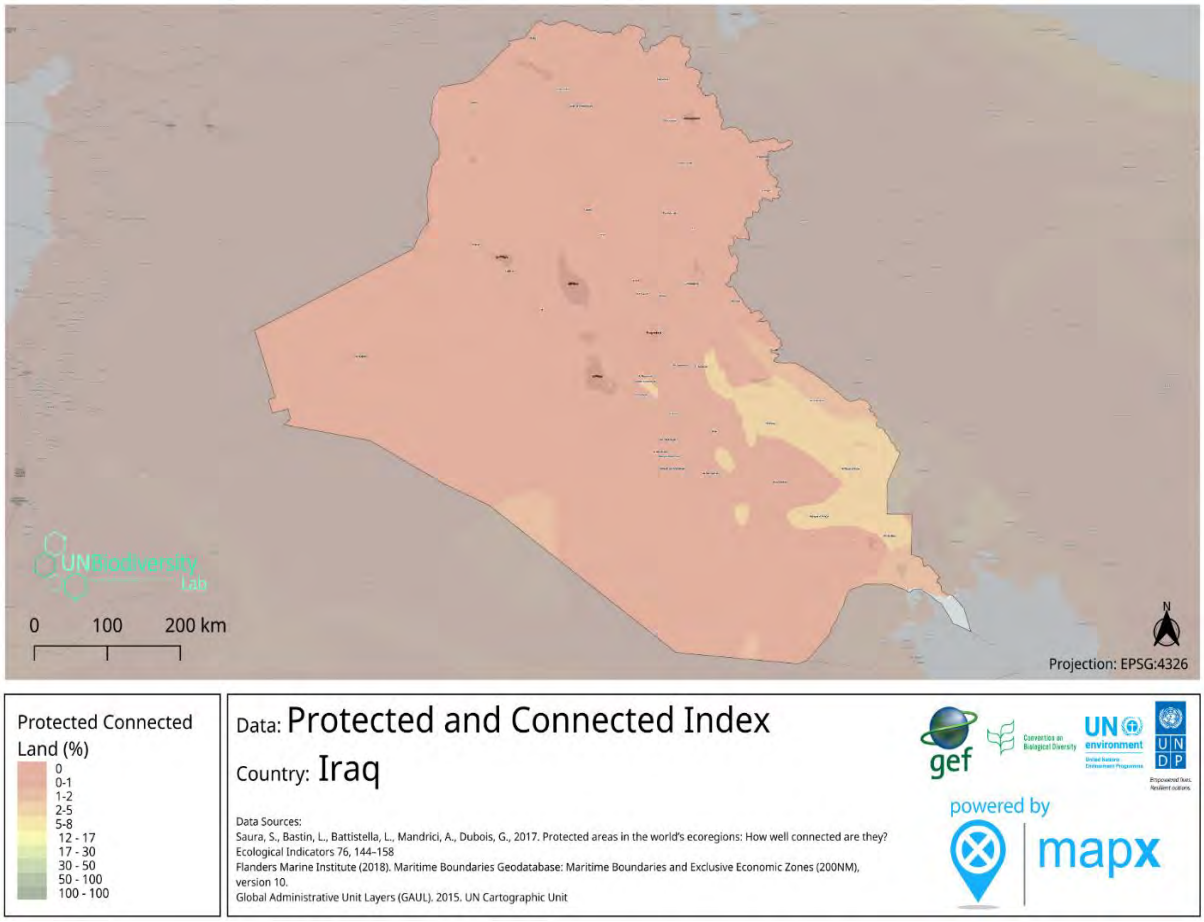

Figure 2-17 the connectedness between protected areas in Iraq is either absent or very low. This metric is a useful tool to indicate progress (now and in the future) of connectedness (an important measure of resilience for a protected area to support wildlife populations)

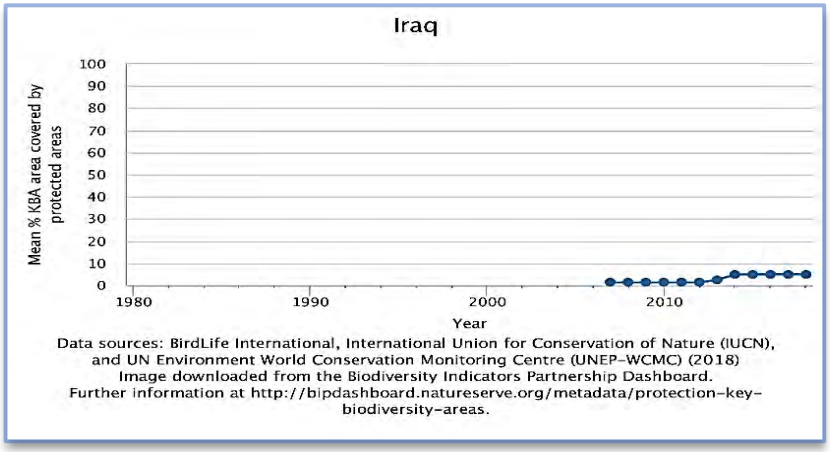

Figure 2-18 The percentage of Key Biodiversity Areas (KBAs) that are afforded protection within the protected area network in Iraq. The small land area protected will grow as more sites are identified and then formally ratified

Other related information

Case study on local communities' engagement in protecting their Protected Site

One site in Iraqi Kurdistan, the Barzan Area, in Kurdistan region is noteworthy for having, until recently, only informal environmental protection. Protected since the early 20th century through tribal prohibition and controls on hunting and habitat use, this KBA site covers an area of over 110,000 hectares representing approximately 4% of the Zagros Mountains Forest Steppe (PA0446) ecoregion in Iraq. The benefit of long-term protection for this extensive area can be seen in the fact that this is one of the few sites in Iraq where a large population of the globally Vulnerable Wild Goat *Capra aegagrus* can easily be seen. It is a noteworthy lesson that the Barzan protected area, which has achieved a relatively high level of protection since the beginning of the last century, was created only by local community agreement.

(Source: KBA assessment 2017)

Fig 2-19 Road sign upon entering the Barzan Area (IQ004) posted by the KEPIC in Erbil @A Bachmann/NI

Obstacles and scientific and technical needs related to the measure taken:

Obstacles:

1. The length of time it takes for the process of ratification of new protected areas (PAs) is a major obstacle.
2. Limited experience of creating comprehensive management plans for PAs.
3. Security conditions restricted field surveys, especially in Mosul and Anbar governorates.

Scientific needs:

1. Surveys and data collection programs on more parts of Iraq for potential future protected areas.
2. Monitoring programs for existing biodiversity areas sites identified by the KBA study.
3. Research on natural resources in PAs.
4.

Technical needs:

1. Intensive capacity building program for all stakeholders (on national and local levels) on PAs (social, environment and economic) assessment, and the sustainable natural resources management and planning, including engagement of NGOs, media and local communities with due consideration given to gender in processes.

2. Training on drafting project proposals.
3. Decision makers involvement for better understanding of the value of PAs.

Financial needs:
Financial support to achieve the actions listed above.

NBSAP A.3.b: By 2017, the list of endangered species in Iraq has been published, the data on their numbers and the primary threats affecting these species are provided for the conservation measures and the formulation of plan of action. By 2020, the Action Plan had been finalized.

Measures taken to contribute to the implementation of the action

(1) Programmes and Initiatives
Five programmes are related to the action (some of them are directly related, refer to (a) and (b) below however, (c), (d), (e) are indirectly related).

(a) The first step in implementing Action A.3.b was forming a national committee chaired by MoHEnv in August 2017 to produce a national list of threatened species in Iraq.

(b) Biodiversity data collection was carried out for species of flora and fauna, for endemic plants that exist in Iraq based on published researches within websites listed below, and the classification of those species threatened with extinction are shown in the Table 2-7 below.

Table 2-7 List of Flora and Fauna in Iraq with degree of threats based on published research.

Class	Threatened			Near Threatened (NT)	Total of Threatened and Near Threatened species
	Critically Endangered (CR)	Endangered (EN)	Vulnerable (VU)		
Vertebrates					
Mammals	-	4	13	8	25
Birds	3	6	11	23	43
Reptiles	2	4	3	2	11
Amphibians	1	-	1	-	2
Fresh Water Fishes	4	1	6	-	11
Marine Fishes	2	9	14	23	48
Plants (including endemic plants)	8	27	57	7	99
Invertebrates					
Anthozoa	-	-	13	27	40
Insects	-	-	3	3	6
Bivalvia	1	-	-	2	3
Total	21	51	121	95	288

Based on this list, the total number of threatened and near-threatened species (fauna and flora including endemic plants) in Iraq total 288 species (193 species are classified as either “Critically Endangered”, “Endangered” or “Vulnerable”, and 95 species are “Near Threatened”).

Please note that this information differs from that presented in the IUCN Red List database (https://www.iucnredlist.org/search - accessed on 22/05/2019) which reports the totals in each threat category across all taxa: Critically Endangered (7); Endangered (20); Vulnerable (56); with a further 76 classified as ‘Near-Threatened’.

The checklists were seen in the KBA surveys in Iraq included:

Table 2-8 Iraq's Key Biodiversity Areas book in 2017, which highlights threatened species conservation status.

Class	Critically Endangered	Endangered	Vulnerable	Near to Threatened	Total
Mammals		2	5	2	9
Reptiles		1	2	1	4
Amphibians	1		1	1	3
Total					16
Eighty-five fish species (59 freshwater and 26 marine species) were recorded by the KBA surveys and by subsequent surveys conducted by Dr. Jorg Freyh of the Leibniz-Institute of Freshwater Ecology and Inland Fisheries in Germany, which included					
Class	Critically Endangered	Endangered	Vulnerable	Near to Threatened	Total
Freshwater fish	3	-	5	1	9
Marine Fish	-	-	-	1	1

(c) Protected Areas (PAs) have a major role in species conservation. Iraq has developed a program to create and expand a protected area network (see NBSAP A.3.a).

(d) The ecotourism regulations will be crucial to minimize the main threats and impacts on threatened species and habitats. Measures taken included forming a national committee to develop regulations and best practice for ecotourism in the Mesopotamian Marshes (the first site designated as a PA). This committee is populated by representatives of relevant NGOs and relevant Ministries: Health& Environment, Tourism and Archaeology; Planning; Higher Education; Agriculture.

(e) The impact of climate change on species was evaluated in the adaptation and vulnerability measures section of Iraq's Initial National Communication INC, one of Iraq's national requirements to UNFCCC; in addition, a committee for National Adaptation Plan has been formed by MoHEnv in June 2018.

(2) Policies and Legislation

Further information about policies and legislation of threatened species is covered in (NBSAP A.2.f).

Contribution to the Aichi Biodiversity Targets or National Targets

NBT 20**:** By the end of 2020 the list of threatened species of Iraq has been published and an action plan for the conservation of priority species is produced

Effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been partially effective

The reason of selection the measure's effectiveness

Pressures on biodiversity in Iraq have increased since the publication of the last national biodiversity report (5th national report and NBSAP). For example, the highest temperatures ever recorded in Iraq were in 2014 and 2015 and these were associated with substantial decreases in precipitation. In addition, Iraq has faced severe water scarcity issues due to hydrological projects in adjacent countries (where discharge from upstream has fallen dramatically due to the infrastructures projects, such as dams), which caused drought, habitat loss, and subsequent changes in socio-economic conditions.

According to the changes outlined above there is an urgent need to update the list of threatened species of the country. However, the ability to complete all the necessary actions taken to achieve the National Target

requirements were impacted by the critical security circumstances in Iraq. Therefore, the effectiveness of the Action A.3.b was scored as "partial effectiveness". The timeline of Action A.3.b was an implementation phase between 2017 to 2020. Therefore, progress is approximately 50% in 2018 with two years left for completion. Despite the difficulties mentioned above, the government succeeded in completing a list of the threatened species of fauna in Iraq which includes lists of national and global threatened species in Iraq (see Annex 2).

In addition, the government has developed legislation regarding the threatened species of Iraq (see NBSAP Action A.2.f) and taken important steps to protect the species and their habitat (for instance, the Mesopotamian Marshlands were selected and nominated as a World Heritage site in 2016).

Despite the existence of effective wildlife/environmental protection legislation/laws, the implementation still is not fully applied due to weak enforcement and incomplete up-to-date checklists of species. Therefore, more field research/surveys, capacity building, and financial resources are needed in the next two years of the implementation process.

Relevant websites, web links and files

- *KBA*

https://www.amazon.com/Key-Biodiversity-Areas-Iraq-Nature/dp/0988651467

- *Iraq's initial national communication to UNFCCC.pdf*

http://www.moen.gov.iq /6NR/studies and reports

- *https://reliefweb.int/sites/reliefweb.int/files/resources/Climate%20change%20In%20Iraq%20Fact%20sheet%20-%20English.pdf*
- *https://www.researchgate.net/publication/280606885_Checklist_of_the_Mammals_of_Iraq_Chordata_Mammalia*
- *http:/www.Moen.Gov.Iq/Portals/11/Status-Of-Euphrates-Soft-Shelled-Turtle-Rafetus-Euphraticus-In-The-Iraqi-Central-Marsh%20.Pdf*
- *https://www.researchgate.net/publication/320076208_Annotated_Checklist_to_the_Birds_of_Iraq*
- *https://www.researchgate.net/publication/325879533_Annotated_checklist_of_reptilian_fauna_of_basrah_south_of_Iraq*
- *https://www.researchgate.net/publication/328650602_Checklist_of_the_fishes_of_the_newly_discovered_coral_reef_in_Iraq_north-west_Arabian_Gulf_with_10_new_records_to_the_Arabian_Gulf*

Other relevant information

Case Study

The Mesopotamian Marshes were nominated as a UNESCO World Heritage site based on its biological and archaeological values. Prior to 2014, the Iraqi authorities nominated four wetlands as Ramsar sites. In addition, Iraq's first national park (Central Marshes) was declared in 2013. As a result of this designation MoHEn recommended that the Marshes component was selected within the heritage list due to the outcomes of many studies, and many academic articles focused on species and habitat published between 2014 and 2018.The occurrence of many animal and plant species have been an important part of the nomination of the Mesopotamian Marshes as a UNESCO World Heritage site. The persistence in occurrence of Iraq's Smooth-coated Otter, Lutrogale perspicillata maxwelli, after the marshlands flooded again in 2003 represented a remarkable recovery of this endemic flagship species in Iraq. The study of the Al- Sheikhly et al. (2013) recorded the persistent occurrence of this taxon in four provinces in southern Iraq during 2005-2012, with a rediscovery (which was a large range extension) at one site in northern Iraq (Kurdistan). The Map below shows the occurrence of Iraq's Smooth-coated Otter (shown by the red dots)

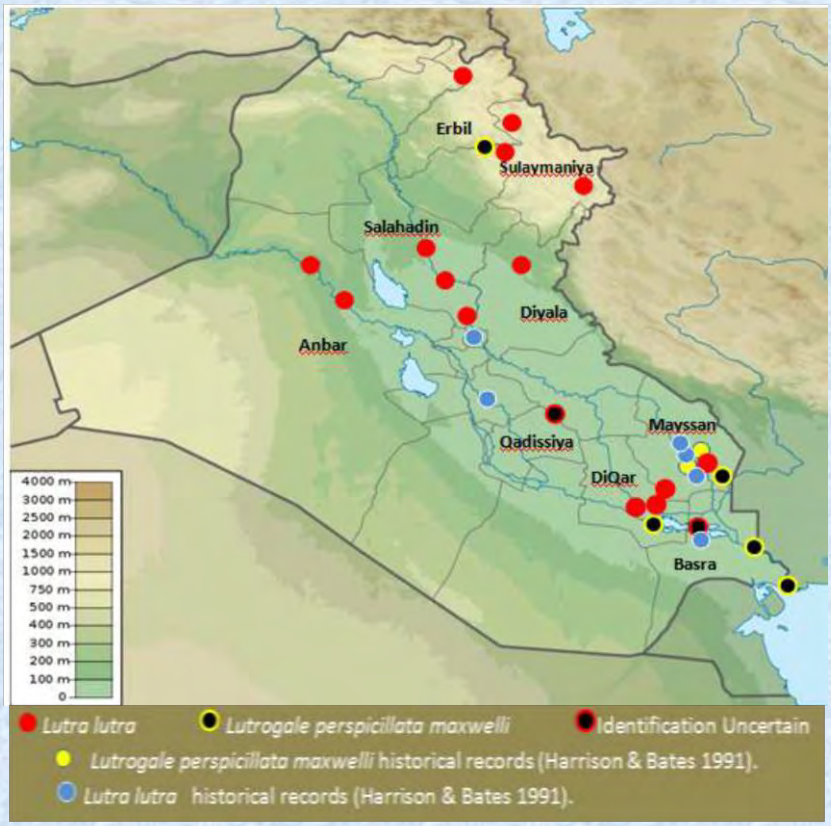

Figure 2-21. Map shows the historical and recent sightings of Lutra lutra and Lutrogale perspicillata maxwelli
http://www.otterspecialistgroup.org/Bulletin/Volume30/AlSheikhly_Nadar_2013.pdf

Obstacles and scientific and technical needs related to the measure taken:

Following the publication of the fifth national biodiversity report and NBSAP, a range of initiatives to develop biodiversity by the Iraqi authority have been advanced. Scientific and technical cooperation between the stakeholders and MoHEnv in several fields has occurred between 2014 and 2018 including threatened species, protected areas, impact of climate change, ecotourism, and desertification.

Obstacles:

1. High security conditions in some governorates (e.g. Mosul, Anbar) cannot be covered by field surveys.
2. More interest and concern needed by decision makers about threatened species in Iraq.

Scientific needs:

1. Data collection (surveys) across many parts of the country and regular monitoring of biodiversity. This is important to address the gaps in the existing database of some taxa, especially flora.
   This type of discrepancy is common amongst different taxa globally, for example all mammals and birds have been assessed multiple times but only a small proportion from some groups have even been assessed once [(1)], Such relative differences are mirrored in data from field surveys and scientific publications.
2. There have been substantial efforts by the Iraqi government since 2009 when Iraq ratified the UN Framework Convention on Climate Change, UNFCCC. Iraq has formed several national committees to tackle climate change. However, the data regarding impact of climate change on threatened species is limited. Such work requires high scientific and academic expertise with high modelling and prediction capability for assessing the impact of climate change on threatened species.
3. Increasing ecotourism activities can have a direct impact on threatened species. In recent years, there was a focus by the Iraqi government to develop national plans of ecotourism in the country's Protected Areas such as the Mesopotamian Marshlands. One of the main obstacles that faced this area is lack of legislation and guidance on best practice.
4. Drought is one of 11 threats to threatened species in Iraq (KBA assessment report, 2017); however, the extent of this threat has not been assessed in the report due to lack of information. Iraq faced a severe drought which had negative consequences on the Iraqi environment. Despite cooperation at the national and regional levels to tackle drought and desertification in Iraq, there remain serious obstacles to tackling this issue due to lack of data (e.g. regarding Land Cover Classification) and limited financial allocations.

Technical needs:

1. Training of field survey methods (for biodiversity and threat recording).
2. Capacity building for individuals and communities for actions to preserve biodiversity.

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(1) (Brooks et al. 2016 https://www.nature.com/articles/sdata20167.pdf).

NBSAP A.3.c: By 2017 identify the desertified areas of Iraq, by comparison with historical data and evaluate the total surface of these lands and select among all the inventoried desertified lands 1000 Km^2 of ecologically valuable shrub land-grassland to be restored. By 2018 draft an action plan for restoration of the selected lands; by 2020 the action plan is on-going.

Measures taken to contribute to the implementation of the national biodiversity strategy and action plan

MoA is considered the main agency responsible for implementing the actions to combat desertification in Iraq. There are two main areas of focus: (i) to stabilize sand dunes; (ii) the development of vegetation cover and forests. Action was originally intended between 2010 - 2016, and 60% of the MoA projects outcomes were achieved, but this was suspended because of the cessation of financial resources caused by a combination of the drop-in oil prices (and associated economic problems) and the budget needed to fight terrorism (e.g. ISIS attack on Mosul).

The total area of arable lands is 51,616,179 donum [(2)] (32.6% of total land), and the cultivated land is 14,024,111donum (27% of the arable land) on 2014 (excluding KRG)

(Source: Ministry of agriculture /agriculture statistics,2014) [(3)]
http://www.zeraa.gov.iq/index.php?name=Pages&op=page&pid=98

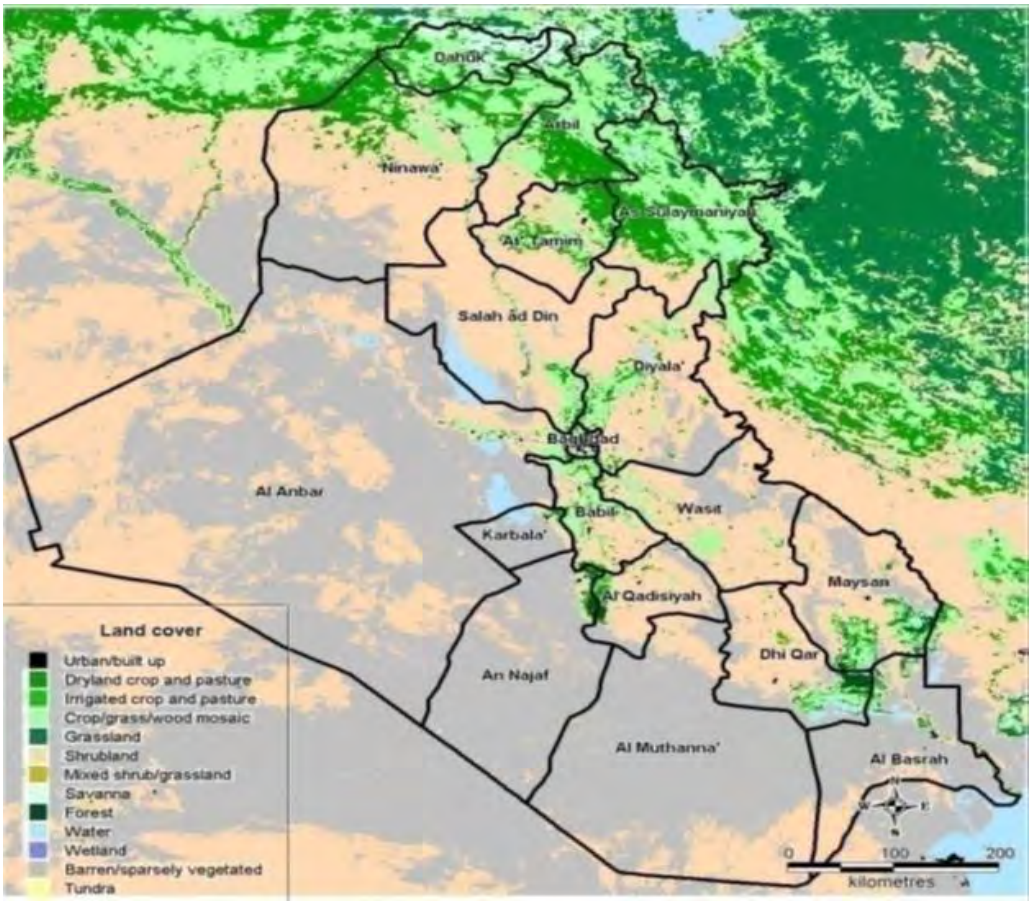

Figure. 2-21 Distribution of the main types of land cover in Iraq

(2) 1 km ^{2}=400 Donums
(3) Note: After 2014, no statistical data available for governorates under conflict

Where it is found that the arid barren lands occupy large areas, especially in the western plateau, with important areas for land covered with brush and shrubs. The land cover, which includes agricultural areas, are small areas located only around the irrigation areas, except for the northern areas. Figure 2-21 shows the different land cover types including water and wetland distribution in Iraq.

Source: National Program of sand and dust storm combat in Iraq (2015-2020)
http://www.moen.gov.iq /6NR/studied and reports

The area of desertified land area in Iraq was identified, except for the Kurdistan region, which is 26,778,563.1 Donums (66,946 Km^2), as shown in the table issued by the Ministry of Agriculture / Directorate of forests and combating desertification.

Land in Iraq faced deterioration, land desertification and degradation specially the movement of sand dunes and a frequent occurrence of dust and sand storms in the middle and south of Iraq. According to the Ministry of Agriculture in 2016, sand dunes constitute four million donum (1000km^2) in the middle and south of Iraq, and around 5.5 million donum (13,7500km^2) in all Iraq (see Table 2-9 below).

Table 2-9 shows the area of degradation land in Iraq, details of the desert land area on governorates level *and the type of the status in donum*.

(Kurdistan region is not included in this Table)

Governorates	**Desertified Land**	**Lands threatened by desertification**	**Area of sand dunes**	**Area of salty and plowed lands**
Muthanna	6515160	13796000	1486770	7283000
Najaf	666568	10287900	31597.301	369067
Qadissiya	338226	1300360	59516	102796
Missan	1439960	2423940	91724.398	1162620
Anbar	7467920	45804400	72126	2344330
Babylon	26921.801	317202	2656.24	40510
Baghdad	87973.602	414612	NIL	NIL
Salah al-Din	929360	4982240	1235420	585488
Basrah	3348780	2920310	10781.8	626952
Thi-Qar	1459660	1759030	68566.398	539384
Diyala	657476	1737990	49147.602	103204
Wassit	1106680	2093360	25764.699	269713
Kerbala	428932	1094350	29768.199	89255.203
Karkuk	11725.7	661980	NIL	NIL
Mousl	2293220	4137640	1078000	NIL
Total	**26,778,563.1**	**93,731,314**	**5,494,200**	**13,516,319.2**
% from total land area	**15.3 %**	**53.5 %**	**3%**	**8%**
Total land area without vegetation	**139,520,396.3**			
% of land area without vegetation in Iraq	**79.8%**			

There is an increase of 70% in the total area of net dynamic change of sand dune in Iraq within 10 years after 2006 (see Figure 2-22).

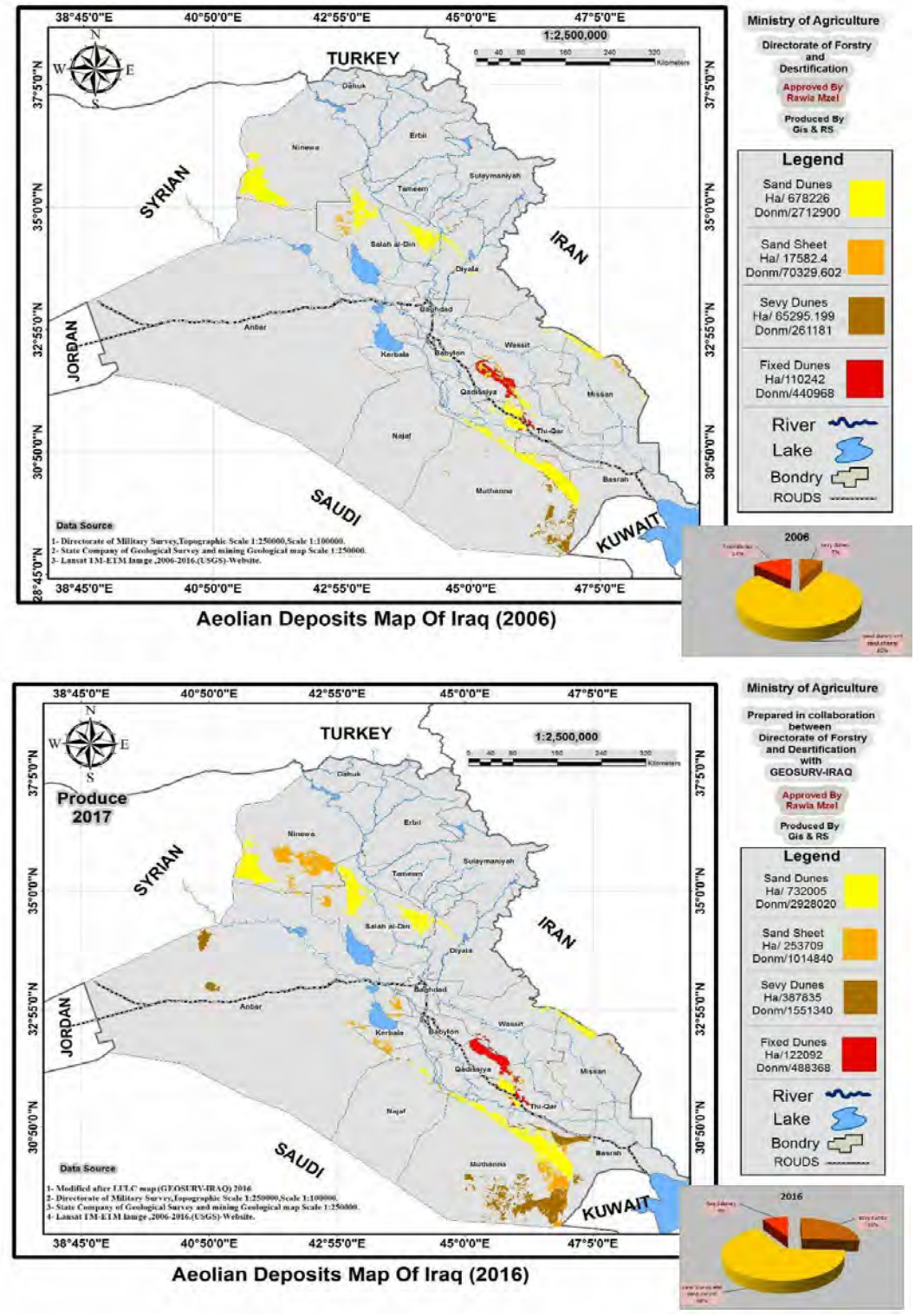

Fig 2-22 Change in sand dune and sand sheet areas between 2006-2016.
(Source: Ministry of agriculture/ Directorate of forests and combating desertification)

Desertification area in KRG was considered a small area compared to the rest of the other areas of Iraq as most of the territory of Kurdistan is located in rain-secured areas.
The desertification exists in the Kurdistan region, especially in the areas that fall within the regions that are non-rain-secure and semi-secure areas. MoAWR in KRG has estimated that more than 7000 donum of agricultural, forests and pastoral areas in Erbil are affected by desertification and drought. Karimyan is the area most affected by desertification in KRG, about 1,550,000 donum is considered rocky lands (not suitable for agriculture), other pastoral areas in KRG have also been affected by drought with resultant poor plant cover.
For the other part of the action MoHEnv in coordination with MoA was awarded a project entitled "Sustainable Land Management for Sustainable Livelihoods in the Degraded Areas of Iraq" funded by the Global Environment Facility (GEF). The aim of the GEF project is to sustainably manage globally significant ecosystems, and to fight against land degradation and conserve marshlands ecosystems in Iraq for improved livelihoods and ecosystems resilience and the resultant services that can flow from these areas. The FAO is the implementing agency, the action taken for this target was covered by Component 2 / Outcome 2.2 of the Project (refer to PIF of the Project). As per the PIF, the submission date of the project was 17 March 2017 with a project duration of 48 months. However, the project was delayed for technical issues; the implementation will begin in October 2019.
The following project sites and the implementation measures, have been preliminarily identified to meet the objectives described above:

- Rehabilitation of Badia Al-Shawya area in the district of Al-Salman in Al-Muthanna Governorate (area of 3000 hectares).
- Sustainability and livelihood improvement, in Al-Majd area of Al-Muthanna governorate (area of 3000 hectares).
- Sustainability and Improvement of Livelihoods, in the villages of Al-Tar area, adjacent to Hor Al-Hamar Al-Gharbi area in Dhi Qar Governorate (area of 4000 hectares).

Contribution to the Aichi Biodiversity Targets or National Targets

NBT 9: By the end of 2020, about 1,000 km^2 of desertified shrub land and grassland have been restored.

Effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been partially effective.

The reason of selection the measure's effectiveness

The classification of desertified land in Iraq according to MoA was identified but comparison with historical data and rate of desertification to the total area are not available.

The Project funded by GEF aims to help achieve sustainable management of degraded lands. The project aims to reclaim 1000 km^2 of land (from desertification), the successful grant application is taken as partial success for this action.

Obstacles and scientific and technical needs related to the measure taken:

Obstacles:

1. Difficulties with water shortage due to upstream dams both within and outside of Iraq may be an obstacle to implement some of the project actions efficiently.
2. The security situation and the exposure to military operations and their aftermath, especially in the governorates that have been exposed to terrorist acts, makes it difficult to implement reclamation actions, so implementation is restricted to the southern provinces.
3. Coordination between authorities on national and local levels to secure the water needs is required for the implementation of reclamation projects.

Scientific needs:

1. Need for the use of modern technologies to control and update natural vegetation with high-resolution images and associated capacity building in this technological field.
2. Training on estimation of the productive land degradation cost as well as costs from biodiversity degradation.
3. Strengthening national capacities in meteorology, and early warning systems for the state / update of land degradation.

Technical needs:

1. Establishment of database on all kind of land areas, their status, with land degradation assessment.
2. Need for modern technologies to monitor and update natural vegetation, spatial data (high resolution maps) and capacity building in this technological field.
3. Develop an action plan for land restoration in coordination with key stakeholders, identifying the role of each, the technical, financial, and human resources requirements. This would require urgent international support from the specialized agencies.

Financial needs:

1. Although there are projects for the reclamation of desertified lands, their sustainability may face some obstacles that deviate from achieving the goal by 2020, for example, projects established by the MoA/ Directorate of Forestry and Combating Desertification, which have been delayed due to lack of financial allocations.
2. Financial support to cover the above needs.
3. Support of research teams to complete field surveys and complete/update information on different ecosystems.

NBSAP A.4.a: By 2016, using the existing available data on habitats under high level of threats (e.g. over hunting and grazing, pollution, war residuals), or with high number of threatened species, develop a GIS map on the most sensitive habitats of Iraq.

Measures taken to contribute to the implementation of the action

In addition to the Protected Areas already designated or proposed for designation shown on the World Protected Area database (https://www.protectedplanet.net/) there was a major survey of Key Biodiversity Areas (KBA) in Iraq (published in 2017). The study was carried out by the MoHEnv in cooperation with an NI to identify, document and propose protection of a range of ecologically important sites in Iraq. The surveys covered a wide range of information on biodiversity and site characteristics including threats to each site.

Operational Steps:
1.A network of 82 sites has been established based on various international standards (Important Bird Area IBA and Important Plant Area IPA) covering 6.5% of Iraq's area of 28,388 km^2 for animal and plant species surveys. These sites are nominated as protected areas that need to be officially protected by national legislation.

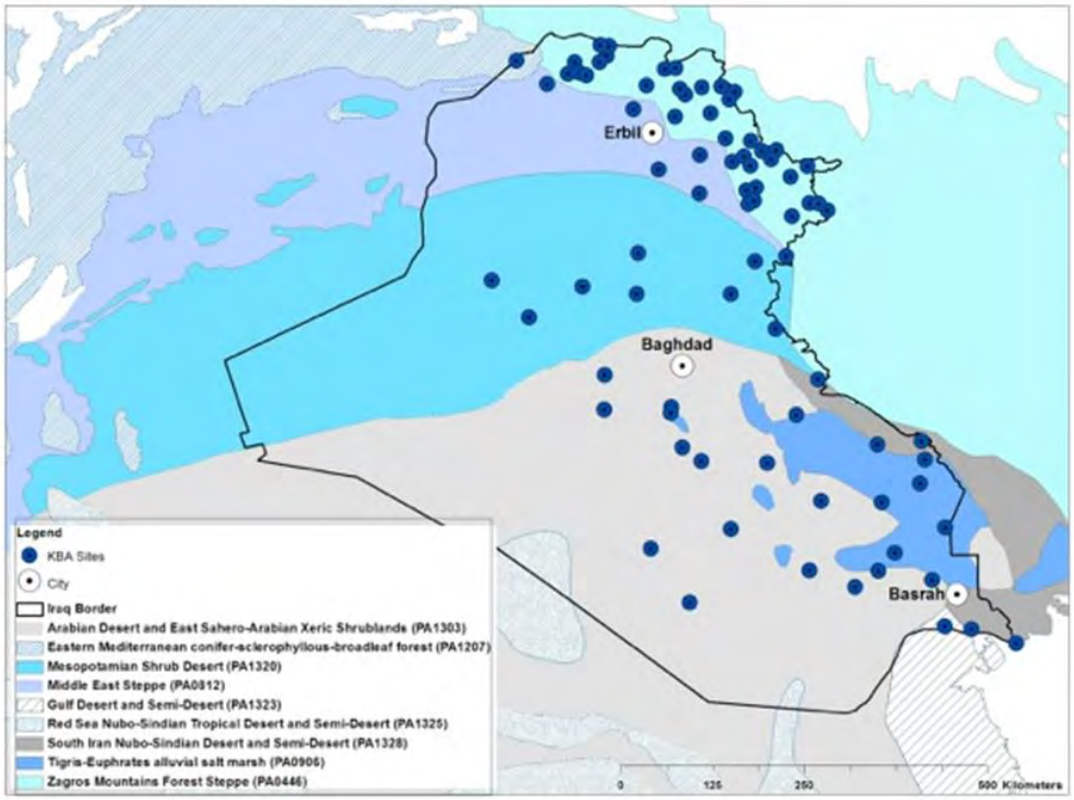

Figure No.2-23 The 82 Iraq KBA Sites shown with regional Terrestrial Ecoregions as defined by WWF.

Under the Convention on Biological Diversity (CBD), it is stated that all signatory countries should reach the goal of protecting a minimum of 17% of the major habitats within each country. In the World Protected Area database only 1.53% of the land area in Iraq is either formally protected or proposed for protection (database accessed on 24/04/2019). The area represented by the Iraq KBAs comprises 6.5% of the total area of the country and covers a variety of habitat types. Thus the 82 sites identified here represent an important step forward in identifying priority conservation areas for Iraq.

2.Thirty-nine of the 82 sites were selected based on the presence of important conserved species, of which 21 sites correspond to non-invasive criteria for the presence of a restricted species.

3.The selection of sites specifically important for birds related to 82% of the sites which were identified by the presence of 9 species of birds threatened with extinction (1 critically endangered, 4 threatened, and 4 classifieds as vulnerable to extinction) by the IUCN Red List of Threatened Species. In addition, 42% of the areas important for birds were characterized by clusters of species with a restricted range. Twenty-six of these sites (39%) were suitable for large-scale water and land birds.

4. Areas defined according to the criteria of important areas and habitats for plants, included 55% of areas with endemic, semi-endemic and rare (nationally) species. In total Iraq has 180 important plant species (58 endemic, 66 semi-endemic, 56 rare) identified in the KBA document based on IPA criteria for plant species and habitats.
There are many threats that pose a danger to species or habitats in Iraq. These threats are discussed extensively in the individual site assessments of the KBA report (2017). Sites in Iraq often face several threats (see Table 2-10 below) of varying scope and severity. For each threat, a separate map was drafted with information presented spatially about the level of threat.
Figure 2-25 shows an example of the distribution of one threat (from agriculture expansion threat) on the 82 sites surveyed as part of the KBA project and reported in 2017.

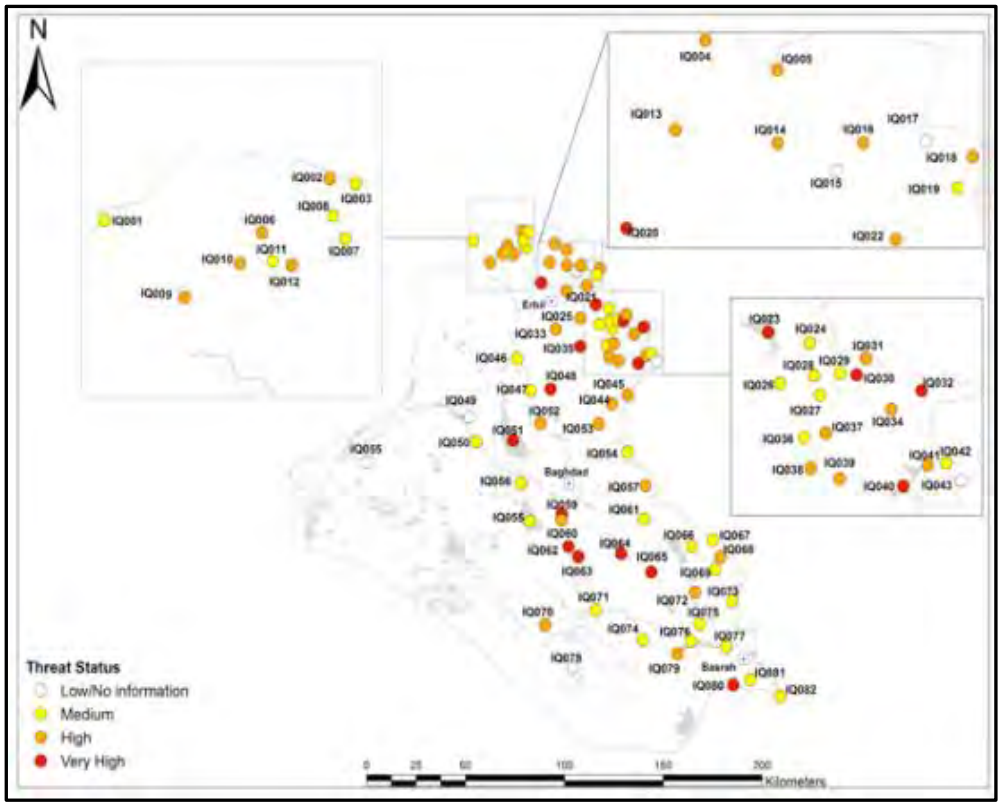

Figure 2-24 Agricultural expansion and intensification (farming and grazing regimes, aquaculture, forestry practices) threats in Iraq area (KBA report).

Landscapes can change enormously over time. For example, infrastructure such as roads and canals are built and then left to decay; wetlands and lakes may be drained; and agricultural or urban landscapes can expand into new areas. For Iraq information on the location of roads, wetlands and other major landscape features may be missing or inaccurate. The KBA project maps aimed to provide an overall impression of a site and its surrounding area, provide landscape condition and show the preliminary boundary of a specific site that could be used as a basis for later formal protected area designation. For field trips and scientific purposes, it is strongly recommended that more detailed or up-to-date maps are drafted. The maps were produced utilizing Landsat ETM+ satellite images Band 8(Panchromatic band at 15m spatial resolution) from 2002 (http://landsat.usgs.gov/band_designations_landsat_satellites.php) overlays with a shaded relief produced from the Shuttle Radar Topography Mission SRTM (Digital Elevation Data at 90m spatial resolution) (http://srtm.usgs.gov/index.php). Additional features such as political boundaries, roads, embankments, water-bodies, wetlands, salt marshes, as well as rivers and other waterways were added to the maps where they were available and may not be consistent across the entire country. To maintain consistent map layout, each map depicts only some of the most important settlements, where no settlement is situated near a site, other features were included when possible to help orient the reader. These maps are available to combine with other data sets to provide a GIS map of Iraq with a wide scope of information across different environmental variables.

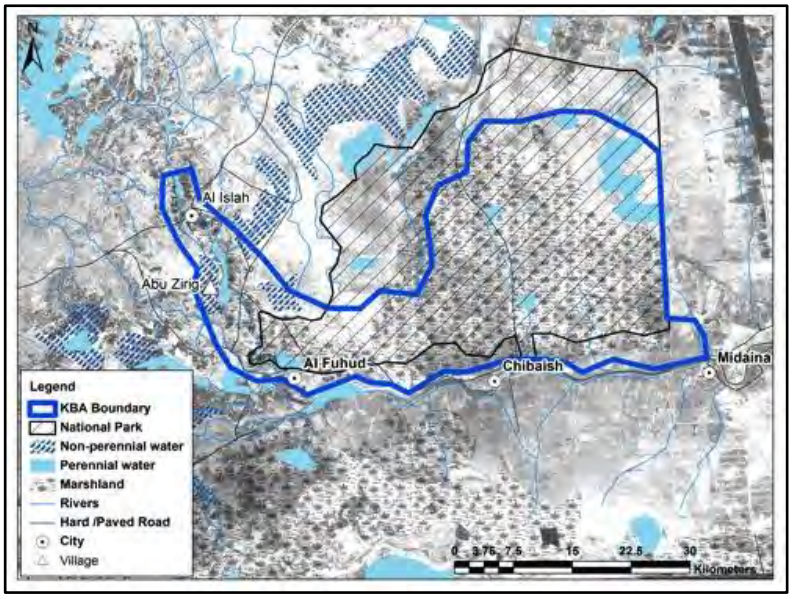

Figure 2-25 example of the preliminary boundary of one of the specific sites from the 82 produced by the KBA survey (published in KBA report in 2017).

Contribution to the Aichi Biodiversity Targets or National Targets

NBT 14: By the end of 2016 a study and GIS maps of the most sensitive habitats (i.e. under high level of threats and containing high numbers of globally threatened species) have been developed

Effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been effective.

The reason of selection the measure's effectiveness

The measures taken towards achieving theis action were effective because of the implementation of the program by preparing maps for sensitive habitats within the specified period of time using data obtained from relevant data sources and surveys

Relevant websites, web links and files

- *KBA*

https://www.amazon.com/Key-Biodiversity-Areas-Iraq-Nature/dp/0988651467

Other relevant information,

Below is an example of the data collected for one species (Marbled Duck) by the KBA surveys (2017). This is provided to illustrate the depth and quality of data recorded.

Study on the status of a map showing the presence of one of the vulnerable birds, Marbled Duck

This species is found in the marshes in central and southern Iraq, where this bird was recorded at 22 sites (67%) out of a total of 33 KBA wetland sites but seven of these sites (21%) did not qualify under IBA Criteria (shown by the small blue squares in the Map in fig 2-26). six held 1% or more of the biogeographical population of Marbled Duck (shown by the largest blue squares in the map). These six sites include North Ibn Najm (IQ062), Dalmaj Marsh (IQ064), Hawizeh Marsh (IQ073), Central Marshes (IQ075), West and East Hammar (IQ076 & IQ077).
It is possible that the remaining qualifying sites also support large populations of Marbled Duck at different times of the year, thus a protected area system that protects a network of all of these qualifying sites would best ensure the conservation of this species.

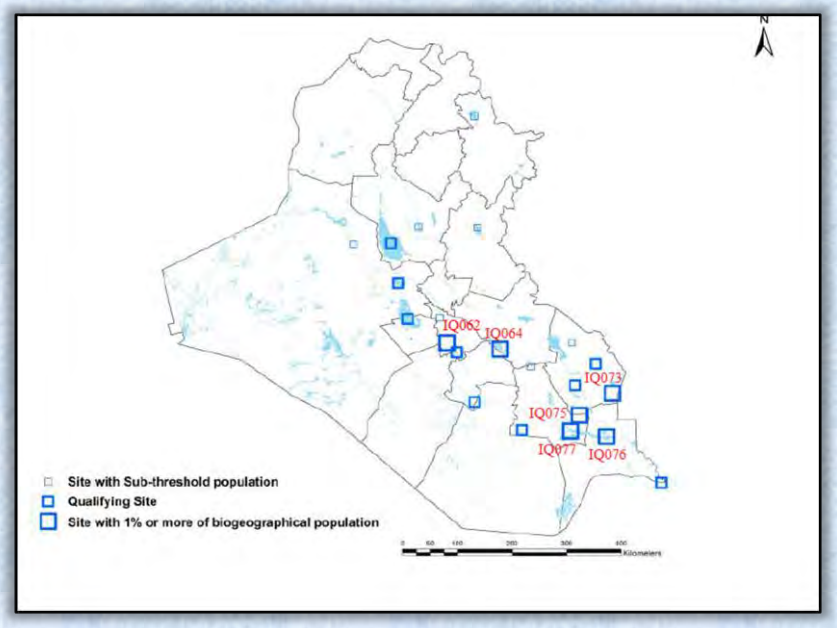

Figure. 2-26 Distribution of Marbled Duck Marmaronetta angustirostris across Iraq from the KBA report in 2017.
KBA https://www.amazon.com/Key-Biodiversity-Areas-Iraq-Nature/dp/0988651467

Obstacles and scientific and technical needs related to the measure taken:

Obstacles:

1. Survey team had to work in a challenging security conditions in some areas.

2. Coordination and information exchange between stakeholders are major obstacles.
3. Limited availability of technical expertise to undertake spatial mapping.

Scientific needs:
Surveys and data collection and regular monitoring on habitat loss and threats.

Technical needs:
1. Technical support on the updating of GIS maps.
2. Capacity building on the use of remote sensing techniques.

Financial needs:
Financial resources to cover the above Needs.

NBSAP A.4.b: By 2016 design a gap-filling program based on the available data for building the GIS database for the identification, extent, condition and protection status of the natural, semi-natural and human modified habitats

Measures taken to contribute to the implementation of the action

In the KBA report database 82 sites were assessed according to available scientific information, prepared and managed as far as possible using standardized methodology (KBA report 2017). Each site account was established and consists of the site name and basic geographical information; a general site description; a table showing the qualifying species/habitats and their status under each criterion; a description of the important fauna, flora and habitat findings; a threat assessment graph; an overview of conservation issues related to the site, and recommendations, for further actions. These sections also include GIS maps, photographs, and other elements of the assessments.

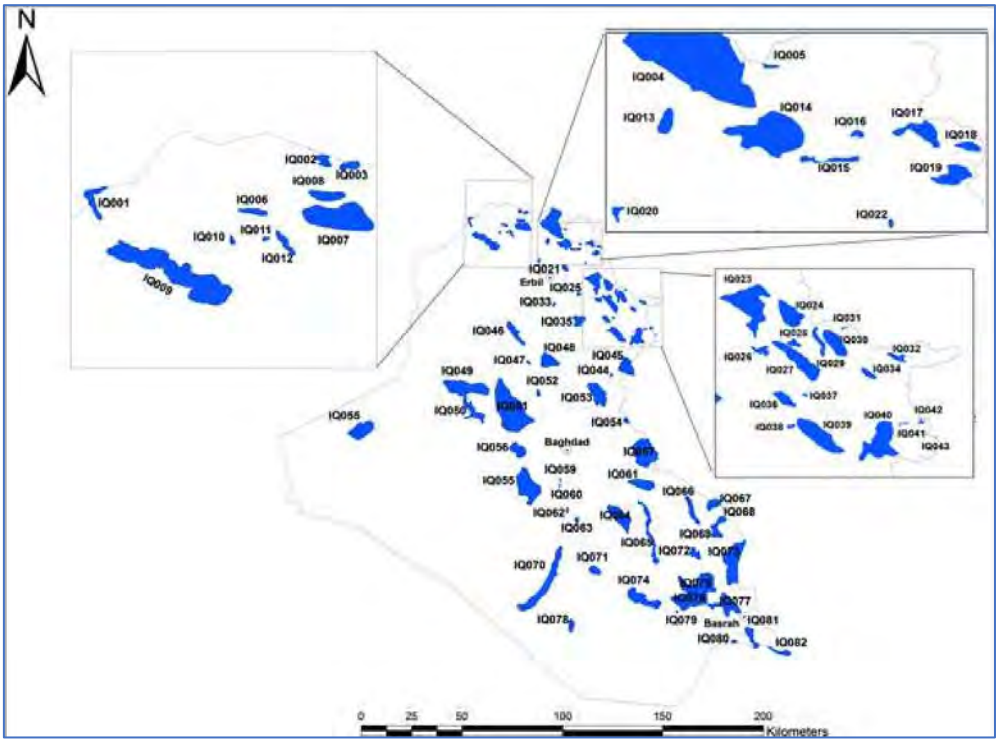

Figure 2-27 Spatial distribution of KBA areas in Iraq

All 82 sites are shown in Figure 2 – 27 along with individual codes used in the KBA document.

Below is an example of one set of the programme database (KBA report 2017, chapter 7, KBA assessment).

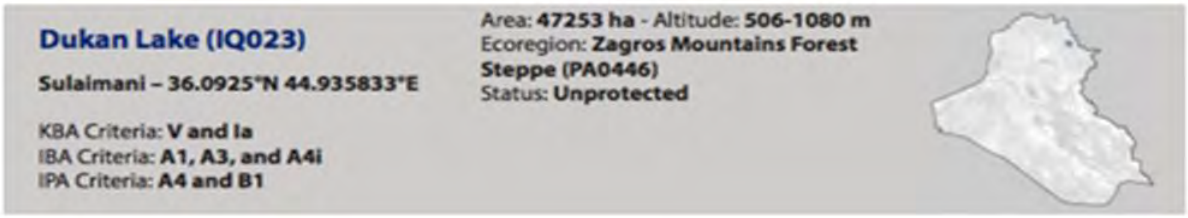

Figure 2-28 A header of one set of the KBA site account

Table 2-10 Threat type and their symbols used in the KBA document of 2017

Threat type	Symbol
1. Agricultural expansion and intensification (farming and grazing regimes, aquaculture, forestry practices)	
2. Residential and commercial development	
3. Energy Production and mining (gravel mining, oil development, electrical towers, etc.)	
4. Transportation & service corridors (development of roads and shipping corridors)	
5. Over-exploitation, persecution and control (logging, hunting, over-fishing, etc.)	
6. Human intrusions and disturbance - Effects related to non-consumption of biological resources – recreational activities, war, military exercises work and other activities	
7. Natural systems modification (dams and changes in water, filling in wetlands, drainage, dredging, canalizations	
8. Invasive or other problematic species	Not assessed due to lack of information
9. Pollution (municipal and industrial waste and garbage, noise, air, light, & thermal pollution).	
10. Geological events (threats from catastrophic geological events)	Not assessed due to lack of information
11. Climate change, severe weather, drought, floods	Not assessed due to lack of information

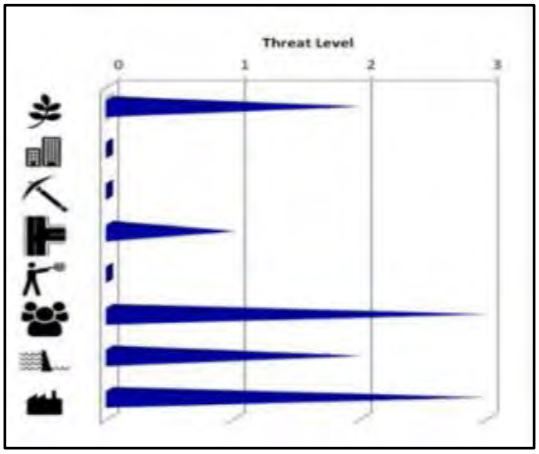

Figure 2-29 Threats level in the 'Dukan lake' site.

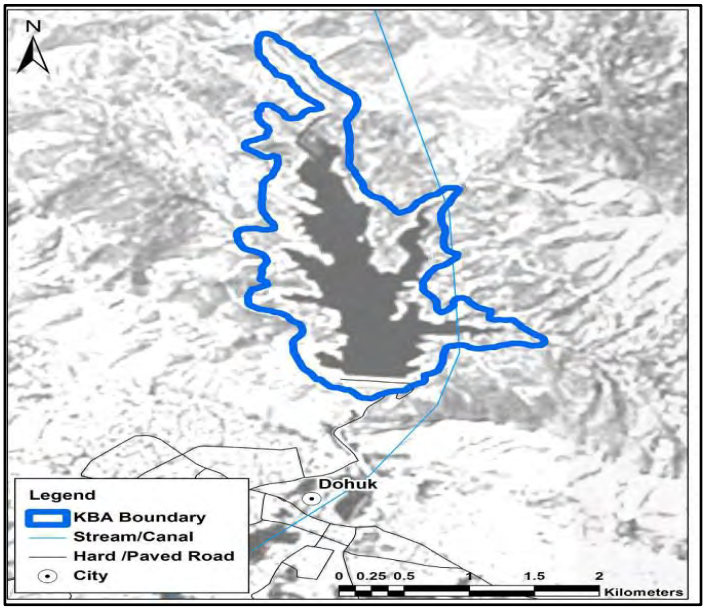

Figure 2-30 A GIS map of one site selected (Dukan) of the 82 from the KBA document 2017.

Contribution to the Aichi Biodiversity Targets or National Targets

NBT 5: By the end of 2020, produce a GIS database of the extent, condition (i.e. healthy or degraded) and protection status of the natural (not altered by human intervention), semi-natural and human modified habitats of Iraq has been developed.

Effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been partially effective

The reason of selection the measure's effectiveness

The publishing of the KBA report in 2017 was a first step toward the fulfilment of this action. The KBA report fills information gaps for species/natural habitats status and conservation in Iraq by identifying sites that are not currently designated as protected areas. However, the KBA report covered only 82 sites distributed throughout Iraq, so there are many areas which have not been assessed yet.

Relevant websites, web links and files

- *KBA https://www.amazon.com/Key-Biodiversity-Areas-Iraq-Nature/dp/0988651467*

Obstacles and scientific and technical needs related to the measure taken:

Same as NBSAP A.4.a

NBSP A.4.c: By 2016 design and carry out a Field work scheme in order to detect loss and degradation of main natural, semi-natural and human modified habitats of Iraq and their reasons, by making a comparison with the natural (old) status – based on the references and literatures and using indicators such as, species, habitat size, ecosystem services provided, etc. By 2020 summarize and store in a complete database the obtained information.

Measures taken to contribute to the implementation of the action

All information from the KBA report in 2017 (joint cooperation between MoHEnv and NI) was included in a database. Threats in the KBA project were assessed using the Pressure-State-Response (PSR) Model. The PSR Model relies on three major indicators: pressure, state and response. Pressure indicators identify and track the major threats to important species and habitats. Examples include rates of agricultural expansion, over-exploitation and pollution. State indicators refer to the condition of the site, with respect to its important species and habitats. State indicators might be population counts of the birds or mammals that are present at the site. They might also be measures of the extent and quality of the habitat required by these species. Response indicators identify and track conservation actions: for example, changes in conservation designation, implementation of conservation projects and establishment of Local Conservation Groups.

In addition to collecting data on habitats and species there was explicit data gathering of loss, deterioration and threats through periodic field surveys on a quarterly basis, by the MoHEnv using a special format (mentioned in NBSAP A.4.g) in order to update the information about the state of habitat (mentioned in the KBA report 2017). Example of this information on threats is presented in Fig 2-25 above (NBSAP A.4.a). The threats to these sites will be combined into a prioritization list to guide action of designation of sites.

Contribution to the Aichi Biodiversity Targets or National Target

NBT 6: By the end of 2020, the reasons for loss and degradation (i.e. the species that used to be present in that habitat are not there anymore, and the services that the people expected or used are reduced or absent) of each of the natural (not altered by human intervention), semi-natural and human modified habitats of Iraq have been identified to inform conservation actions.

Effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been effective

The reason of selection the measure's effectiveness

Threats for all 82 sites categorized as Key Biodiversity Areas have been assessed during surveys and the data has been published in a report in 2017.
MoHEnv is following up the status of the sites by collecting information using the Biodiversity survey form (see NBSAP A.4.g). The MoHEnv distributed the form to environmental directorates in all governorates in April 2018 to collect data from all 82 Key Biodiversity Area sites. Data was collected on a quarterly basis (every 3 months). Three governorates (Kirkuk, Missan, Basra) have so far started and sent two survey reports (as on 04/11/2018) but some regional staff require training to complete the forms (and budget is lacking).

Relevant websites, web links and files

KBA
https://www.amazon.com/Key-Biodiversity-Areas-Iraq-Nature/dp/0988651467

Other relevant information,

Case Study

Assessment of threats in Al Haweeza Marsh

In a study conducted by the MoHEnv in August 2018 the risks and threats to natural habitats were assessed for Hor Al Haweezah. The assessment found that the threat of fire and drought was the most severe of the 13 threats adopted by the World Heritage convention. The increase in the value of these threats (by comparing them with the results of the past year) found that drought recorded the highest threat value (8 out of 9) followed by fires (7 out of 9) due to the severe water shortage and high temperatures in the summer. The marsh consists of shallow water levels that can be rapidly lost, and therefore the disappearance of water can have rapid impacts on water birds, animals, amphibians, plants and fish (e.g. bunni fish Mesopotamichthys *(Barbus) sharpeyi*, smooth coated otter *Lutrogale perspicillata* and the smooth-shelled turtle *Rafetus euphraticus*).

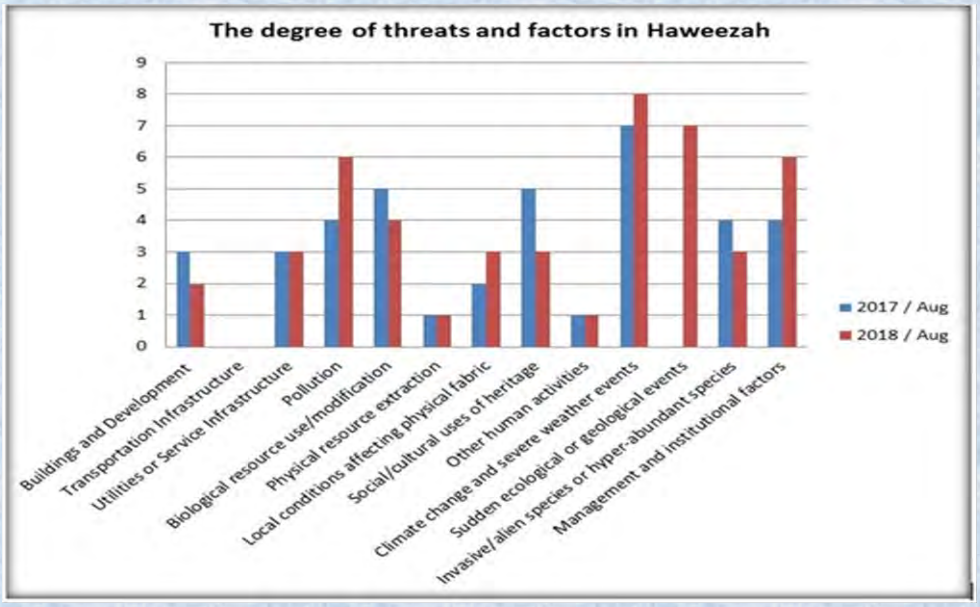

Figure 2-31 shows the threats and factors affecting the natural component of Haweezah marsh in 2018 and comparing them with the AB-2017 assessment.

www.moen.org/6NR/reports and studies

Assessment of Threats and Factors Affecting the Natural Component in al-Haweezah Marsh / Ministry of Health and Environment / AP-2018.pdf

Obstacles and scientific and technical needs related to the measure taken:

Same as NBSAP A.4.a

NBSAP A.4.d: By 2016 perform an inventory of the main forested areas of Iraq and their type, by 2018 identify and evaluate by comparison with historical data, forest loss and major stresses that caused the loss and still exist.

Measures taken to contribute to the implementation of the action

An inventory and identification of areas and types of forests (both natural and artificial) was carried out in 2018 across each governorate in Iraq by MoA/Forests and desertification combat directorate.

The natural forests are distributed in Kirkuk and KRG, while the artificial forests are distributed in all Iraqi governorates except Al Muthanna and Thi-Qar and Basra as mentioned in the Table 2-10 below.

Table 2-10 Area of forests (natural and artificial) in Donums per each governorate in Iraq (including KRG) on 2018 in donum.

Governorates	Forests			
	Artificial forests		Natural forests	Total Forests
	Area controlled by Governorates	Area controlled by MoA/Forests and desertification combat directorate		
Erbil	8,536	-	543,032	551,568
Sulaimaniyah	17,885	-	607,008	624,893
Dohuk	8,068	-	1,040,908	1,048,876
Ninewa	198	35	-	233
Karkuk	-	1,265	-	1,265
Diyala	556	669	136,244	137,244
Anbar	664	-	-	664
Baghdad	-	3,310	-	3,310
Babylon	1,821	-	-	1,821
Karbala	237		-	237
Wassit	100	10,462	-	10,562
Salah al-Din	140	-	-	140
Najaf	658	-	-	658
Qadissiya	820	-	-	820
Muthanna	-	--	-	-
Thi-Qar	-		-	-
Missan	250	--	-	250
Basra	-	-	-	-
Total	**15,716**	**39,933**	**2,327,192**	**2,382,841**

Source: MoA/Directorate of Forests and combating desertification (2018)

The natural forests area in Iraq is 2,327,192 donum while the artificial forests area is 55,649 donum. The forest area in Iraq covered (2,382,841 donum) that constitute 1.4 % of the land area, KRG forests constitute 93% of total forest area in Iraq.
The security situation resulted from (military operations and conflict against ISIS) and the economic conditions in the country hindered collecting data to evaluate the loss of forests during the period (2014-2018).

The current and previous pressures experienced by the forest areas were identified by MoA as follows:

1. Infrastructures and agriculture projects on forests areas.
2. Destructive logging practices and unsustainable fuelwood.

3. Increased fire incidence and intensity.
4. Forests damage due to military operations (in Ninawa and Salahaldin Governorates).
5. Poor forest management and protection associated with lack of financial resources.

Measures should be taken to protect (natural and artificial) forests:

- Activate the current law enforcement about tree exploitation, agriculture areas and stop overgrazing.
- Ensure forests are protected by managing the use of pesticides.
- Raising awareness of farmers and local communities on the benefits of forests to humans (e.g. ecosystem services), the environment (e.g. CO2 reduction), and economy (e.g. ecotourism and job creation).
- Reduce all kinds of pollution on land and air including sand storms.
- Ensure enough water quantities for irrigation of artificial forest land.
- Address climate change and apply mitigation and adaptation solutions.

Contribution to the Aichi Biodiversity Targets or National Targets

NBT 7: By the end of 2016, major pressures on forest ecosystems have been identified and studied.

Effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been partially effective

The reason of selection the measure's effectiveness

- Comparison of previous years during the period 2014-2018 was not available (from direct measurement on the ground) because of the security and economic situation in the country.
- Lack of assessment of forest loss and major stresses that caused the loss by the year 2018 due to lack of financial allocations.

Other relevant information

Forests rehabilitation in Sulaymaniyah governorate

MoAWR in KRG with the support of GIZ and a German company achieved 24 small projects within a period of four months starting from Oct 2016, to rehabilitate the natural and artificial forests in Sulaymaniyah that was vulnerable to fire risk. The projects covered the natural and artificial forest, work completed included repairing and cleaning trees, weed removing and pruning 304,545 trees, building fire preventing stones walls (900-meter-long) of 1m in height to protect the land from external use by shepherds and others, and decrease the risk of eroding the mountain into the forest. In addition, the establishment of nurseries to collect, protect and maintain trees including those received from other governorates. These projects create jobs for local communities.

(Enabling) Project for land cover development

In 10 Governorates (Baghdad, Wassit, Anbar, Diwaniya, Thi Qar, Salah Al Din, Ninawa, Maysan, Babil and Basra), MoA started a planting campaign in April 2019 in a project for two years funded by Iraqi Bank with one billion IQ(840 million US$) in an initiative called "Enabling" aims to plant 200,000 saplings of different species

(e.g. Eucalyptus, Casuarina, Cupressus, Dodonaea, Nerium oleander, Olive oil). This initiative will be accompanied by training courses, meetings within agriculture departments in the governorates targeted at farmers and the agriculture employees.

Case study (article)

Fires and armed conflict take toll on Kurdish flora, fauna

Fazel Hawramy July 5, 2018

SULAIMANIYAH, Kurdistan Region of Iraq — Hawraman Sajadi nearly lost his life a year ago trying to help fire-fighters during a forest fire in the Bafri Miri Mountains, in Iraq's Halabja region, bordering Iran.

When fire broke out on that hot summer day last July, Sajadi and two friends had set out on foot to take food and water to the two dozen firefighters battling the fire. They were unfamiliar with the terrain. As they walked along, one of them spotted a sand-coloured anti-personnel mine. Terrified, the group then noticed several more mines around them.

"We could see the fire raging in the distance, but we were trapped in a minefield," Sajadi said. "We walked carefully along the dirt road, trying to avoid the land mines and hoped for the best." There are 3,440 minefields across the Iraqi Kurdistan region, remnants of the Iran-Iraq War (1980-1988), according to the Iraqi Kurdistan Mine Action Agency.

The group survived and even managed to deliver the food and water to the firefighters. By the time the fire was extinguished, hundreds if not thousands of trees had been destroyed, Sajadi estimated. "The [forestation and environment] police have no equipment for the mountains and use shrubs or branches of trees to put out the fires," Sajadi, an environmentalist and wildlife activist in Halabja, told Al-Monitor. The firefighters lack personal gear, transport vehicles to get to the top of mountains, helicopters, hoses and adequate manpower.

"It is not only trees that burn," said Sajadi, who has devoted the last 10 years of his life to trying to protect forests and wildlife. "A destroyed forest means snakes, grasshoppers, wild beehives, turtles and birds, including partridges, have been burned alive." The World Wildlife Fund reported in 2014 that in the last 40 years", the world has lost half of its wildlife.

Wildfires are common in Iraqi Kurdistan, a scenic region where many Iraqis seek refuge from the summer heat. Several fires broke out across the Kurdistan mountains in June, burning acres of land and forests and wreaking havoc on animals. The region has considerable rainfall in spring, but the mountains, covered with lush vegetation and trees, are susceptible to accidental or deliberately set fires in the hot and dusty summers.

Forest fires have become a global issue. The Guardian cited data from Global Forest Watch asserting that the world lost more than one football pitch of forest every second in 2017. The destruction, some of it caused by wildfires, "poses a grave threat to tackling both climate change and the massive global decline in wildlife," the report said.

https://www.al-monitor.com/pulse/originals/2018/07/kurdish-forests-under-threat-of-wildfires.html

Obstacles and scientific and technical needs related to the measure taken:

Obstacles:

1. Lack of environmental awareness about the importance of forest biological diversity among large segments of society.
2. Database on forests areas, forest loss and threats are not easily evaluated because of the restrictions on visiting some parts of the country due to the security conditions.

Scientific needs:

1. Research on the impact of climate change on forest degradation and loss of biological diversity, environmental, economic and social impacts of forest loss.
2. Research needed on land use management and how this relates to carbon storage and climate change.

Technical needs:

1. Building technical and institutional capacities in forest conservation, protection and development.

2. Develop an integrated country-level program for the development of forests.
3. Conduct comparative studies and update available statistical data to diagnose forest loss.
4. Creating an action plan to address existing pressures and threats to forest areas.
5. Comparative studies of existing data with old statistics available data to diagnose forest loss.

Financial needs:

1. Financial support to implement inventory and capacity building in analysis and determine gaps.
2. Provide support for forest status assessment based on modern systems such as GIS.

NBSAP A.4.e: By 2017 a national monitoring programme is established for identification of the types of pollutants, the sources and diffusion paths.

Measures taken to contribute to the implementation of the action

The MoHEnv works in cooperation with the relevant authorities to protect and improve the environment, which suffers from the effects of pollution through preparation of programs to control pollutants in all governorates of Iraq. This includes programs to monitor activities that cause pollution, which in turn impact on natural ecosystems.

Water quality monitoring program for water resources

Based on the Environment Protection and Improvement Law No.27 of 2009, and based on the guidelines of the water resources conservation No. 25 of 1967 and the guidelines of conservation of water resources No. 2 of 2001, the concerned authorities in the MoHEnv are monitoring the quality of water resources based on the monitoring program for the two rivers (Tigris and Euphrates) and their tributaries from their entrance in the Iraqi boarders downstream to the Gulf. Samples (collected twice per month) are taken for each station to be analyzed, and concentrations of the following are measured: PH, Total Hardness, NO3, PO4, Total dissolved Salt, CL, SO4, Na. etc. The levels recorded are benchmarked against national standards that allow for the investigation into the causes of pollution and propose appropriate mitigation solutions. MoWR also records measurements of some water specifications through several hydrological stations which work automatically by connecting with satellite systems.

Fig. 2-33. Distribution of 102 water monitoring stations in Iraq

Iraqi water suffers from low quality due to several problems mentioned earlier (see Sec I /NBT 10), such as high salinity concentrations and total dissolved solid (TDS) levels caused by upstream sources in Turkey and Syria.

In the study of salinity in Shatt al-Arab and the possible treatments which can be achieved by the Water Resources Department in MoHEnv, the salinity was recorded at high levels (i.e. substantial declines in water quantity) in the Tigris and Euphrates rivers because of a neighboring country's policy of building dams and diversion of the transboundary Karun river route into Iranian territory. This change in the Shatt al-Arab River has impacted negatively on the agricultural land and the environment, especially in many districts of Basra governorate.

Figure 2-34 shows the total dissolved solids (TDS) increase closer to the Gulf and which has increased from 2011 to 2018 in the SH4 station (30366mg/l to 51860) with an increasing rate of 40%.

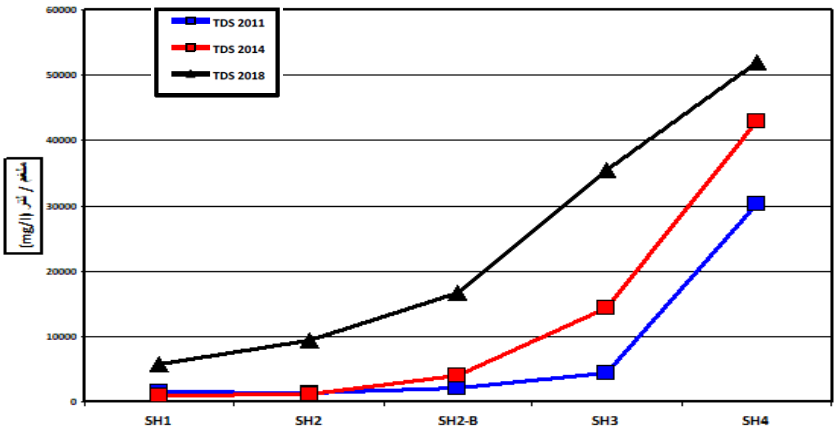

Fig 2-34. Total dissolved solids concentration in Shatt Al Arab (years 2011-2014-2018) Recorded from five different stations (stations are presented in order of distance to the Gulf with SH1 being furthest from the Gulf)

Other research on Shatt al-Arab water salinity, "*Environmental Impacts of Salt Tide In Shatt Al-Arab-Basra/Iraq" (www.researchgate.net/publication/292152354_Environmental_Impacts_of_Salt_Tide_in_Shatt_Al-Arab-Basra Iraq)* confirmed that the change in hydrological characteristics of the Shatt al-Arab has exacerbated the problem of tidal salt to the upper river in the province of Basra and increasing concentrations of total salts TDS. This pattern negatively affected biodiversity in the region by increasing the abundance of marine organisms in the internal waters of the Shatt al-Arab.

Salinization is a common problem for agriculture in dryland environments and it has greatly affected land productivity and even caused cropland abandonment in Central and Southern Iraq (*Wu et al. 2014*). Salinity is one of the most serious degradation processes in central and southern Iraq. It is reported that approximately 60% of the cultivated land has been seriously affected by salinity, and 20–30% has been abandoned in the past 4000 years (*Buringh, 1960; FAO, 2011*) due to irrational land management (e.g. over irrigation and poor drainage) and other natural factors (e.g., flooding, drought, and impermeability of the underlying formation). More than 70 % of the irrigated agriculture lands in the central and southern Iraq have been abandoned in recent years and caused yield declines between 30 to 60 % as a result, mainly of salt accumulation by the salinization process. FAO (1980) indicated that soil salinity increased by about 2-5 dSm^{-1}[6] every year in most of the sedimentary plain. The total area affected by salinity is more than 3.75 million hectares annually. Salinity is a dynamic phenomenon can be changed with time. Figure 2-35 shows the dramatic change of soil salinity with the Mesopotamia plain between 2000 and 2010.

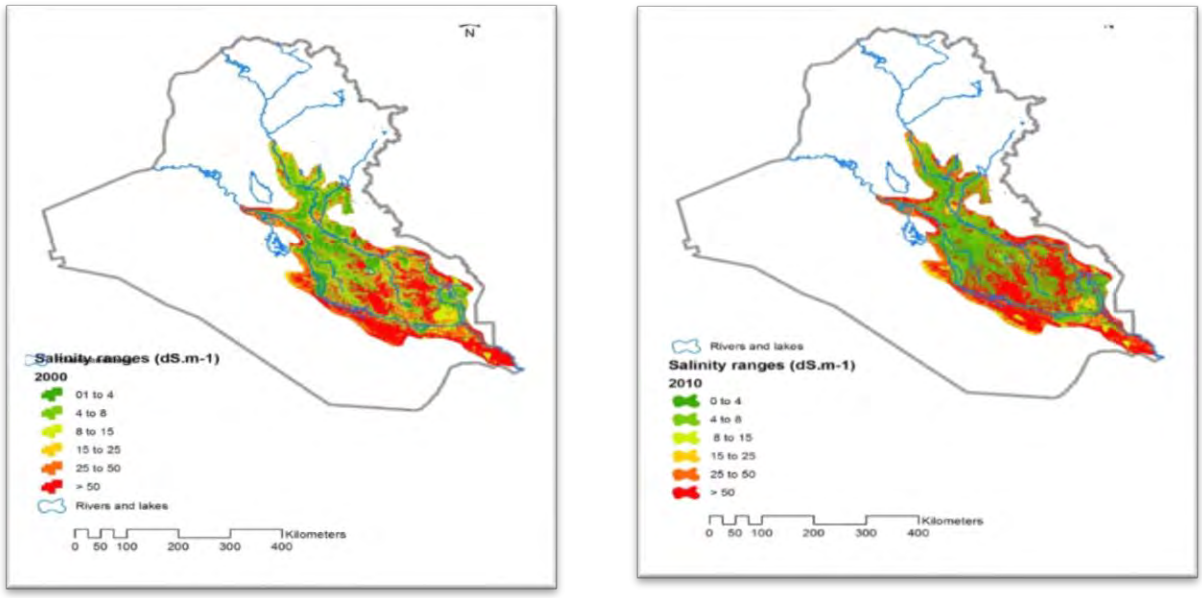

Figure 2-35 Spatial distribution of salinity levels across the Mesopotamia plain 2000 and 2010.

Excess nitrogen and phosphorus are a major cause of loss of biodiversity and degradation of ecosystem functioning, especially in wetland, coastal and dryland areas. Excessive nutrients from sewage and agricultural runoff (e.g. from nitrogen-based fertilizers, animal manure) can also cause dead zones, with severe losses of biodiversity and impairment of ecosystem services. Phosphates are present in fertilizers and can enter the water from agricultural runoff, industrial waste, detergents and sewage discharge.

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[6] dSm^{-1} is the electronic conductivity is a measure of certain salts in the soil, has direct relationship with growth of different crops

Monitoring stations along Iraqi Rivers (Main Rivers /Tigris and Euphrates) and small rivers (Diyala, Al Gharaf, and Shatt Al Arab) indicates that Phosphates concentrations are higher than the permissible level (**0.4mg/l)** in all rivers excluding Al Gharaf, while the Nitrates are within permissible levels. The monitoring stations that recorded the highest levels are those located in south Baghdad especially where Diyala river joins the Tigris river south of Baghdad. Other stations along Shatt Al Arab indicate high concentrations of PO4 in Basra Governorate south of Iraq (see Table 2-11).

Table 2-11 indicate levels of PO4 in mg/l from monitoring stations along five Iraqi rivers (2014-2017).

Year	Concentration limit	Tigris	Euphrates	Diyala	Gharaf	Shat Al Arab
2014	Min	0.08	0.06	0.13	0.1	0.03
	Max	0.34	0.33	1.99*	0.3	0.315
2015	Min	0.13	0.340	0.22	0.13	0.346
	Max	0.44	0.88**	1.96*	0.25	0.486**
2016	Min	0.226	0.36	0.1	0.117	0.268
	Max	0.546*	0.76**	1.98*	0.274	0.486**
2017	Min	0.205	0.197	0.744	0.107	0.51
	Max	0.611**	0.589**	2.359*	0.268	0.686**

**South Baghdad*
***Monitoring locations along Shat Al Arab south of Iraq*

The Marshlands are also covered by the monitoring program with 10 monitoring stations (three or four from each marsh) were taken monthly. Records on the quality of marshland water indicates a general increase of total suspended solids and total hardness due to low water levels in some seasons.

Over usage of pesticide and fertilizers due to agricultural productivity is considered one of the threats leading to the land and water pollution. Table 2-12 below indicates the usage of pesticide and fertilizer in Iraqi governorates from agriculture.

Table 2-12 Agriculture pesticide usage in Iraq (excluding KRG governorates).

Year	Insecticides		Fungicides		Jungle pesticide		total	
	Litre	Kg	Litre	Kg	Litre	kg	Litre	kg
2014	382,400	99,751	2,692	8,786	6,895	134	391,987	108,671
2015	135,297	2,367	1,275	83,478	82,161	0.0	218,733	85,845
2016	79,896.5	400	10,297.1	51,518.3	84,498	0.0	227,432.5	111,045.6

Source: Environmental and development priority indicators in Iraq Environmental Statistics /2017

Table 2-13. Total of all kinds of fertilizers in all Iraqi Governorates (excluding KRG).

Year	Quantities of Fertilizer in Ton
2014	221,460
2015	155,908
2016	281,399
2017	479,944

source: Ministry of agriculture

Monitoring system for the protection of the marine environment

The total area of Iraq's regional water in the Arab Gulf is 900 km^2 of coastal water and has high levels of pollution (e.g. from nitrogen) which attracts fish, especially during the mating season. It is also the passageway for migrating fish from the Gulf into Iraqi waters entering Shatt al-Arab, Khor al-Zubair and the Marshlands where natural food is abundant. The deterioration of the coastal environment and seawater in Iraq can be attributed to a number of reasons: (i) Arab Gulf water is polluted by oil, which is due to oil supply, loading, unloading, transport and shipping as well as naval mines; (ii) discharge of ballast water from oil tankers and commercial ships into the Gulf contributes to transferring alien species to the area (*Source: NESAP 2013-2017).*

Satellite monitoring by the Regional Organization for Protection of Marine Environment (ROPME)

Iraq is a member of ROBME and the water quality in its maritime area across the Arabian Gulf is monitored by this organization. Oil pollution caused by oil exports by ships in the maritime area is the most prominent issue, so there is a coordinated activity with the Center for Mutual Assistance for Maritime Emergency (MEMAC) to facilitate cooperation among states in the Arabian Gulf to combat pollution of oil and other harmful substances in marine emergencies.

Oil Spill Response Plan (OSRP*)* for the Crude Export Facility, is a project that designed a national Oil Spill Contingency Plan. It aims to define the response strategy, procedure and protective operations to ensure the effects of potential oil spill incidents in the northern Gulf area of Iraq are dealt with in the most appropriate way to minimize environmental damage. Wildlife protection in the areas affected by oil spill event is part of the oil spill response operations and it is included in the planning for response operations.

Monitoring program for air quality

Environmental air pollution monitoring is the responsibility of environmental institutions in Iraq. Numbers of monitoring stations are distributed in the governorates, air samples are taken to calculate the concentration of solid particles, dust, gaseous pollutants including, carbon oxides, nitrogen dioxide, sulfur dioxide and some other pollutants such as volatile organic compounds, hydrocarbons and some heavy metals. The air quality control system in Iraq is still new with limited operating requirements.In addition to the more complex and sensitive recording stations described in the paragraph above there are also 53 stations across Iraq (2-6 per each governorate) which are simpler, fixed to the roof of buildings which record ambient air quality including dust particles concentration.

The available readings of SO2 and NO2 concentrations from stations in Baghdad city are presented below in Tables 2-14 a and b. Both SO2 and NO2 are generated from fuel combustion in Baghdad City. The highest concentrations were recorded in South Baghdad as the result of the existence of Oil refineriey and the electricity power generation plant near to the monitoring station. Other locations are in commercial and residential areas with dense traffic, in populated residential areas.

*Table 2-14a. The annual highest concentrations of **SO2** in numbers from seven air monitoring stations in Baghdad City (in ppm).*

Year	SO_2 in Iraqi Standard	North 1	Centre	South 1	East	South 2	North 2	South West
2016	0.02	0.034	0.04	**0. 773**	0.503	0.013	0.112	0.192
2017	0.02	0.041	0.034			0.097	0.047	0.033

*Table 2-14 b. The annual high Concentration of **NO2** in numbers of air monitoring stations in Baghdad City in (ppm).*

Year	No_2 in Iraqi Standard	North 1	Centre	South 1	East	South 2	North 2	South West
2016	0.02	0. 03	0.29	**1.297**	0.057	0.079	0.023	0.030
2017	0.02	0.04	0.021	**1.049**		0.056	0.144	

(Source: Environmental status 2016,2017)

Pollution assessment in KBA Report 2017

The KBA project identified threats to Iraq's habitats, including identifying sources of pollution at each location (KBA report 2017 - chapter 7). Pollution is one of the threats categorized using the Pressure-State-Response (PSR) Model used by the KBA team to assess the threats within 82 KBA sites (see KBA report 2017 – Methodology on p:37).

The KBA program has always informally documented threats at survey sites, but in the KBA work reported in 2017 teams attempted a more formal assessment, based on eight threat types (out of 11) defined by the IUCN (2014c). The threat categories, each represented with a symbol, are shown in Table 2-10 above. Three threat categories could not be assessed due to lack of information, each threat type was evaluated based on its timing, scope and severity to develop an integrated "Threat Status Score". This score allowed for the rating of the individual threat as one out of four color-coded levels (see Figure 2-36). The full methodology was adapted from one outlined in a Birdlife International (2006) report on Monitoring Important Bird Areas. Sites in Iraq often face several threats of varying scope and severity, maps provide an overview of those areas of the country with the highest threat levels based on eight (out of 11). IUCN defined threat classifications that could be evaluated in the survey. These maps provide merely a rough indication of where more in-depth assessments on pressures to biodiversity and other environmental services should be concentrated (KBA report 2017- Methodology - p:37).

The main pollution threats to sites that the team tried to assess, were municipal and industrial waste and garbage and to some extent agricultural pollutants and noise pollution. Military waste, air, light and thermal pollution threats were difficult for the team to evaluate but are likely significant problems at many sites as well.

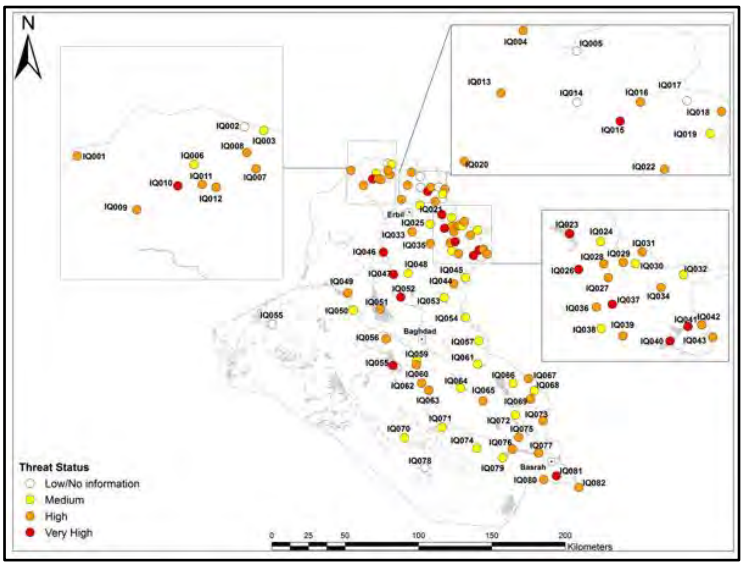


Figure 2-36. Pollution threats as measured during the survey of 82 sites by the Key Biodiversity Area work (KBA report in 2017).

Table 2-15 provides the scoring at each site and each threat based on Timing (Tm), Scope (Sc) and Severity (Sv). Each of these was scored on a scale from 0 to 3 and added together to obtain an Impact Score (see Methodology). The higher the impact score, the higher the threat level.

Impact Score (0 to 9) = Tm Score + Sc Score + Sv Score

Where: Tm = Timing of threat (0 to 3)
Sc = Scope of threat (0 to 3)
Sv = Severity of threat (0 to 3)

Table 2-15 Scoring of threats used in the Key Biodiversity Area work across site 1 in Iraq (KBA report 2017).

Site #	1. Agriculture			2.Residential & comm. develop.			3. Energy Production & mining			4. Trans. & service corridors			5. Over-exploitation, persecution & control			6. Human intrusions & disturbance			7. Natural systems mod.			8. Pollution		
#	Tm	Sc	Sv	Tm	Sc	Sv	Tm	Sc	Sv	Tm	Sc	Sv	Tm	Sc	Sv	Tm	Sc	Sv	Tm	Sc	Sv	Tm	Sc	Sv
1	3	1	1	3	1	1	3	2	3	3	2	3	3	2	1	3	2	2	3	2	3	3	1	2

The KBA report mentioned pollution as one of the main threats in 13 out of the 82 sites that were surveyed. For example, Razzaza lake suffered from pollution caused by a drainage canal that collects sewage and agricultural wastewater from the adjacent areas and is currently one of the only water input sources for Razzaza; so, the pollution was scored as 3 in the Scoping section of threats.

There are clearly a wide range of drivers likely to impact on water and air quality and therefore the wider environment, for example climate change, rainfall shortage, unsustainable soil management, indiscriminate use of fertilizers and pesticides, and the disposal of hazardous land contaminants (such as the remnants of the oil extractive industry and war residues from chemicals and mines). However, there is no nation-wide periodic monitoring program (only individual monitoring programs such as was carried out as part of the KBA report (2017) and no analysis of the impacts of pollutants on biological diversity.

Measures taken to contribute to the implementation of the national biodiversity strategy and action plan

NBT 10: By the end of 2016, a national monitoring programme is established for identification of the main sources and diffusion paths of chemical and physical pollutants in the natural ecosystems and the effects of pollution on natural ecosystems.

Effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been partially effective

The reason of selection the measure's effectiveness

Although there are monitoring stations for pollutants, their sources and methods of diffusion to the environment (and the impacts on the natural ecosystem) have not yet been considered.

Relevant websites, web links and files.

- *NESAP (2013-2017).pdf*
- *Oil Spill Response Plan (OSRP) .pdf*

http://www.moen.gov.iq /6NR/strategies and plans

- *Status of Environment reports on 2014,2015,2016,2017 in pdf*
- *Report on salinity in Shatt Al Arab (in Arabic).pdf*

http://www.moen.gov.iq /6NR/ studies and reports

- *KBA https://www.amazon.com/Key-Biodiversity-Areas-Iraq-Nature/dp/0988651467*

Other relevant information

Case study

Determination of heavy trace metals in tissues of three fish species and two gull species from Derbendikhan Lake, Kurdistan region of Iraq

Heavy trace metals such as arsenic, cobalt, chromium, nickel, cadmium, mercury, selenium and lead, in addition to some micronutrients such as manganese, copper, iron and zinc were analyzed in water, sediment, and tissues of three edible fishes (*Capoeta trutta*, *Arabibarbus grypus*, *Cyprinus carpio*) and two gull species (*Chroicocephalus genei* and *Larus michahellis*) from Derbendikhan Lake in Sulaymaniyah governorate, Kurdistan.

The content of heavy metals in the fish species differed depending on the season, feeding status and sediment quality, which in turn biomagnified in gull tissues. The indices of bioaccumulation factors from water and sediment (BAFw and BAFs), bioconcentration factor (BCF), biogeochemical index (I-geo) and pollution load index (PLI) between concentrations of selected heavy metals in fish tissues, bird organs, sediments and water indicated that there is direct accumulation of metals from the water and sediment to the fish and then to the higher trophic levels (birds). Seasonal variations of heavy metal levels in water and sediment samples indicated high levels during the Spring; however, fish tissues indicated elevated concentrations during the dry season. Sediment results for heavy metals were higher than in water and in the tissues of gull and fish species.

The current study found various metals were present in the fish tissues at levels which exceeded those permitted by WHO/FAO particularly for lead, mercury and zinc. Therefore, the fish from these areas are generally unsafe for human consumption.

Sources of pollution for Derbendikhan Lake include untreated domestic wastes from populations in Sulaymaniyah, from where wastes are discharged to Derbendikhan Lake through Tanjarow River and from populations residing around the Lake and the waste dump site. This is mainly because of the presence of limited infrastructure for the treatment of waste in Sulaymaniyah.

https://www.researchgate.net/publication/329894267_Determination_of_Heavy_Trace_Metals_in_Tissues_of_Three_Fish_Species_and_Two_Gull_Species_from_Derbendikhan_Lake_Kurdistan_Region_of_Iraq

For further details see (https://youtu.be/2GlxxZZVbcs) which shows the waste dump site near Tanjarow river

Obstacles and scientific and technical needs related to the measure taken,

Obstacles:

1. The security situation in some areas of the country restricted the implementation of monitoring programs.
2. Limited research of pollution impacts on natural ecosystems.
3. Lack of experience of pollution assessment and the impact on natural ecosystems.
4. Limited time framework given for implementing this action.

Scientific needs:

More research and capacity building on the impact of pollutants recorded in Iraq on natural ecosystems.

Technical needs:

1. Undertake environmental impact assessments on natural ecosystems on an annual basis.
2. Capacity building (training courses) on the integrated management of natural ecosystem including diffusion of the pollutants and the suitable measures to tackle pollution.
3. Capacity building on the assessment of the effectiveness of the current monitoring programs and design of advanced comprehensive program include all kind of pollutants, the sources and their diffusion pathways.

4. Training in the use of GIS systems to get more accurate (temporally and spatially) information about pollution.
5. Strengthen and equip the Environmental Laboratory requirements in terms of measurement equipment, sampling tools, testing materials with a high level of accuracy to ensure quality control and accurate diagnosis of pollution.

Financial needs:
Financial resources are needed from the international community [e.g. from the Global Environmental Facility (GEF)] to support the action to address the needs mentioned above.

NBSAP A.4.f: By 2016 assessments at the regional level are carried out about the state of ecosystem services with reference to their provisioning, regulating and cultural functions and their importance for urban and rural people. By 2018 management options are developed nationally in order to use them sustainably. By 2020 the regional assessments and the management options are summarized, published and spread.

Measures taken to contribute to the implementation of the action

The functions of ecosystem services (provisioning, regulating, supporting and cultural) were referenced in the Table shown in NBSAP (Action A.2.g), but overall the status of ecosystem services and details and their importance to rural and urban populations has not been assessed.

There is some evidence, however, of the importance of some services in Iraq and management to support Ecosystem Services and these are presented below:

Pollination services

The estimated value (in economic terms) of pollinators in Iraq was assessed by the IPBES pollinator assessment. The second largest crop (by land area) in Iraq are dates (16% of the land area used for agriculture was devoted to this crop in 2016 -FAO agricultural statistics - see also to Figure 2-37) and the fifth largest are apples (2% of the land area in Iraq). Both crops rely on insect pollination (the latter completely and the former partially). In total the IPBES assessment estimated that between 12.5-15% of total agricultural yields in Iraq would be lost without natural pollinators (see Figure 2-37 below). There is thus an urgent need to catalogue which natural pollinators are responsible for crop pollination and to ensure their populations are both close to areas in which they are needed (pollinators travel relatively small distances to neighboring areas to forage and so suitable habitat needs to be available close to crops that need pollination and the population levels of the species need to be of sufficiently widespread and abundant to perform their function.

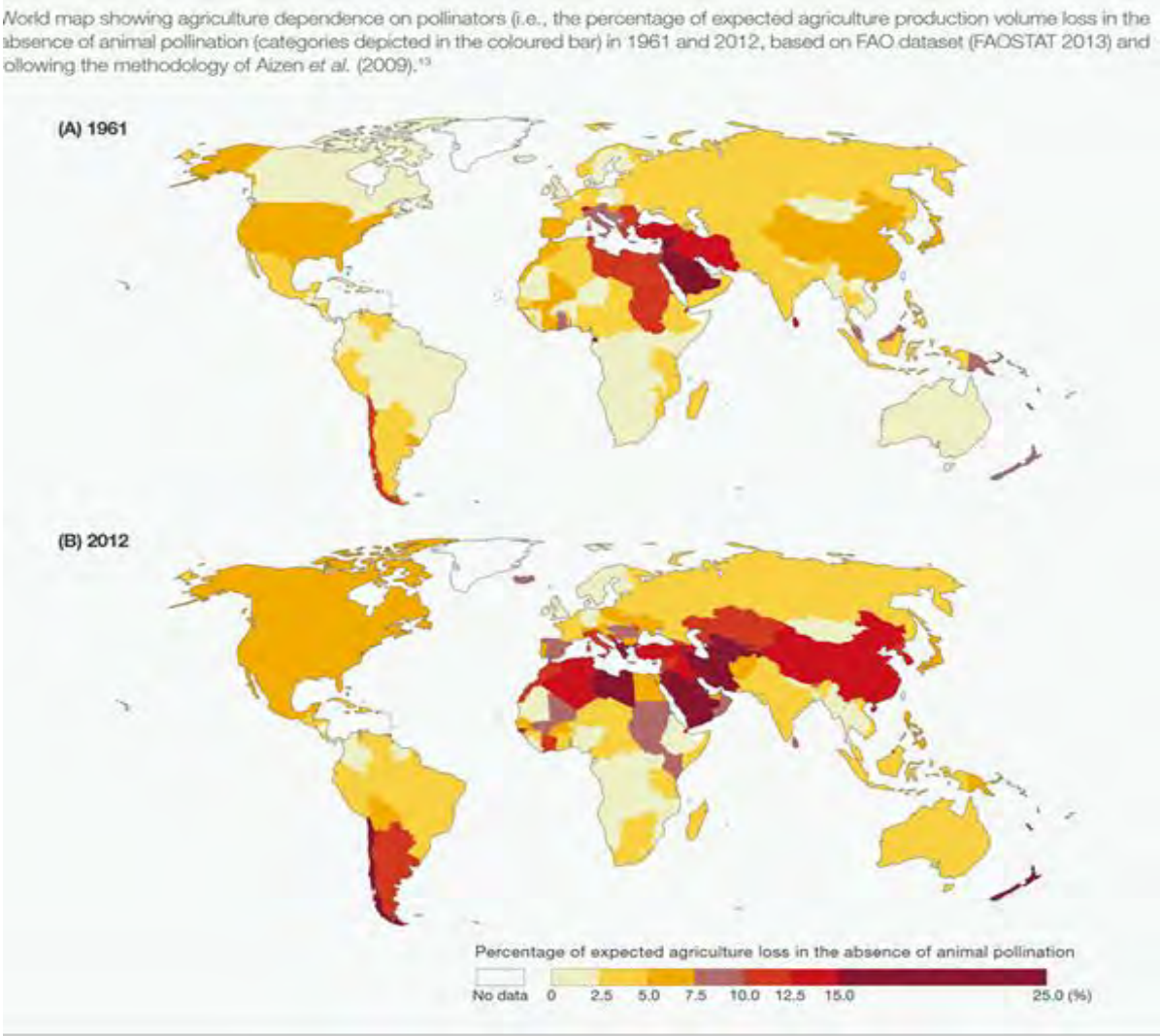


Figure 2-37 Importance of pollination services in Iraq and beyond (from IPBES global assessment of pollinators).

Note that in Iraq in 2012, an estimated 12.5-15% of agricultural yields was lost without animal pollinators. Globally the pollinators (in Iraq) are estimated to be more valuable than average (by land area) based on this figure.

Each year, MoP, issued GIS maps, showing the distribution of quantities of agricultural and productive crops according to the producing governorates such as the dates production map shown below

Dates is considered one of the strategic food crops in Iraq.

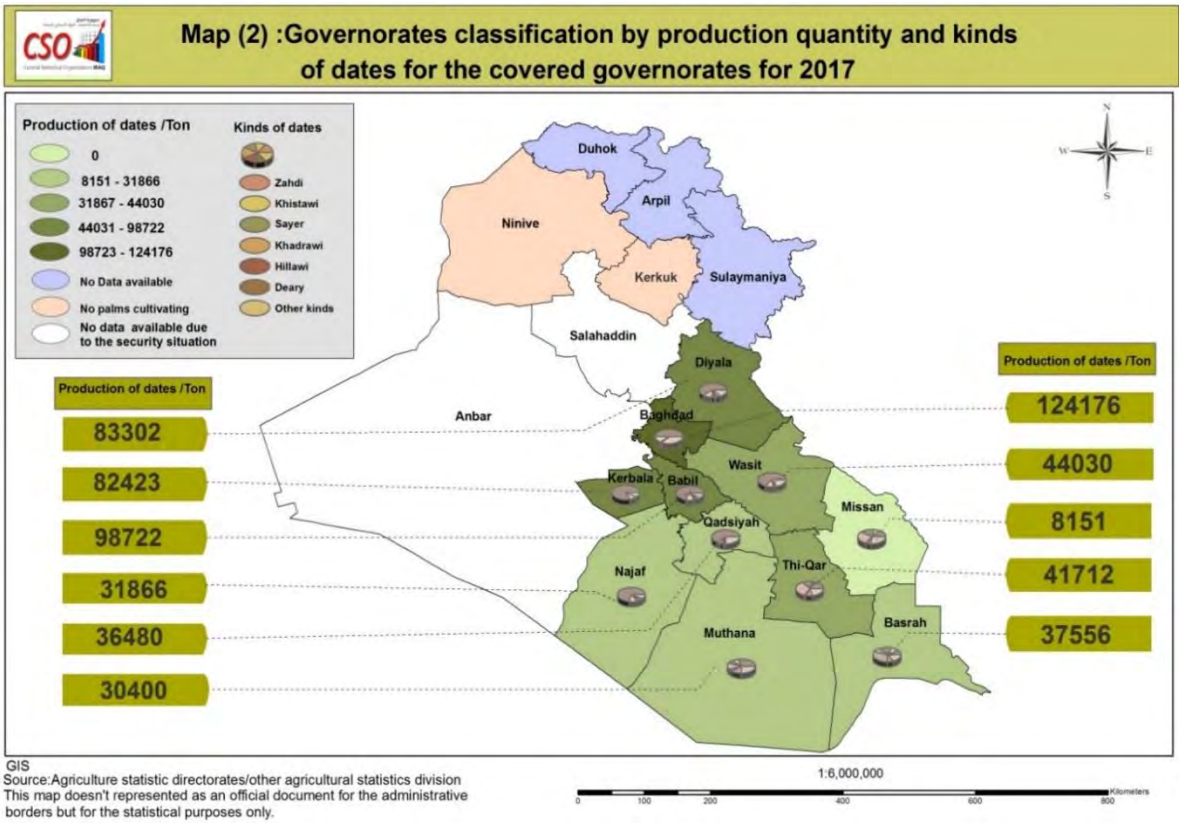
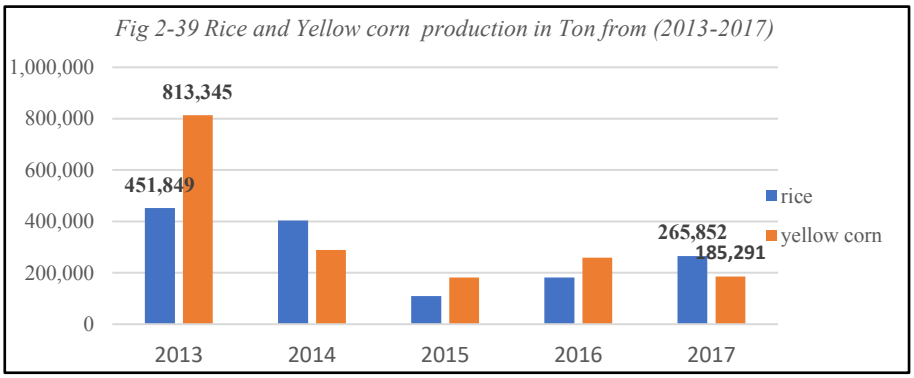


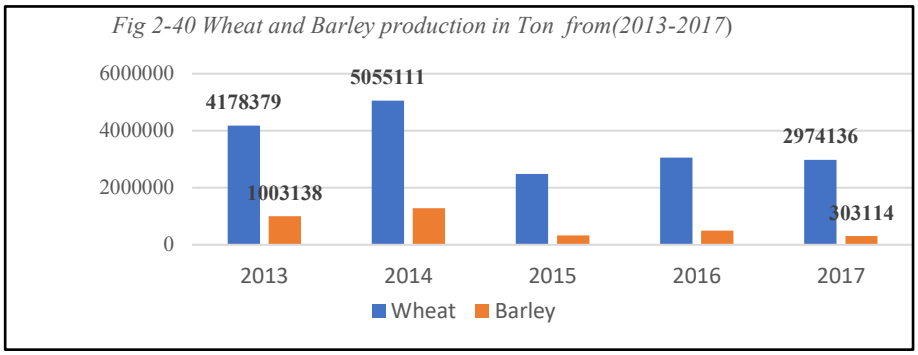
Figure 2-38 Classification of governorates by quantity of dates and their varieties for the governorates covered for the year 2017.

The Ministry of Agriculture has adopted the strategic plan which has set its priorities on producing mainly wheat and barley that account for one-third of national cereal production, but also rice, yellow corn and dates, cotton, vegetables, fruits, legumes and alfalfa. Livestock production has been an important pillar of Iraq's agriculture sector, representing one-third of the total value of agricultural production. Cattle, goats and sheep are the main livestock in Iraq, supplying meat, wool and milk. (*http://www.fao.org/3/ca1511en/CA1511EN.pdf*)

the figures below mentioned the decrease of the production of four products after 2014 because of the impact of conflicts in the cultivation areas

Fig 2-39 Rice and Yellow corn production in Ton from (2013-2017)





(Source: Ministry of agriculture/Agricultural statistics)

For Fishery Production (see Sec IV, Aichi Target 6, Fig 4-1)

Ecosystem services in Marshland

Table 2-16 The main ecosystem services provided by the marshland.

Provisioning services – the goods of products obtained from Marshlands' ecosystem		
Food	Crops	Paddy rice, great millet, dates, vegetables and fruits
	Livestock	Asian water buffalo, cattle, sheep, water-buffalo milk and yogurt
	Capture fisheries	Shrimp, yellowfin sea bream, khishni
	Aquaculture	Cyprinids, grass carp, shellfish
	Wild foods	Wild boar, waterfowl (coot, teal), desert monitor
Freshwater	Freshwater for drinking, cleaning, cooling, and transportation (canoeing and boating)	
Fiber and fuel	Fiber	Reeds for housing and mats; date palm wood
	Fuels	Reeds, crude oil, cattle dung
Biochemical	Potential use of Marsh flora extracts, native herbs for pharmaceuticals and pest control	
Genetic materials	Resistance and breeding of native plant and animal species	
Regulating services – the benefits obtained from the Marshland ecosystem's control of natural processes		
Climate regulation	Moderation of the national rainfall patterns and control desertification and dust storms	
Water regulation	Hydrological flows	Storage and retention of water flowing from Euphrates-Tigris system upstream and tidal flow downstream; Permeable clay and silt facilitates recharge of the Recent Alluvium aquifer
	Water purification and waste treatment	Removal of harmful pollutants from water by trapping metals and organic materials; soil microbes degrade organic waste rendering it less harmful
Erosion regulation	Reeds, grasses and estuarine vegetation retain soils and sediments	
Natural hazard regulation	Marsh areas naturally absorb seasonal floods and tidal surges; moderation of drought at a local scale	
Pollination	Habitat for bees and birds, the key pollinators of economically important crops	
Cultural services – the nonmaterial benefits that Iraqis obtain from Marshlands ecosystem		
Ethical values	Customs, oral traditions, knowledge and rituals attached to the use of the land and rivers; Iraqi tangible and intangible cultural heritage; an area of global importance	
Recreation and tourism	Canoeing, bird and wild-life watching, recreational fishing, archaeological site visitation, Marsh communities	
Aesthetic	Globally significant natural beauty	
Educational	Science, cultural awareness, specialized vocational training, public awareness of national, regional and global importance	
Supporting services – the underlying processes that are necessary for the production of all other ecosystem services		
Soil formation	Retention of sediment, recycling and supporting the health of the ecosystem	
Nutrient cycling	Returning phosphorus, sulfur and nitrogen to Iraq's atmosphere, water and soil	

Iraqi community in general. These include the provision of food, clean water and climate change control. The daily life of the Marshland communities is organically connected to the roles played by marshes on both natural and cultural levels, therefore maintaining a balanced approach towards the development of the area requires a strong recognition for such services and benefits.

Source: Managing change in the Marshlands: Iraq's Critical Challenge, United Nation white paper report for then United nations Integrated water Task Force for Iraq. UN,2011

A proposal for sustainable management options of the Marshlands in Iraq has been prepared. This includes the following:

1. Supporting the agricultural and economic development in the Iraqi marshes to encourage the marsh dwellers to achieve self-sufficiency from the vegetative and protein food items such as (Aquaponics) which is likely to reduce the need for local marsh dwellers to leave their homes by providing good job opportunities through the use of Aquaponics.

2. Ensuring the sustainable use (not depleting) of key resources including Common Reed, Phragmites, silt, plants and animals. The materials produced will no longer be freely available, but the largest share will be under the government control and the supervision of specialized economic and industrial staff.

3. In some countries, traditional medicine remains an integral part of the formal health system and exists on an equal level with modern medicine. Traditional medicine has an important role in health care in Iraq especially in rural and desert areas and practiced by what is called Attar (Herbalist). Refer to this research.

https://www.academiascholarlyjournal.org/ijaham/publications/aug14/Nedhal_A_Al_Douri.pdf

4. Encouraging the marshland dwellers to limit the levels of overhunting of native fish and migratory birds by supporting the area financially by implementing the following project proposals:

First: aquaculture (Aquaponics).
Second: production of the Mesopotamian catfish *Silurus Triostegus.*
Third: the breeding of worms for the production of fish, especially earthworms and micro worms.

Measures taken to contribute to the implementation of the national biodiversity strategy and action plan

NBT 16**:** By the end of 2016, a national assessment is published of the state of provisioning, regulating and cultural services supplied by natural ecosystems and their importance for rural and urban people and on management options to be developed for the sustainable supply of ecosystem services.

Effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been partially effective.

The reason of selection the measure's effectiveness

Up to date, there is no assessment have been done for the ecosystem services status and the deadline was passed, but there were some management options developed (see above)

Other relevant information

Case Study

Evaluation of the Ecosystem Services of the Central Marsh in Southern Iraq

Feeding the Water Buffalo © Omar Al-Sheikhly

Ecosystems provide humans with services that include benefits from food, fresh water, climate regulation, and socio-economic assets. The Mesopotamian marshlands are among the largest wetlands in the Middle East and they provide various benefits both in terms of ecosystems and its services. However, ecosystem services of the Marshlands are consistently undervalued in the national economic analysis and decision making. This study is a novel attempt to present the Central Marshes, the first National Park in Iraq, as the first model for ecosystem services valuation in Iraq. The Toolkit for Ecosystem Services Site-Based Assessment (TESSA) was adopted for the determination of biophysical and economic values of such services at the site level. Data on the trading of fish, harvested plants, water buffalo milk, and fodder were collected by conducting six months of monitoring of local economic activities. the ecosystem services were valued of the surveyed area within the CM (40,000 ha) to have a total value of 860,078.23 USD during the six-month survey period in 2014.

This estimated total value had contributions of 86,637.25 USD from harvested plants,551,334.80 USD from trading fish, 167, 303.70 USD from trading water buffalo milk, and 54,804.00 USD from trading fodder.

The results provided greater understanding of the ecosystem services contributed by the Central and has highlighted the crucial role of nature in supporting sustainable well-being for humans living in the area. In addition, the results can be used to support local policy on establishment management plans of the National park, and to estimate lost and damage that could result from impact of climate change on that area.

Nadheer A. Fazaa[1&2], Jonathon C. Dunn[2], Mark J. Whittingham[2] "Evaluation of the Ecosystem Services of the Central Marsh in Southern Iraq
https://www.iasj.net/iasj?func=article&aId=153109

Information and monitoring of key ecosystem services is needed. Examples are shown below including water security (Fig 2-41) and Carbon Storage (Fig 2-42).

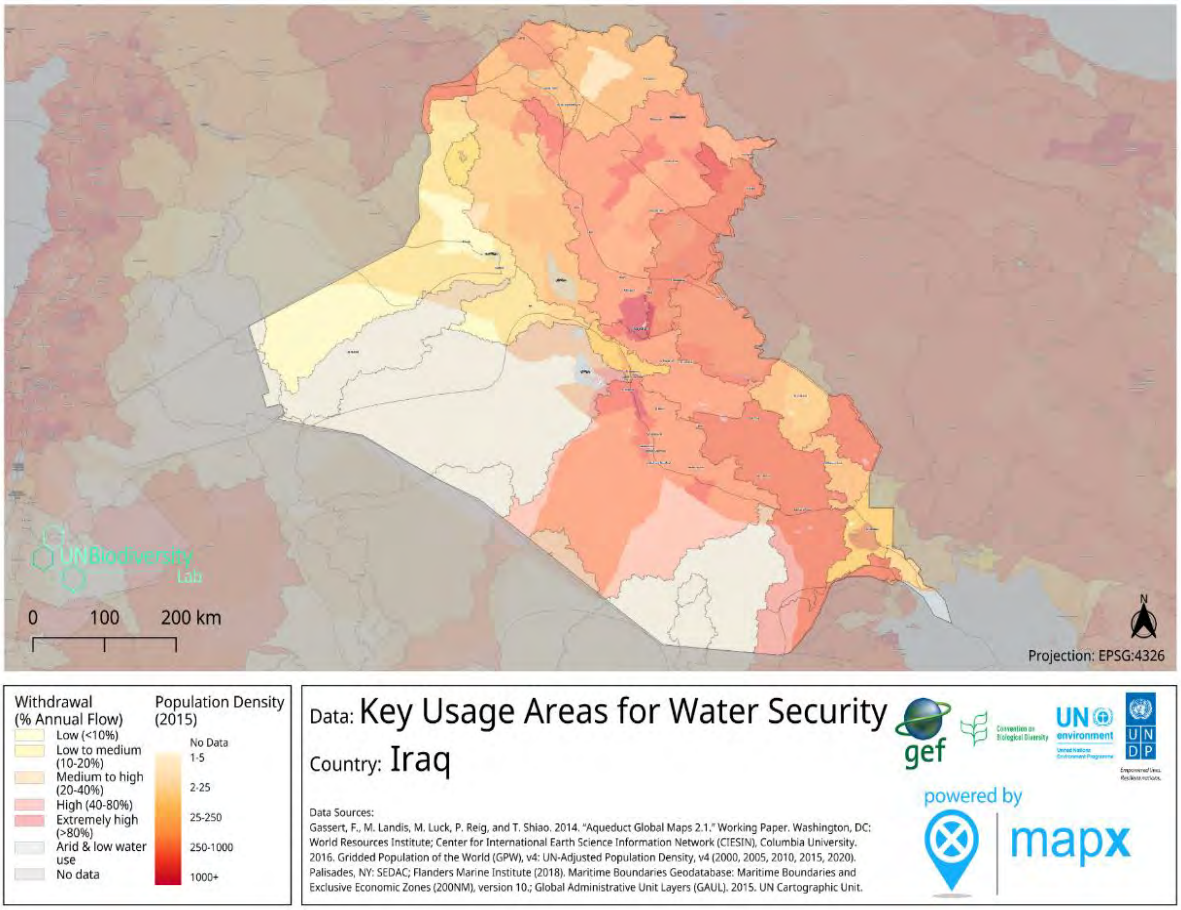


Figure 2-41 Water security is a combination of demand (from proximity to human population density) and supply (water resources).

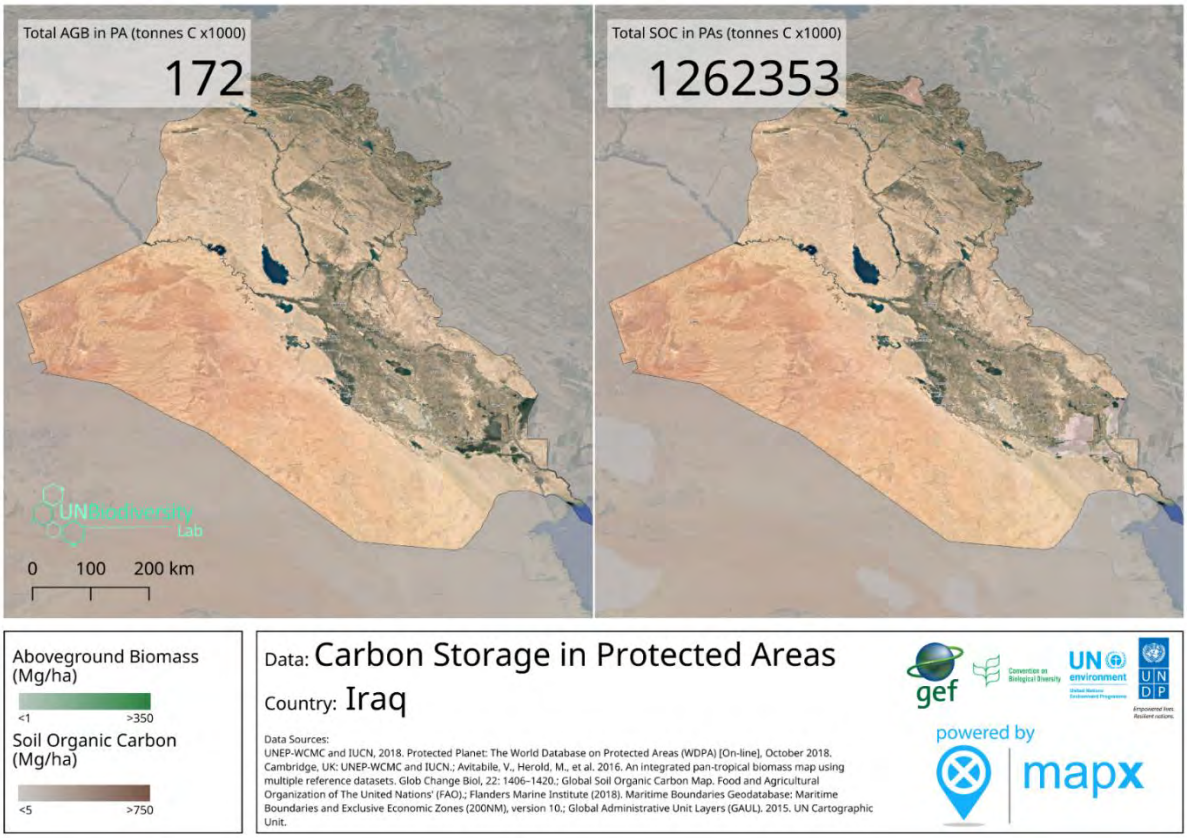


Figure 2-42 Carbon storage in protected areas in Iraq. One of the key ecosystem services that need to be considered in land management strategies.

Obstacles and scientific and technical needs related to the measure taken,

Obstacles:

1. Limited awareness and understanding by decision makers about ecosystem services and their economic, social and ecological benefits.
2. Lack of comprehensive surveys of all services and their uses by rural and civil communities throughout Iraq, especially in areas subject to critical security measures.
3. Lack of assessment of the financial values provided by ecosystems to rural and urban people.
4. Lack of availability of studies and research in the field of ecosystem services and management.

Scientific Needs:

1. Training on the methods of calculation of financial values and assessments of the status of ecosystem services.
2. Studies on the kinds of ecosystem services needed for women, indigenous and local communities and the poor and vulnerable.
3. Studies of key ecosystem services and how best to manage land to take different areas into account, in particular, carbon storage, water (both quantity and quality), pollination and cultural values.

Technical Needs:

1. Capacity building in ecosystem management and development areas of utilizing their service
2. Need to build capacity for technical skills and professional expertise to:
    - Updating of the natural, semi-natural and modified ecosystem services categories and
    - Identification of all threats to natural ecosystems and their services
3. Awareness to encourage the role of women in benefiting from the services provided by natural ecosystems in Iraq.

NBSAP A.4.g: By 2018 fill data gaps about identification, extent, condition and protection status of the natural, semi-natural and human modified habitats by collecting the missing information and store these data in a GIS database. By the end of 2020 to deliver and share the complete GIS database containing the information on the natural, semi-natural and human modified habitats.

Measures taken to contribute to the implementation of the action

MoHEnv has created a format to collect the missing information about the natural, semi-natural and human modified habitats (see Annex 3). The efforts are continuing to fill the missing information and store them in a database in MoHEnv. The complete GIS database is expected to be completed by the end of 2020.

Contribution to the Aichi Biodiversity Targets or National Targets

NBT 5: By the end of 2020 a GIS database of the extent, condition (i.e. healthy or degraded) and protection status of the natural (not altered by human intervention), semi-natural and human modified habitats of Iraq has been developed has been developed.

Effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been partially effective.

The reason of selection the measure's effectiveness

- MoHEnv survey format was produced to collect additional information to add to the GIS database. This adds to the information gathered by the KBA assessment report to fill gaps related to natural, semi-natural, and modified habitats and their conservation.
- The above work depends on the availability of financial and security conditions necessary to complete the survey.
- The in-country experience of GIS use is limited and there is an urgent need for training in this area.

Relevant websites, web links and files

- *KBA*

https://www.amazon.com/Key-Biodiversity-Areas-Iraq-Nature/dp/0988651467 -

Other relevant information

Case Study on using GIS in Land degradation evaluation

Environmental degradation assessment in arid areas: a case study from Basra Province, southern Iraq.

Evaluation of recent land degradation affecting Basra Province, Iraq, (https://link.springer.com/article/10.1007/s12665-013-2290-6) used four indicators of environmental degradation severity (vegetation cover, extent of drifting sand, urbanization rate, and population pressure) to identify five prominent environmental degradation processes: desertification, secondary salinization, urbanization, vegetation degradation, and loss of wetlands. This analysis was carried out using '3S' technologies [remote sensing, geographic information system (GIS), and global position system], with the layers extracted and manipulated from available topographic, climatic, and soil maps, as well as satellite image (thematic mapping in 1990 and enhanced thematic mapping in 2003) and field survey data analyses. Rates of conversion were calculated, and distribution patterns were mapped with the aid of a GIS software system (ARC GIS) and statistical software (SPSS). The results are presented in Figure 2-43 and revealed that land use changes have affected the wider environment and accelerated land degradation, with severe damage located in southwestern Basra Province representing 28.1 % of the total area. Areas of high to moderate degradation characterize the rest of the south, representing 52.7 % of the total area; while the north of the study region is characterized by very low and low degradation levels accounting for 8.5 and 10.7 %, respectively.

Table 2-17 Categories of environmental degradation and the proportion of the study region to each

Class	Area (km^2)	%
Very low environmental degradation	1,620.9	8.5
Low environmental degradation	2,040.5	10.7
Moderate environmental degradation	3,604.2	18.9
High environmental degradation	6,445.6	33.8
Severe environmental degradation	5,358.7	28.1
Total	19,070	19,070

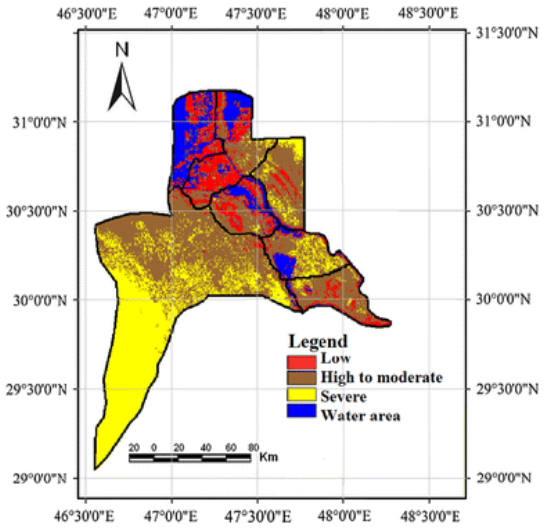


Figure 2-43 Environmental degradation assessment in Basra

https://link.springer.com/article/10.1007/s12665-013-2290-6

The case study above shows how spatial mapping and analysis can be used to understand past changes in land use and environmental quality. Such an approach can be expanded to predict future land use changes and thus help with informed future decision making. The aim of Target 5 is to produce just such a GIS system that can be used as a decision support tool.

Obstacles and scientific and technical needs related to the measure taken,

Obstacles:

1. Coordination between stakeholders including research institutions and civil society organizations on information exchange is an obstacle.
2. Governorates that are under high-security conditions (e.g. Mosul, Anbar) cannot be covered by surveys.
3. Limited technical expertise in spatial mapping.

Technical needs:

1. Training in the use of spatial mapping software (e.g. GIS) and decision making across different metrics (e.g. multi-criterion decision making).
2. Training on field survey methods (for biodiversity and threat recording).

Financial needs:

1. Financial resources needed to support the above – mainly for staff training and field work survey requirements such as survey equipment/computing hardware and software.
2. More resources needed to designate and measure the effectiveness of protected areas.

NBSAP A.4.h: By 2018 the existing list of invasive species of Iraq (published in the 5NR) is reviewed and updated. By 2020 research is completed and published to ascertain the status of each species, the impact and invasion pathways of the 30 most dangerous/problematic (known or assumed) alien species of the list.

Measures taken to contribute to the implementation of the action

The list of invasive alien species published in the fifth national biodiversity report is updated based on the recent published literature, some species are added, and others deleted (see the updated list which consist of 119 species in Annex 4**(**.

These species have been omitted from the list and include (5 plants) and one species of reptiles:

A- Plants

1. *Capsella bursa-pastoris* –the distribution of this species mentioned in Flora of Iraq Vol. 4 part 2. Page. 972
2. *Lolium temulentum*- the distribution of this species mentioned in Flora of Iraq Vol. 9. page. 98
3. *Imperata cylindrical* - the distribution of this species mentioned in Flora of Iraq Vol. 9. page 534
4. *Emex spinosa* - the distribution of this species mentioned in Flora of Iraq Vol. 5 part 1. page 430
5. *Cyperus rotundus*- the distribution of this species mentioned in Flora of Iraq Vol. 8. page 430

(The historical information for the above Flora of Iraq is mentioned in a separate document refer to the link *invasive alien plants in Iraq.pdf* (*www.moen.gov.iq/6NR/Reports and studies)*

B- Reptile.

Brahminy blind snake *Ramphotyphlops braminus* deleted from the list according to Ali Al-Barazengy (Pers. comm. Dec 2018**(**. The synonym *typhlops braminus* was mentioned by (Corkill, 1932), he considered the only specimen recorded from Basra that may have come from India by importation, but (Afrasiab and Ali, 1996) collected specimens from Baghdad believed that Corkill's suggestion was inadequate since it is unreasonable to assume that such a small blind sluggish and burrower snake could extend its range about 600 km (from Basra to Baghdad) within 50 years. Also, the distribution range in the Middle East especially in United Arab Emirates (UAE), Kuwait and Iran (The Reptile Database) may mean it should not be treated as an Alien species.

Relevant websites, web links and files

- *Afrasiab, S. and Ali, H. A. Notes on scolecophidians (Blind snakes) reptilian- serpents, of Iraq. Bull. Iraq nat. Hist. Mus. Vol.8. No.4, pp:3-39. 1996. Cited by Habeeb and Pouyani, 2016. Geographical distribution of the snakes of Iraq. Mesop. environ. j. 2016, Vol.2, No.3: 67-77.*
- *Corkill, N. L. Snakes and snake bite in Iraq. Baillière, Tindall and Cox., London. 1932.*
- *The Reptile Database: Retrieved from http://reptile-database.reptarium.cz/ / on Dec. 2018*
- *Townsend, C. C., and Guest, E. (1980). flora of Iraq. V. 4(2) Bignoniaceae to Resedaceae. ministry of agriculture and agrarian reform, Baghdad.*
- *Townsend, C. C., and Guest, E. Al-Rawi, A. (1968). flora of Iraq. V. 9. Gramineae. ministry of agriculture and agrarian reform, Baghdad*
- *Townsend, C. C., Guest, E. (1985). Flora of Iraq. V. 8. Monocotyledons excluding Gramineae. Ministry of Agriculture and AgrarianReform, Baghdad*
- *Ghazanfar, S. A., Edmondson, J. R., Mohammed Zain Al-Abdeen Mohammed Raoof, M. Z. M. (2013) Flora of Iraq. V 5: Elatinaceae to Sphenocleaceae. Ministry of Agriculture and AgrarianReform, Baghdad*

Contribution to the Aichi Biodiversity Targets or National Targets

NBT 19: By the end of 2020 the list of invasive species of Iraq and their impacts and invasion pathways have been published

Effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been partially effective

The reason of selection the measure's effectiveness

Measure taken has been partially effective due to:

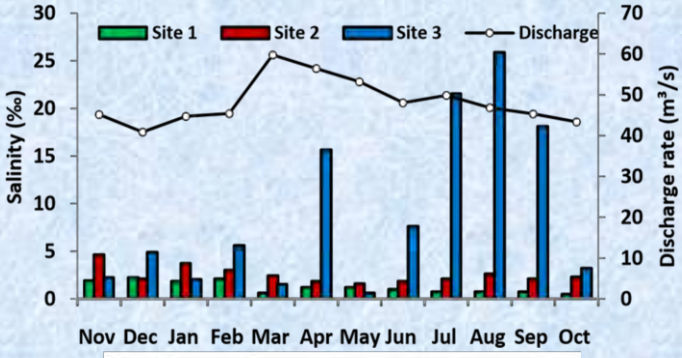
Published research was insufficient to ascertain the second part of the action (invasive status, the impact and invasion pathways of most of the invasive species).

Other relevant information,

Dispersal of the exotic fish in the Shatt Al-Arab River, Iraq

The dispersion of exotic fish species in the Shatt Al-Arab River, Iraq were described. Fish were sampled monthly from three sites using different fishing gear from November 2015 to October 2016. Variation amongst sites in water temperature were not statistically significant, but salinity showed a spatial gradient along the length of the river. The overall values of salinity in the three sites were 1.2, 2.5 and 9.1‰, respectively. Twelve exotic species were collected from the upper site, 11 species from the middle sites and four species from the lower site belonged to four families, namely *Cyprinidae, Cichlidae, Poeciliidae and Heteropneutidae*. The general trend was a decrease of exotic fish abundance from upper site to lower site. The most abundant exotic species in the river were *auratus*, comprising 13.2% of the total catch, *aureus* (12.6%) and *zillii* (8.2%). The diversity index of exotic species in the river ranged from 1.07 to 1.55 and the richness index from 1.07 to 1.16, whereas the evenness index varied from 0.49 to 0.71. The study revealed that the fish assemblage of the Shatt Al-Arab River was clearly shifted in the percent of exotic and marine species and the dominancy species compared with the previous status as a result of the decline in rate of discharge of freshwater during recent years.

Figure 2-44 Monthly variations in salinity and discharge rate in different months



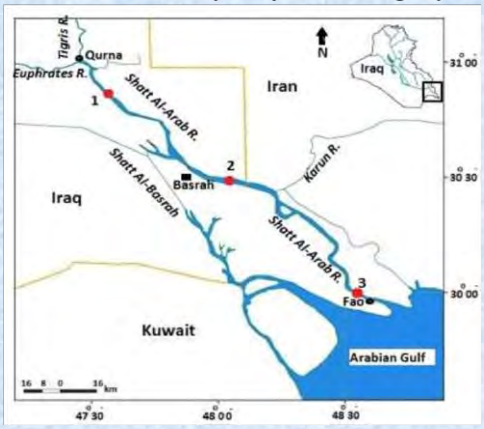


Fig 2-45. Map of Shatt Al-Arab with locations of study sites

https://www.researchgate.net/publication/319356745_Dispersal_of_the_exotic_fish_in_the_Shatt_Al-Arab_River_Iraq?

Obstacles and scientific and technical needs related to the measure taken,

Obstacles:
Governorates with high-security conditions (e.g. Mosul, Anbar) could not be covered by surveys.

Needs:

1. The need for a national monitoring program to control invasive alien species.
2. There is a need for more academic research and field surveys on invasive species, including their impact and distribution across Iraq.
3. Training on the field survey methods for the investigation of alien species in Iraq.
4. Technical assistance to develop programs for identification of invasion pathways for taking appropriate measures of ecosystems control.
5. Better understanding from the lessons learnt by other countries in order to improve the above actions (1-4 above).

Financial needs:
Financial resources to support the above.

NBSAP A.5.a: By the end of 2016 at least one training workshop on PAs management has been completed and other two workshops are planned.

Measures taken to contribute to the implementation of the action

Workshop 1
A workshop entitled "Concepts of Nature Reserves in Iraq" was held at the College of Science for Women / University of Baghdad on Monday and Tuesday, 12-13/10/2015. This workshop focused on the importance of protected areas as well as the risks to biodiversity in Iraq. Information about other countries who have established protected areas to preserve their natural environments was one of the focused area.
Capacity building of the qualified people to work for nature reserves and who understand recent international scientific concepts was also considered. The workshop was attended by a group of university professors and representatives from the MoHEnv, MoHEST and a representative of the Prime Minister's Office, including participation by a proportion of women.

Workshop 2
A workshop on protected areas in Iraq was held on 21 Dec 2016 in the Directorate of Environment in Baghdad. The purpose was to train and build the capacity of the staff of the Directorates of Environment in the provinces, in addition to representatives from related ministries. The workshop included lectures on the role of management of protected areas in the conservation of plant and animal species, especially endangered species in the sites declared in the World Heritage List, it was recommended on the importance of increasing the awareness of marsh communities and how to raise the cultural level and preserve the natural resources in these areas. The workshop also recommended the need to describe the benefits of protected areas to local governments and provincial councils and emphasized the need to provide financial and logistical support for natural sites to be protected.

Workshop 3
On 22 December 2016, a workshop was organized by NI (NGO), Kurdistan Botanical Foundation and the Persian Wildlife Heritage Foundation (PWHF) entitled 'Peace Park Creation for the conservation of Leopards and Wildlife of QaraDagh and Darbandikhan area'. This workshop was a part of the Project of Conservation of the Persian Leopard. The aim of the workshop was to explain the purpose and specific objectives of the Project.

Contribution to the Aichi Biodiversity Targets or National Targets

NBT13: By the end of 2014, at least three training workshops on protected areas management have been conducted.

Effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been effective

The reason of selection the measure's effectiveness

The three training workshops (all carried out within the specified time period) served to develop skills and expertise in the management of protected areas through coordination with the scientific universities and with civil society organizations and KRG/EPIB.

Relevant websites, web links and files

- *http://csw.uobaghdad.edu.iq/?p=602*
- *http://csw.uobaghdad.edu.iq/?p=602*
- *http://kurdistanbotanical.org/content/peace-park-creation-conservation-leopards-and-wildlife-qaradagh-and-darbandikhan-area*
- *Workshop 2 on Protected Areas in Iraq.pdf*

http://www.moen.gov.iq /6NR/studies and reports

Other relevant information

International Collaboration for the Conservation of the Persian leopard

Experts from the Persian Wildlife Heritage Foundation visited Iraqi Kurdistan for the period December 14-22, 2016 to discuss the protection of the Persian Leopard and its habitats outside Iran. The visit included discussion, advice and study of ways to design a common protected boundary between the two countries (Peace Park). Field visits were conducted in Qara Dagh, Huraman and Halabja areas for general familiarization and to identify habitat, set boundaries and familiarize with local communities. On the last day of the visit, a one-day workshop was organized on the establishment of the Peace Shield for the Protection of Tigers and Wildlife in Kara Dagh and the Darbandakhan area, with the participation of government agencies including environment officials, local police and other officials working in Sulaymaniyah Governorate. Experience was also presented on the establishment of government reserves, non-governmental reserves and private sector reserves in Iran and the presentation of IUCN classifications and standards in the area of protected areas. The visit was organized as part of the cooperation between Nature Iraq and the Kurdistan Botanical Institution.

https://www.facebook.com/pg/KurdistanBotanicalFoundation/photos/?tab=album&album_id=131813515

Obstacles and scientific and technical needs related to the measure taken,

Obstacles:
Limited experience by concerned Iraqi officials and stakeholders about protected areas management.

Scientific needs:
Need to utilize national and international expertise to enhance capacity building on the management of protected areas and successful management of endangered species.

Technical needs:
Supporting civil society organizations in conducting training workshops and awareness campaigns.

Financial needs:
Financial allocation is required to conduct training programs for the relevant officials, staffs, stakeholders as well as mobilizing campaigns for local communities on Protected Area management and endangered wildlife.

NBSAP A.5.b: By 2016, at least one training has been organized for the Governorate employees to raise their awareness about the importance of traditional knowledge and bio-diversity conservation.

Measures taken to contribute to the implementation of the national biodiversity strategy and action plan

1. A number of activities were held as part of NI project in 2015 called "Jensen Project Helping to Protect the Natural and Cultural Heritage of the Mesopotamian Marshes: Empowering Iraq's First National Park":

   1.1 Training workshop about producing and marketing handicraft goods was undertaken. The training was an introduction to the types and techniques of the handicrafts as well as their internal and external marketing outlets and how to handle those goods according to the customer type. The training targeted local stakeholders, LCGs, community leaders and governmental decision-makers (local and ministerial).

   1.2 An unprecedented study in Iraq to evaluate traditional handicrafts market of the National Park area was conducted. Solutions were suggested to handle the problems, training groups for local producers was conducted, and opening communication channels between producers and retailers was developed to provide opportunities for marketing of local goods especially those produced in the National Park.

   1.3 Groups of men and women involved in handicraft production (e.g. carpets, rugs, weaving, cold ceramics and souvenirs) has been developed to help uplift the living standards of the locals in the National Park area, to reduce the pressures on the marsh natural resources and to revive almost dying handicrafts in the area.

   1.4 A group of qualified trainers from the governmental centre for vocational training, located in the Central Marshes, has been developed and the training was admitted to the centre's training curriculum of making
   carpets, rugs and cold ceramics. The centre targets the local youth to help them with their living (earning potential) to reduce the pressures on the marsh natural resources.

   http://www.natureiraq.org/uploads/5/2/9/9/52997379/ni_activities_report_for2015english_final.pdf

2. The Mesopotamian Marshlands were selected by MoHEnv and nominated as a World Heritage site in 2016; this was based on a social component to encourage TK use by the local communities. A national team was established in 2018 from related governmental institutions including academia, based on a UNESCO project (The southern marshes are the sanctuary of biodiversity and the preserved landscape of the Mesopotamian cities), a number of meetings and presentations were organized on TK, a booklet was also issued (see NBSAP A.1.h).

Contribution to the Aichi Biodiversity Targets or National Targets

NBT 22: By the end of 2020, a survey of indigenous and local communities' traditional knowledge, use and practices relevant for the conservation and sustainable use of biodiversity is published.

Effectiveness of the implementation measure taken in achieving desired outcomes

☒ Measure taken has been effective

The reason of selection the measure's effectiveness

The measures are considered a good step as TK concept is still new, more effort needed to cover other regions in Iraq.

Obstacles and scientific and technical needs related to the measure taken
Obstacles:

1. TK is considered a relatively new concept and was not integrated into the related ministries' strategies and action plans.
2. Cooperation between all related stakeholders is an obstacle.
3. Security condition in different parts in Iraq to reach local communities is a major challenge.

Scientific needs:
More research needed on knowledge management.

Technical needs:

1. Technical assistance to design a program involving all relevant governmental institutions, NGOs, media and local communities to develop strategies and action plans for preparation of comprehensive database on Traditional Knowledge in Iraq.
2. Support to achieve awareness activities (e.g. campaigns, trainings) with adequate awareness tools.
3. Lessons learnt and successful practices from other countries.

Financial support to achieve the above needs.

NBSAP A.5.d :By 2020 a set of trainings are organized targeting the academics, researchers, field teams, local organizations of volunteer or conservation groups, technical employees from governmental bodies, focusing in particular on the following: - Ecosystem services and human well-being - Invasive alien species - Protected areas management - Habitat loss - Assessment methodologies for field work and data collection - Analysis techniques and trend estimations - Building indicators - Environmental standards - Sustainable development

Measures taken to contribute to the implementation of the national biodiversity strategy and action plan

refer to the measures in NBSAP A.1.b

NBSAP A.5.c: By 2020 a set of inter-ministerial conferences addressing crucial biodiversity issues are organized, referring in particular to:

- Ecosystem services and human well-being
- Invasive alien species
- Protected areas management
- Habitat loss
- Pollution
- Sustainable development

NBSAP A.5.e: By 2020 a set of inter-ministerial trainings are carried out about the international guidelines and policies concerning the environment, their relevance and implementation in the Iraqi context.

Measures taken to contribute to the implementation of the national biodiversity strategy and action plan

No measures taken

Effectiveness of the implementation measure taken in achieving desired outcomes

☒ unknown

The reason of selection the measure's effectiveness

Such high-level events need to be organized when the circumstances of Iraq are stable. Attempts to do so, should conditions allow, will be undertaken within the deadline.

Section III. Assessment of Progress Towards Each National Target.

NBT 1: By 2020, 25% of urban and rural people have awareness of the status of biodiversity, its benefits for people, the pressures that affect it, and the actions they can take for its conservation and sustainable use.

Progress towards the implementation of the selected target:

☒Progress towards target but at an insufficient rate

Date the assessment was done:

June 2018.

Indicators used in this assessment

The indicator: 25% of urban and rural people are aware of the status of biodiversity.

Level of confidence of the above assessment

☒ Based on comprehensive evidence

Explanation for the level of confidence indicated above.

There is limited action taken to reach this target caused, in part, by the critical security conditions. MoHEnv established awareness groups in each governorate in Iraq (linked to Action A.1.c), the group consists of multi sectors from related governmental departments (agriculture, water resources, education), media and NGOs. The roles and responsibility of these groups were identified, but the actions taken to raise awareness of the community in urban and rural areas are limited due to limited financial resources to organize awareness campaigns (with tools such as posters and other publications) and to the security conditions in many parts of Iraq. So, the target rate of 25% is very challenging under these circumstances.

Adequacy of monitoring information to support assessment

☒ No monitoring system in place

NBT 2: By 2020, 50% of policy makers and planners have awareness of the status of biodiversity, its benefits for people, the pressures that affect it, and the actions they can take for its conservation and sustainable use.

Progress towards the implementation of the selected target:

☒ Progress towards target but at an insufficient rate

Date the assessment was done:

June 2018.

Indicators used in this assessment

Percentage of policy makers and planners with awareness of the status of biodiversity.

Level of confidence of the above assessment

☒ Based on comprehensive evidence

Explanation for the level of confidence indicated above.

This assessment is based on comprehensive evidence on what has been achieved through workshops organized by related ministries which targeted a small number of policy makers. More efforts are needed to engage other

decision makers and planners in institutions responsible for the development of national plans. The focus needs to be on raising awareness on biodiversity, the benefits derived from nature and the actions needed to conserve it.

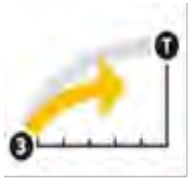
Adequacy of monitoring information to support assessment

☒ No monitoring system in place

NBT 3: By the end of 2015, a national survey of tools used for public awareness of biodiversity is completed.

Progress towards the implementation of the selected target:

☒Progress towards target but at an insufficient



Date the assessment was done:

June 2018.

Indicators used in this assessment

- National survey of tools used for public awareness of biodiversity is completed.
- Numbers of films, documentaries, publications, educational programs, guidance materials and trainings.

Level of confidence of the above assessment

☒ Based on comprehensive evidence

Explanation for the level of confidence indicated above.

There is no specific survey completed by 2016, however an inventory of existing awareness tools that the ministries and civil society organizations developed is needed. These tools are used as part of their efforts to achieve their biodiversity and environment awareness programs. These actions are to help achieve action A.1.a. related to this target; this requires a comprehensive review to be carried out about the existing tools that are currently available and used in Iraq.

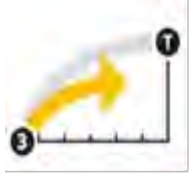
Adequacy of monitoring information to support assessment

☒ No monitoring system in place

NBT 4: By 2020 the use of tools (films, publications, educational programmes, guidance materials, and training) for raising awareness of biodiversity is improved with locally defined, area based and targeted awareness programs (e.g. governorate level).

Progress towards the implementation of the selected target:

☒Progress towards target but at an insufficient rate



Date the assessment was done:

June 2018

Indicators used in this assessment

1.Locally defined, area based, and targeted awareness programs developed.

2.The use of and number of films, documentaries, publications, educational programs, guidance materials and trainings are increased.

Level of confidence of the above assessment

☒ Based on partial evidence

Explanation for the level of confidence indicated above.

The awareness tools mentioned in action (NBSAP A.1.a) were developed and distributed to different targeted groups through different means in different locations. For example, the Ministry of Health and Environment developed and distributed awareness publications in governorates through its directorates and departments that work locally based on the Ministry's awareness programs and other sources such as Nature Iraq (NGO) (mostly working in the Marshlands) and at regional level in the KRG. The co-ordination between these different organisations and geographically separated agents is weak and needs to operate at a more strategic level.

NBT 5: By the end of 2020, a GIS database of the extent, condition (i.e. healthy or degraded) and protection status of the natural (not altered by human intervention), semi-natural and human modified habitats of Iraq has been developed.

Progress towards the implementation of the selected target:

☒ On track to achieve target.

Date the assessment was done:

June 2018.

Explanation for the level of confidence indicated above

1. 1.53 % of the land area of Iraq is currently protected with 23 areas listed in the World Protected Area database (protectedplanet.net) but only 5 of these have been formally designated.

2. A large number of new sites have been identified through the results of survey work published in a Key Biodiversity Areas of Iraq report published in 2017. It describes the spatial location and site details for 82 priority sites for conservation and which are in need of formal protection in national law.
3. The Ministry of Health and Environment has designed a form to collect missing information about the natural, semi-natural and human modified habitats. Work is on-going through the directorates of the environment to gather more information on biodiversity and associated drivers/environment through the biodiversity survey form

Indicators used in this assessment

1. Change in number, land area covered and number of managament plans of protected areas using (https://www.protectedplanet.net/) and Biodiversity Indicators Partnership data for Iraq (http://bipdashboard.natureserve.org/).
2. Rate of loss of natural habitats, including forests, is identified and spatially mapped. (e.g. forest change cover from satellite data (http://earthenginepartners.appspot.com/science-2013-global-forest).
3. Mapping of threats (which has begun with the KBA report in 2017).
4. Species distribution maps (for the 1388 species assessed on the IUCN Red List of Threatened Species are available to download (from https://www.iucnredlist.org/about/background-history - downloaded on 23/05/2019) and these maps will be overlaid on the GIS database and this will include the (83) threatened species (those listed as critically endangered, endangered and vulnerable).
5. The protected area connectedness index data for Iraq.

Figure 3-1 below shows an indicator that assesses an important element of Aichi Target 11, i.e. the extent to which terrestrial protected areas form "well-connected systems of protected areas integrated into the wider landscape". This assessment is performed using a fine-scaled grid covering the entire terrestrial surface of the planet. Each

protected grid-cell is scored in terms of how well connected it is to other protected cells, and to cells containing primary vegetation (habitat) in the surrounding non-protected landscape. The score obtained for each protected cell ranges between 0 and 1. PARC-connectedness for any given spatial reporting unit is then derived by summing these scores across all protected cells within the unit and dividing this sum by the number of protected cells, thereby expressing overall connectedness as a proportion (also ranging between 0 and 1).

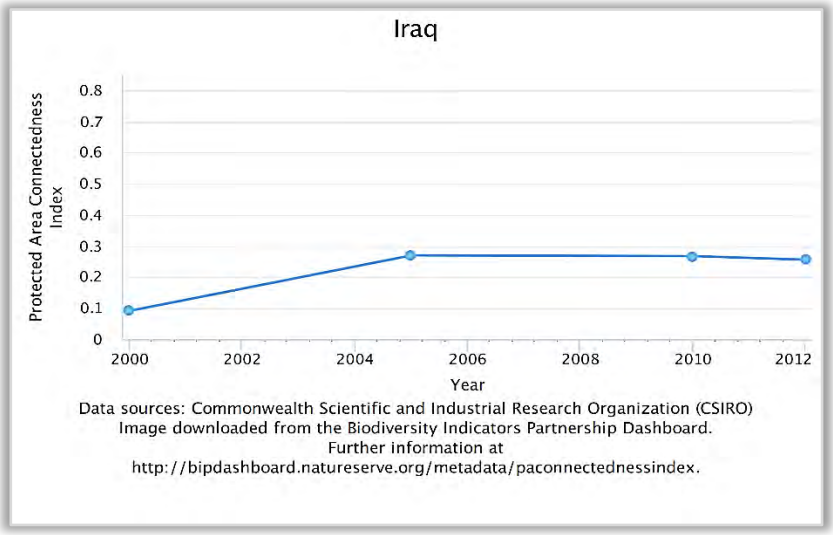


Figure 3-1 Protected area connectedness index data for Iraq. From 2000 to 2012 the index increased at a n annual rate of 9%.

For Protected Area Representativeness Index scores for Iraq, figure 3-2 below, show this index assesses an important element of Aichi Target 11 – i.e. the extent to which terrestrial protected areas are "ecologically representative". This assessment is performed at a much finer ecological and spatial resolution than that typically employed in other assessments of protected-area representativeness. The PARC-representativeness indicator is therefore intended to complement existing indicators of ecological representativeness such as Protected Area Coverage of Ecoregions

PARC-representativeness is generated using a fine-scaled grid covering the entire terrestrial surface of the planet. For each cell in this grid an estimate is derived of the proportional protection of all cells that are ecologically similar to this cell of interest. Ecological similarity between cells is predicted as a function of abiotic environmental surfaces (describing climate, terrain, and soils), scaled using generalised dissimilarity modelling to reflect observed patterns of spatial turnover in species composition, based on best-available occurrence records for plants, vertebrates and invertebrates globally. PARC-representativeness for any given spatial reporting unit is then derived as a weighted geometric mean of the scores obtained for all cells within that unit, with the contribution of each cell weighted according to its ecological uniqueness.

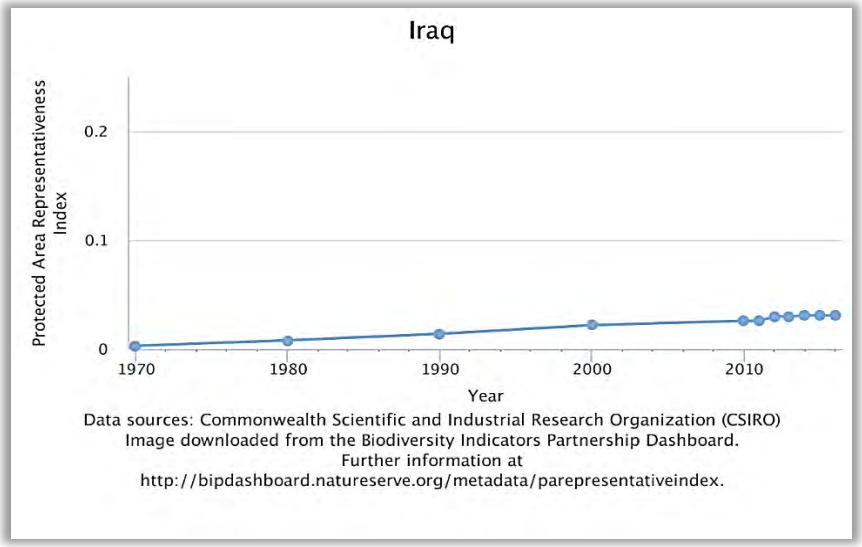


Figure 3-2 Protected area representativeness index scores for Iraq. Representativeness Index for Iraq was 0.031 in 2016. During 2000-2016, the index changed at an annual rate of 2.24%.

Level of confidence of the above assessment

☒ Based on comprehensive evidence

Explanation for the level of confidence indicated above.

- The survey data on biodiversity and the threats to it was published in Key Biodiversity Areas of Iraq report, it published spatial and site details for 82 areas prioritized for biodiversity conservation.
- MoHEnv has designed a form to collect additional information (as supplement that collected by the KBA report of 2017) about the natural, semi-natural and human modified habitats. Work is on-going through the directorates of the environment to gather more information on biodiversity and associated drivers/environment through the biodiversity survey form.
- Globally available data has been used to indicate the changing status of protected areas in Iraq.

Adequacy of monitoring information to support assessment

☒ Monitoring related to this target is adequate

The monitoring system for the target

Quarterly monitoring reports on the Ministry's survey outcomes.

NBT 6: By the end of 2020, the reasons for loss and degradation (i.e. the species that used to be present in that habitat are not there anymore, and the services that the people expected or used are reduced or absent) of each of the natural (not altered by human intervention), semi-natural and human modified habitats of Iraq have been identified to inform conservation actions

Progress towards the implementation of the selected target:

☒ On track to achieve target

Date the assessment was done:

June 2018.

Explanation for the level of confidence indicated above

Evidence in assessing this target:

- Most of data requested by this target are published in the KBA document entitled "Key Biodiversity Areas in Iraq: Priority Sites for Conservation & Protection (2017)".
- A biodiversity survey form was compiled by all environmental directories in Iraq. The purpose of the form was to record information from site surveys, including updating information on KBA sites, about the state of natural habitats and the degree of threat and pressure thereof. The assessment of the causes of loss of another habitat (semi-natural and modified by human) has not been achieved.

Indicators used in this assessment

1. Eighty-two Key Biodiversity Areas have been identified through survey work (document published in 2017) and the threats to these sites have been identified and mapped.
2. The threats to 648 species occurring in Iraq on the IUCN Red List of Threatened Species have been assessed.
3. The three commonest (identified) major categories of threat come from "Pollution", "Biological Resource Use" and "Human and Commercial Development" (see Fig1-1).

Level of confidence of the above assessment

☒ Based on comprehensive evidence

Explanation for the level of confidence indicated above.

Threats in 82 KBA sites have been identified during extensive survey work and published in the KBA report (2017). On-going (three monthly) monitoring of these sites (and additional sites) has begun in some regions (see above) but more funds are required to support the training on monitoring.

Adequacy of monitoring information to support assessment

☒ Monitoring related to this target is adequate

The monitoring system for the target

Periodic (three months) monitoring reports are underway in some regions but more funding required to support the training in other regions.

NBT 7: By the end of 2016, major pressures on forest ecosystems have been identified and studied.

Progress towards the implementation of the selected target:

☒ Progress towards target but at an insufficient rate

Date the assessment was done:

June 2018.

Explanation for the level of confidence indicated above

There are limited assessments of pressures and threats on the forest ecosystem and the target has not been achieved within the deadline (2016). However, subsequent work has noted threats to forests in Iraq refer to the measures taken to the action (A.4.d) related to this target.

Indicators used in this assessment

- Change in land use (deforestation rate).
- Current threats (in KBA document 2017) to the forest ecosystem are identified.

Level of confidence of the above assessment

☒ Based on comprehensive evidence

Explanation for the level of confidence indicated above.

- Surveyors were unable to identify and study pressures on forest ecosystems due to the deteriorating security situation in the governorates of Nineveh, Salah al-Din and Kirkuk to meet the target deadline.
- Limited technical resources to use forests remote monitoring.

Adequacy of monitoring information to support assessment

☒ Monitoring related to this target is partial.

The monitoring system for the target

- Field visits and environmental assessment reports.
- Monitoring reports for updating the database as the situation evolves, (type of forest, number and type of planted trees, security situation, actions taken).

NBT 8: By the end of 2020 legislation has been enacted to address major pressures on forest ecosystems and their local species and to promote their sustainable management, restoration and conservation.

Progress towards the implementation of the selected target:

☒ On track to achieve target

Date the assessment was done:

June 2018.

Explanation for the level of confidence indicated above

The existence of legislation in place to protect forests and identify the main pressures on the forest ecosystem and how to control them.

Indicators used in this assessment

- Number of active legislations on forest protection.
- Main pressures on forest ecosystems.

Level of confidence of the above assessment

☒ Based on comprehensive evidence

Explanation for the level of confidence indicated above.

Availability of legislation addressing pressures on forests.

Adequacy of monitoring information to support assessment

☒ Monitoring related to this target is adequate

The monitoring system for the target

Monitoring by the relevant authorities (e.g. Ministry of Agriculture in the Federal Government, Ministry of Agriculture and Water Resources in the Kurdistan Region) in evaluating the legislation through exchanging views and issuing of official letters.

NBT 9: By the end of 2020, 1,000 square km of desertified land has been restored.

Progress towards the implementation of the selected target:

☒ On track to achieve target

Date the assessment was done:

June 2018.

Explanation for the level of confidence indicated above

The commitment from the Ministry of Environment to achieve the GEF funded project entitled "Sustainable Land Management for Sustainable Livelihoods in the Degraded Areas of Iraq", with support from the implementing agency (FAO).

Indicators used in this assessment

- Area of desertified shrub land in km^2 that is restored to agricultural land/grassland.
- Number of piloted projects on dryland/ degraded agricultural lands are rehabilitated.

Level of confidence of the above assessment

☒ Based on partial evidence

Explanation for the level of confidence indicated above.

This target was classified as "based on partial evidence" because the target is wholly linked to a national project funded by one of the international funds for the environment (GEF) and the purpose of reclamation of 1000 Km^2 of the grassland/tree desert which will begin on August 2019. Thus, the implementation of the project will start soon, but regular follow-up will be used to indicate the percentage of completion and disbursement of the allocated amounts.

Adequacy of monitoring information to support assessment

☒ Monitoring related to this target is adequate

The monitoring system for the target

In the project financed by the Global Environment Fund (GEF), as well as other projects implemented by UN organizations, monitoring and evaluation is an integral part of the project (see Output 4.2.1in Project PIF). Project monitoring and evaluation systems are established and provided timely information on project's outcomes and outputs progress.

The details of the monitoring will be specified in the project document, which is via quarterly and annual reports, which show the progress of work to implement the project outputs and the agreement between the parties on the tools of the monitoring and control system.

NBT 10: By the end of 2016, a national monitoring programme is established for identification of the main sources and diffusion paths of chemical and physical pollutants in the natural ecosystems and the effects of pollution on natural ecosystems.

Progress towards the implementation of the selected target

☒ Progress towards target but at an insufficient rate

Date the assessment was done

June 2018.

Indicators used in this assessment

1. Sources of chemical and physical pollutants which have impacts on biodiversity/ecosystems are identified.
2. National Monitoring Programme (for the main sources of chemical and physical pollutants in the natural ecosystems) is established.
3. Pollution impacts assessment on biodiversity/ecosystems.
4. Reduction in the number of species on the IUCN Red List of Threatened Species that are impacted by pollution (see Fig 1-1).

Level of confidence of the above assessment.

☒ Based on comprehensive evidence

Explanation for the level of confidence indicated above.

Although there are some existing monitoring programmes on water and air quality, on the marine environment including oil pollution there is a need to have a more comprehensive monitoring program targeting all biodiversity and ecosystems in Iraq to identify the sources of pollution and their impact on ecosystems. This has not been achieved within the target deadline.

Adequacy of monitoring information to support assessment

☒ Monitoring related to this target is partial (e.g. only covering part of the target).

NBT 11: By the end of 2018 environmental standards are issued and enforced for prevention and control of priority pollutants in the natural ecosystems (not altered by human intervention).

Progress towards the implementation of the selected target

☒ Progress towards target but at an insufficient rate

Date the assessment was done

June 2018.

Indicators used in this assessment

Numbers of environmental standards for prevention and control of priority pollutants in natural ecosystems (not altered by human intervention) are issued/updated.

Level of confidence of the above assessment

☒ Based on comprehensive evidence

Explanation for the level of confidence indicated above

Although there are many pieces of legislation for protecting the environment, there is no common agreed standard to control pollutants affecting natural ecosystems (not altered by human intervention).

Adequacy of monitoring information to support assessment.

☒ No monitoring system in place.

NBT 12: By the end of 2014, legislation is issued for the establishment of protected areas in Iraq.

Progress towards the implementation of the selected target

☒ On track to achieve target

Date the assessment was done:

2015 for the assessment of legislation.

Indicators used in this assessment

The issuance of legislation for the establishment of protected areas was completed.

Level of confidence of the above assessment

☒ Based on comprehensive evidence

Explanation for the level of confidence indicated above

The level of confidence is comprehensive as the national legislation for protected areas was approved

NBT 13: By the end of 2014, at least three training workshops on protected areas management have been conducted.

Progress towards the implementation of the selected target

☒ On track to achieve target

Date the assessment was done

2016.

Explanation for the level of confidence indicated above

Evidence used came from published information of training workshops reports, photos and other supporting documents mentioned in the target related websites (see Sec II NBSAP A.5.a).

Indicators used in this assessment

Three training workshops were successfully held on management of protected areas and biodiversity in coordination with universities and civil society organizations.

Level of confidence of the above assessment

☒ Based on comprehensive evidence

Explanation for the level of confidence indicated above

The level of confidence in the evaluation was high due to the completion of the three workshops within the specified period.

Adequacy of monitoring information to support assessment.

☒ Monitoring related to this target is adequate

The monitoring system for the target

The workshop completion reports served as a monitoring tool for the achievement of the goal capacity enhancement for protected area management.

NBT 14: By the end of 2016 a study and GIS maps of the most sensitive habitats (i.e. under high level of threats and containing high numbers of globally threatened species) have been developed.

Progress towards the implementation of the selected target:

☒ On track to achieve target

Date the assessment was done:
The latest assessment of the measures of the target is 2017.

Indicators used in this assessment

1. The status of biodiversity-rich areas in sites declared as, or proposed to be designated as, protected areas in Iraq was updated.
2. The number and type of threats identified in critical biodiversity areas.
3. Number of GIS maps for sensitive habitats.

Level of confidence of the above assessment

☒ Based on comprehensive evidence

Explanation for the level of confidence indicated above

The level of confidence was based on comprehensive evidence as the results of the Biodiversity Areas Report in Iraq prepared by the Ministry of Environment and in collaboration with Nature Iraq organization, published in 2017. The work focused on the 82 key biodiversity areas from north to south Iraq which were selected based on the presence of important conserved species and highest threat levels. GIS maps for each site were designed to provide an overall impression of a site and its surrounding area, provide landscape condition and show the preliminary boundary of a specific site that could be used as a basis for later formal Protected Area designation. These maps are available to combine with other data sets to provide spatial information which can be combined with other data sets to produce a multi-criteria GIS map of Iraq (more information in action Sec II NBSAP (A.4.a).

Adequacy of monitoring information to support assessment

☒ Monitoring related to this target is adequate

The monitoring system for the target if one exists

The KBA project (report published in 2017) has a follow-up monitoring system for each site. Monitoring is provided by the project's monitoring team, which is derived from the information provided by the field survey team.

NBT 15: By the end of 2020, ten new protected areas have been gazetted and established.

Progress towards the implementation of the selected target:
☒ On track to achieve target.

Date the assessment was done:

Nov 2018.

Explanation for the level of confidence indicated above

- List of Protected Areas already designated and in the process of being designated (according to the World Protected Area database – www.protectedplanet.net).
- The list of natural reserves proposed by the National Commission for Nature Reserves, which has been submitted for official approval and announcement (see Sec II NBSAP A.3.a).

Indicators used in this assessment

Approval of the proposed 18 protected areas.

Level of confidence of the above assessment

☒ Based on comprehensive evidence

Explanation for the level of confidence indicated above

The assessment was based on comprehensive evidence as 18 protected areas were proposed through a vote of the National Commission for protected areas, Council of Ministers for approval and announcement will take some time.

Adequacy of monitoring information to support assessment

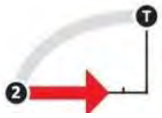
☒ Monitoring related to this target is adequate.

The monitoring system for the target

Monitoring is a following-up process which is the responsibility of the National Committee for actions taken for protected areas (such as nomination) and (formal ratification) in coordination with the legal authorities

NBT16: By the end of 2016, a national assessment is published of the state of provisioning, regulating and cultural services supplied by natural ecosystems and their importance for rural and urban people and on management options to be developed for the sustainable supply of ecosystem services.

Progress towards the implementation of the selected target



☒ No significant change

Date the assessment was June 2018.

Indicators used in this assessment

1. Eco-region services status in Iraq was assessed and published.
2. Numbers of management options for the sustainable supply of ecosystem services were developed.
3. Percentage of rural people that used and get benefit from ecosystem services.
4. Percentage of urban people that used and got benefits from ecosystem services.

Level of confidence of the above assessment

☒ Based on comprehensive evidence.

Explanation for the level of confidence indicated above.

By the end of the target implementation date, and there is no assessment of the extent or change in ecological services; only an updated list of the ecosystem services based on published literature.

Adequacy of monitoring information to support assessment.

☒ No monitoring system in place

NBT 17: By the end of 2018 a national strategy/sub-national strategy are established for the sustainable management of ecosystems to supply important ecosystem services for rural and urban people.

Progress towards the implementation of the selected target

☒ Progress towards target but at an insufficient rate

Date the assessment was done

June 2018.

Additional information

The strategy/sub strategy has not been achieved because of the obstacles mentioned in (Sec II NBSAP A.2.g), but there are procedures and legislation adopted to support the strategy in the future.

Indicators used in this assessment

1. National strategy/sub-national strategy is established.
2. Percentage of rural /urban people supported by ecosystem services taking into consideration women, local communities, the poor and vulnerable.

Level of confidence of the above assessment

☒ Based on comprehensive evidence

Explanation for the level of confidence indicated above.

Limited measures taken to establish the strategy /sub strategy for the sustainable management of ecosystems within the mentioned deadline.

Adequacy of monitoring information to support assessment

☒ Monitoring related to this target is partial (e.g. only covering part of the area or issue)

The monitoring system for the target

Periodic follow up through annual progress reports.

NBT 18: By the end of 2017 legislation is enacted to control the introduction and diffusion of non-native species into the natural environment

Progress towards the implementation of the selected target:

☒ Progress towards target but at an insufficient rate

Date the assessment was done:

2017.

Summary of evidence used

A governmental committee was established, and the legislation was drafted in 2017, but the administrative and legal procedures in the ratification and declaration of legislation by the higher authorities (necessary for the adoption of national legislation) are considered obstacles in the progress of this target.

Indicators used in this assessment

Legislation on the control of the introduction and diffusion of non-native species into the natural environment is enacted.

Level of confidence of the above assessment

☒ Based on comprehensive evidence

Explanation for the level of confidence indicated above.

The level of confidence was based on comprehensive evidence because the legislation is still in draft form and was not adopted within the target deadline of 2017 (as explained in the evidence summary mentioned above).

Adequacy of monitoring information to support assessment

☒ Monitoring related to this target is adequate

Please describe the monitoring system for the target if one exists

Monitoring the achievement of this objective is carried out by following up with the Council of Ministries, the entity that adopt the legislation.

NBT 19: By the end of 2020 the list of invasive species of Iraq and their impacts and invasion pathways have been published

Progress towards the implementation of the selected target:

☒ On track to achieve target

Date the assessment was done:

Nov 2018.

Summary of evidence

List of invasive species of Iraq was updated (in November 2018) based on scientific research, their impacts and invasion pathways will be taken into consideration for the next two years based on the availability of the needs mentioned above.

Indicators used in this assessment

List of invasive species of Iraq and their impacts and invasion pathways is published.

Level of confidence of the above assessment.

☒ Based on comprehensive evidence

Explanation for the level of confidence indicated above.

An updated list of the alien and invasive species was issued by the scientific experts in November 2018. However, species' impacts and pathways are ongoing to be achieved to meet the target deadline.

Adequacy of monitoring information to support assessment.

☒ Monitoring related to this target is partial

The monitoring system for the target if one exists

The monitoring is based on following up reports.

NBT 20: By the end of 2020 the list of threatened species of Iraq has been published and an action plan for the conservation of priority species is produced.

Progress towards the implementation of the selected target:

☒ On track to achieve target

Date the assessment was done:

July 2017.

Summary of evidence used

National Target 20 has focused on establishing a list of national threatened species and action plans for the conservation of these priority species. The two main measures taken to implement (NBSAP A.3.b) related to this target are: (1) policy and legislation; and (ii) programmes and initiatives.

Significant measures have been undertaken to implement (NBSAP A.3.b) by adopting programmes and initiatives through four main fields/perspectives related to threatened species between 2014 and 2020:

1. National committee was established in 2017, list of threatened species with conservation action plans was drafted, which will be adopted in due course. This is considered partial evidence of this part of the target.
2. The document (KBAs in Iraq) was published in 2017 using IUCN criteria for Red List status to prioritize key biodiversity areas in Iraq. Mapping of high priority areas is a pre-requisite for protected area networks and this report represents a major step towards implementing an evidence-based network of protected sites.
3. Eighteen potential PAs are nominated by national PAs committee, two of them (Alteeb and Aldelmaj) were supported financially by a GEF funded project, this measure is positively enhanced the threatened species conservation.
4. Ecotourism regulations in marshland were drafted by a national committee; the regulation takes into consideration the impact on threatened species.
5. Shortage of expertise on climate change modelling, restricted the evaluation of climate change impacts on threatened species, which is considered one of the main threats on biodiversity in Iraq.

There is much to do to complete the partial progress mentioned above by 2020.

Indicators used in this assessment

1- A list of threatened species is established by a national committee.
2- An action plan for those species' conservation is produced.
3- A list of threatened species has been drafted.
4- Number of academic publications concerning threatened species in Iraq are published.

Level of confidence of the above assessment

☒ Based on comprehensive evidence.

Explanation for the level of confidence indicated above.

Availability of sufficient information and studies used to evaluate the measures undertaken above was assessed to consider the level of confidence "based on comprehensive evidence"

Adequacy of monitoring information to support assessment

☒ Monitoring related to this target is adequate.

The monitoring system for the target

At an international level there is a monitoring programme for biodiversity which can be used to indicate change in biodiversity status (see Figure 3-3).

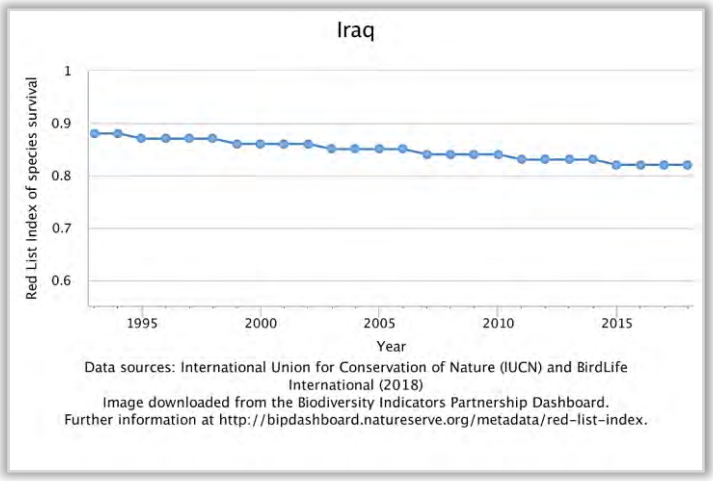


Figure 3-3. The Red List Index of species survival for Iraq, weighted by the fraction of each species' distribution occurring within the country.

The index varies from 1 if the country has contributed the minimum it can to the global Red List Index (i.e. if all species in the country are classified as Least Concern –(see Sec IV /ABT12) for categories of extinction risk of which "Least Concern" is the least likely to be become extinct) to 0 if the country has contributed the maximum it can to the global Red List Index (i.e., if all species in the country are classified as Extinct or Possibly Extinct). A downwards trend indicates declining aggregate survival probability of the country's species. The index is based on all mammals, birds, amphibians, reef-building corals and cycads native to the country (noting that not all countries support species in all these groups). During 1993-2018, the Red List Index changed at an annual rate equating to -0.28%. Therefore, generally biodiversity is declining in Iraq.

However, there is no specific monitoring system of counts of each species undertaken on a regular basis across the whole of Iraq (the IUCN Red List Index is based on changes in extinction risk category which, for Iraq, is based on expert opinion and sporadic studies). However, the Iraqi Ministry of Health and Environment is the focal point for monitoring progress of the national list of threatened species of Fauna and Flora in cooperation with other ministries, environmental institutes and NGOs. The information used to explore change in biodiversity is derived mainly from scientific article/researches and snapshot survey results. Bi-annual review of available data described as the number of observed species, total numbers of species, abundance/relative abundance, occurrence and changes in red list status for species scored are all potential ways to monitor biodiversity in Iraq.

In addition, timeline of the national target 20 is from 2017 to 2020 which means that two years are left to finalize the planed actions of this target.

NBT 21: By 2020 legislation for the conservation of threatened species is issued and enforced

Progress towards the implementation of the selected target

☒ On track to achieve target

Date the assessment was done

June 2018.

Summary of evidence used

- Adopting national target 21 in the NBSAP has encouraged the government to strongly support two important pieces of legislation that focus directly on the protection of threatened species.

- Drafting Instructions on (Protection of Endangered Animal and Plant Species in Natural Environment) in 2018, (see Sec II NBSAP action A.2.f).
- Drafting a regulation on ecotourism in the Mesopotamian Marshes (the first site designated as a Protected area) in 2018 (see Sec II NBSAP action A.3.b).

Despite the good efforts invested in developing legislation of the threatened species in Iraq the documents are still in draft form and more work is required to legally issue and enforce this legislation.

Indicators used in this assessment

1. Legislation for the protection of threatened species is drafted.
2. Legislation for the protection of threatened species has been adopted.

Level of confidence of the above assessment

☒ Based on comprehensive evidence.

Explanation for the level of confidence indicated above.

A national committee for the threatened species was formed by the focal point ministry in order to review and update the current protection legislation in Iraq. A new draft of the protection legislation was produced by the committee in 2018. The draft of the protection legislation submitted to the Iraqi Council of Ministers for ratification before 2020.

Adequacy of monitoring information to support assessment

☒ No monitoring system in place

The monitoring system for the target

There is no a specific monitoring system for the implementation of threatened species protection policies and legislation in Iraq. However, the Iraqi Ministry of Health and Environment is the focal point ministry taking the lead for monitoring the progress of the national list of threatened species of Fauna and Flora and following up with the legal authorities in GOI on adoption of this legislation.

NBT 22: By the end of 2020, a survey of indigenous and local communities' traditional knowledge, use and practices relevant for the conservation and sustainable use of biodiversity is published.

Progress towards the implementation of the selected target:

☒ Progress towards target but at an insufficient rate

Date the assessment was done:

May 2018.

Summary of evidence used

The evidence used to evaluate this target was based on information provided by five reports compiled by the environmental directories in the five Iraqi Provinces (Basra, Mayssan, Thi-Qar, Ninewah and Kirkuk) (see NBSAP action A.1.g and A.1.h). It was considered as the first step to achieve this target and could be the baseline to conduct the surveys; there are still two years to conduct surveys for indigenous and local communities' traditional knowledge in Iraqi governorates.

Indicators used in this assessment

Survey of indigenous and local communities' traditional knowledge use and practices relevant for the conservation and sustainable use of biodiversity is published.

Level of confidence of the above assessment

☒ Based on comprehensive evidence

Explanation for the level of confidence indicated above.

The level of confidences used to evaluate this target is based on comprehensive evidence, as the comprehensive surveys are not achieved, only number of reports and one survey on three Governorates in marshlands. There is a shortage of information concerning traditional knowledge of other parts of Iraq mainly in western and eastern parts of Iraq along with other ethnic groups such as Yezidis (in Sinjar areas in north-western Iraq).

Adequacy of monitoring information to support assessment

☒ No monitoring system in place

NBT 23: By 2016 a Resource Mobilization Plan for implementation of the NBSAP is established and implemented.

Progress towards the implementation of the selected target:

☒ No significant change

Date the assessment was done:
2018.
Indicators used in this assessment
Resource Mobilization Plan for implementation of the NBSAP is established and implemented.

Level of confidence of the above assessment
☒ Based on comprehensive evidence

Explanation for the level of confidence indicated above.

Although resource mobilization strategy (2015-2020) exist and published in *http://www.biodiv.be/iraq.*

However, there are no measures undertaken to set implementation plans because there is limited national expertise to draft them.

Adequacy of monitoring information to support assessment

☒No monitoring system in place

Section IV. Description of the National Contribution to the Achievement of Each Global Aichi Biodiversity Target

ABT 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably. Addressing the direct and underlying drivers of biodiversity loss will ultimately require behavioral changes by individuals, organizations and governments

Description of extent of contribution to the achievement of the ABTs with the evidence used

Initiatives aimed to increasing awareness of the importance of nature among the population took place across the country targeting many people. Surveys were undertaken to evaluate knowledge on biodiversity at local levels (in both urban and rural areas), among decisions makers and planners, as well as governmental employees in different positions. Results showed different rates of participation based on sex-disaggregated data (male and female) and the difference in knowledge levels about specific areas of biodiversity (Knowledge, Attitudes and Practices of the Community Survey). Five hundred and fifty two participants from rural and urban people were involved, the results showed lower rates of (self-reported) understanding about the concept of Biodiversity (7% , 13%) respectively, (8% female and 14% male participation) (for further details see NBSAP action A.1.c).

Other on-going survey by the Natural Resources department in the MoHEnv targeted a number of groups (highly-educated students and Governments employees). A comprehensive list of 15 questions was distributed amongst all governorates. Two examples are shown in NBSAP action A.1.f (from a University and another from a Ministry): both are good examples of identifying gaps in specific biodiversity areas that need to be strengthened.

Various communication and awareness tools have been used among different sectors of society, such as (TV programs) on satellite channels and TV interviews such as the weekly TV program (Environment and Life) and (Agriculture Irshad). The official website of MoHEnv held several direct meetings with residents of the marshes about the importance of ecosystem services, and also organized several seminars and workshops targeted different governmental agencies on the importance of establishing nature reserves and their role in protecting Endangered species.

Social media activities and websites are used by NGOs like NI and IGCO but there is no locally defined, area based or targeted awareness programs (see NBSAP action A.1.a). Most of the efforts spent did not reach the targets planned in the NBSAP. The main challenges were the security conditions in many areas in Iraq with difficulties in reaching the communities, in addition to that a lack of financial resources were allocated to awareness programs (such as achieving campaigns, organizing workshops and forums, design and advertise TV videos, printing and publishing awareness materials). More coordination and cooperation between all related stakeholders are needed to achieve a comprehensive awareness plan based on the preassessment of the outcomes of surveys on the different sectors of communities and local people (like farmers, fisheries, indigenous people etc.) to find the gaps in knowledge. An assessment is also needed that targets youth and children in order to find out the effectiveness of education materials used in schools, assess the knowledge of local communities about ecosystem service values and their roles in conserving biodiversity and the linkages with economy and livelihoods: these considerations will be taken into consideration in the updated NBSAP.

Websites

- *http://www.moen.gov.iq/* *المركز الوطني لبرنامج حياة والحياة*
- *http://www.natureiraq.org*
- *https://www.facebook.com//IraqiWildlifeCenter*

ABT 2: By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems

Description of extent of contribution to the achievement of the ABTs with the evidence used

Ecosystem services for the major regions in Iraq have been identified and these services have been reviewed in (Sec II NBSAP Action A.2.g) although the local currency value of these services has not been calculated to determine the extent to which local communities will benefit from these values, they are, however, included in the National laws, strategies and regulations that will protect ecosystems as mentioned below.

1. **Poverty reduction strategy in Iraq (2018-2022***):*

Ecotourism is included in this strategy, efforts have been made to strengthen sustainable tourism to simultaneously stimulate economic activity (e.g. jobs) and conserve the biological diversity.

This strategy in (outcome1/activity1) has encouraged youth graduates from agricultural and veterinary institutes and colleges to establish agricultural projects. In addition, companies will ensure jobs in the countryside and benefit from the natural eecosystem services, it is supported by the Iraqi central bank loans initiatives and Social Fund for Development.

2. **The National Environmental Strategy and Action Plan for Iraq (2013-2017)**

The strategy includes several actions aimed at reducing degradation of land, forests, marshland, conserving natural vegetation, preserving biodiversity and marine environment, and other programs on biosafety and ecotourism: all actions contribute to conserve biodiversity and develop ecosystem services.

3. **Ministry of agriculture strategic plan (2015-20125)**

The strategy aims to achieve food security from the local products, which seeks the development of agricultural sector to reach the highest possible levels of self-sufficiency of agricultural products to achieve sustainable food security and environmental protection.

4. **National Development Plan (2018-2022)**

The plan aims to build a prosperous and diversified economy, considering agriculture is an economic sector that contribute in GDP, increase plant and animal agricultural production coverage for Iraq's food basket (food security).

5. **Integrated National Energy Strategy (INES)**

The Strategy identify the Environmental Impact of the Energy Sector considering the greater amount of production and resource consumption of energy sector, the greater is the stress imposed on air, land, and water that have impact on Biodiversity.

6. **The strategy of water and land management in Iraq (SWLRI 2015-2035)**

Iraq suffer from a steady decline in its ability to meet its water needs. By as early as 2020, there will be a decline in the fresh water quantity with good quality to meet its development needs. This alarming trajectory can be averted only with major reform of water usage and allocation, and fully resolved only by reaching an agreement with Iraq's upstream riparian neighbors. The Strategy for Water and Land Resources of Iraq 2015 to 2035, provides the building blocks for needed reform and the data and analytical tools necessary to negotiate, adapt, and plan.

Although there are services provided by natural systems in Iraq, particularly in northern Iraq, for example, the forests of the Kurdistan Region, the marshes in southern Iraq and their services to the local population and their livestock. However, there are no studies (yet) in Iraq showing the economic feasibility of natural systems and the financial value in monetary terms they provide to the local community, and there are no explicit plans for the sustainability of those services. An analysis of nearly 170 international inland wetlands indicates that the ecosystem services provided by those wetlands have an annual value ranging from $5,500 per hectare to approximately $110,000 per hectare. The average unit value of the surveyed inland wetlands within the (*de Groot et al.)* study (2012) is $28,000 per hectare per year. Applying this unit value indicates that the value of Iraq's marshes is over $7.7 billion.

In this report, specifically in (NBSAP action A.4.f) on Ecosystem services, there is a case study on the (Evaluation of the Ecosystem Services of the Central Marsh in Southern Iraq) that focused on the services values provided by this ecosystemincluding trading of: fish; harvested plants; water buffalo milk; and fodder. Data were collected across six months in 2014 for an area of 40,000 hectares to have a total value of 860,078.23 USD *(Fazaa et al. 2018).*

Websites:

- *NESAP (2013-2017).pdf*
  http://www.moen.gov.iq /6NR /strategies and Plans
- *National Development Plan (2018-2022).pdf*
  https://mop.gov.iq/en/page/view/details?id=88
- *Poverty reduction strategy in Iraq (2018-2022).pdf (in Arabic)*
  https://mop.gov.iq/en/static/uploads/1/pdf
- *https://www.iasj.net/iasj?func=article&aId=153109*
- *http://documents.worldbank.org/curated/en/406941467995791680/Integrated-National-Energy-Strategy-INES-final-report*

ABT 3: By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio-economic conditions.

Description of extent of contribution to the achievement of the ABTs with the evidence used

The Ministry of Agriculture provides loans and financial facilities for farmers and fish breeders using closed (aquaculture) systems, including financial facilities for the purchase of agricultural equipment, fertilizers and pesticides contributing to the increase and improvement of production and land reclamation, in addition to support fish farmers with fodder and fingerlings. Examples of funds and loans created by Agriculture bank /Ministry of finance under the control of Iraqi central bank are: (i) Fund on granting loans to farmers for agriculture projects establishment (50 million IQD each project); (ii) Funds for livestock development (poultry breeding), fish breeding by closed system (6.8 million IQD for one cage); (iii) funds granting loans for palm development to establish Palm projects (each 50 million IQD) like palm orchard, date stores; (iv) funds for granting loan to purchase agriculture equipment.

The law on agriculture lands Lease No. 24 of 2013 allowed the graduates from Agricultural and Veterinary colleges to lease agricultural land with an area not exceeding 50 acres for the establishment of agricultural projects.

The beneficiaries from these leases are exempted from rent for the first two years and will have a right to dispose of the land after ten years.
The Iraqi Central Bank launched an initiative for agricultural loans, aimed at strengthening opportunities to implement this important activity, which can provide income-generating jobs and sustainable development in rural areas (refer to the strategy of poverty combat (2018-2022)
There are many laws and regulations in force (related to the environment and endangered species) which impose penalties on those who violate these legislations. Examples include: the law of the protection and improvement of the environment No. 27 of 2009; the law of protection of wild animals No. 17 of 2010, instructions to prevent fishing for endangered species No. 2 of 2017; and the Forest and trees Law No. 30 of 2009. These funds are sources of the Environment Fund that used to award any activity that leads to environmental protection.
The same methodology used in KRG region in Iraq, the following legislation were enacted: Law No.8 of 2008 of Environmental Protection and Improvement, Law of Forests No. 10 of 2012, Law of natural Pastures No.2 of 1983, Law on Protection of wild animals and birds No.21 of 1979 including penalties imposing.

websites

- *Environmental Protection and Improvement Act No. 27 of 2009.*
- *Wildlife Protection Act No. 17 for 2010.*
- *Instructions for the Prevention of Fishing for Endangered Species No. 2 for 2017*
- *Law of forests and trees No. 30 for 2009.*
- *KRG legislation*

http://www.moen.gov.iq /6NR/legislation

- *http://www.iraq-lg-law.org/en/node/2504*
- *http://agbank.gov.iq/ar/node/484*

ABT 4: By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption (SPC) and have kept the impacts of use of natural resources well within safe ecological limits.

Description of extent of contribution to the achievement of the ABTs with the evidence used

In spite of recent economic difficulties, particularly in 2014 and 2015, and the subsequent liberation of the territories occupied by ISIS and associated reconstruction of affected areas, the Iraqi economy was able to achieve an acceptable average economic growth rate of 6.6% during the period 2010-2015 driven mainly by the continued oil production and export. The growth rate was 6.3% in 2015 and 2016 according to preliminary data and set at 7% (7.5% for the oil sector and 6.1% for all other non-oil activities: commodity, distribution and services) (NDP 2018-2022).

The GDP contribution to the agricultural sector dropped from 4.2 % (in 2013) to 3.1% (in 2016). The (NDP) (2018-2022) adopted a model which aims to increase the GDP contribution of agriculture to an estimated rate of 8.4%. This rate will depend on the availability of suitable infrastructure and investment from both public and private sectors. The plan recognizes a number of challenges posing threats to agricultural development in Iraq and its projected future progress, among these is the decrease in local agricultural production, limited capital investment in agriculture, heavy reliance on imports, environmental degradation and climate change, irrigation wastewater and outdated laws and legislation.

The main MoA strategic goal is to achieve food security. The ministry has adopted the strategic plan and set its priorities within the plant production activity focusing mainly on wheat and barley that account for one-third of national cereal production, but also including rice, dates, cotton, vegetables, fruits, legumes and alfalfa. Livestock

production has been an important pillar of Iraq's agriculture sector, representing one-third of the total value of agricultural production. Cattle, goats and sheep are the main livestock in Iraq, supplying meat, wool, milk and skins.

In the Strategic plan of MoA for the years 2015-2025, the aim is to increase production of wheat and barley for 2018 by 40% (compared with 2013) and is expected to double the production by 2025. The target is to increase the production of dates by 20% from 2013-2018 with an ultimate aim of doubling production by 2025. The aims for animal and fish production is to increase rates between 2-6% per annum. The methods to achieve these increases are through adoption of new technologies such as the use of modern irrigation, development of production inputs, provision of enhanced services, development of agricultural storage and processing, expansion of areas based on the progress in combating desertification (fixation of sand dunes) and development of vegetation cover. There is also planned adoption of self-development of ruminants by artificial insemination, integration of production cycles for poultry and taking measures to reduce production losses Agricultural (plant and animal).

(*source: Ministry of Agriculture strategic plan 2015-2025).*

Iraq is committed to developing aquaculture in a sustainable manner that protects marine ecosystems and conserves wild fish populations, with the goal of 84,000 tons from fish production by 2022 (*NDP 2018-2022*), Surface water is considered a key resource in Iraq, its quantities differ from season to season, from year to year depending on the water from outside of Iraq (i.e. upstream) and precipitation entering the two major river (Tigris and Euphrates) basins.

The agriculure sector cosumes 85% of water in Iraq, while the industrial and environmental sectors only uses around 6% each and the domestic sector just 3% (see Fig 4-1 below). There is an increasing mindset to use the sustinable irrigation technology, use crops with high resistance to salinity and drought, and to develop the irrigation infrastructures, drainage systems.

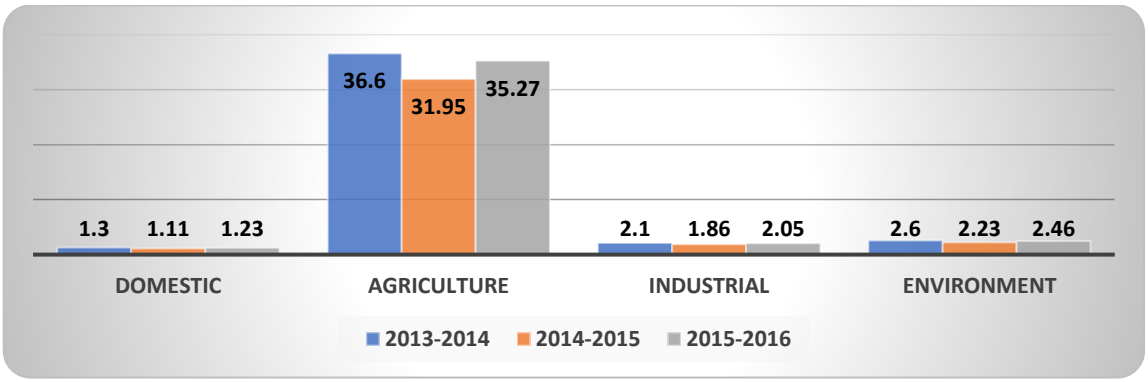


Fig 4-1 Annual use or surface water withdrawal based on kind of use (in Billion m^3/year),

A comparision of surface water withdrawel to cover the above facilities with periods of time shown in Table 4-1.

Table 4-1 rate of water withdrawal from surface water for three periods.

Years	Imported surface water quantities (Billion M^3)	Water withdrawal from surface water (billion M^3)	Rate of withdrawal
2013-2014	37.25	42.81	114.9%*
2014-2015	35.34	37.15	105.1%*
2015-2016	54.75	41.01	74.9%

**withdrawal water is larger than received surface water because of water stocks in lakes and rivers inside Iraq.*

(Source: MoP /Environmental statistic /Report on Priority development and Environmental indicators in Iraq 2016)

The estimated population in Iraq in 2018 is 38,124.2 Million with population growth rate estimated at 2.5% per annum. The actual water supply production is (8, 425, 715M^3/day), and the demand is (10, 243, 361M^3/day), there is a marked disparity among the provinces in terms of meeting their need for potable water. Water supply faced an average **deficit** in demand coverage by 18%, which is due to a shortfall or obsolescence of water projects and the old networks that require replacement with wastewater in networks; in addition, there are major impacts from wars and conflicts on the infrastructure needed for water management. The national plan ensures drinking water according to international standards which will achieve per capita consumption commensurate with population growth (at least 250 l/d in Baghdad and 200 l/d in other governorates). The aim is to achieve this through improved water quality from rehabilitation of production facilities and achieving a special awareness program targeting the population on the optimal use of water management to reduce water losses.
(source: NDP 2018-2022)

websites

- *Priority development and Environmental indicators in Iraq 2016.pdf*

http://www.moen.gov.iq /6NR/Reports and studies

- *https://mop.gov.iq/en/page/view/details?id=88*
- *https://reliefweb.int/sites/reliefweb.int/files/resources/CA1511EN.*
- *http://www.fao.org/3/ca1511en/CA1511EN.pdf*

ABT 5: By 2020, the rate of loss of all-natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

Description of extent of contribution to the achievement of the ABTs with the evidence used

The highest rates of loss of natural ecosystem are: forests in Kurdistan, forest in Kirkuk and Mosul, palm forests in central and southern Iraq, and wetlands (marshes) although the re-flooding of the Iraqi Marshes from 2003 onwards is a major past success in reclaim high quality natural habitats in Iraq.

Iraq has taken measures to reduce the rate of loss of forests and habitats through activation of the Forestry and Trees Law No. 30 of 2009 and ensuring compliance with this legislation (e.g. to prevent cutting of trees), and enforcement of Forest Law in the Kurdistan Region - Iraq No. 10 of 2012. However, there is no measure to calculate the reduction of the rate of loss.

Declines in some areas (from satellite data) of canopy cover (from 1982-2016) is shown (see Sec 1 Fig 2-4), but unclear when during this time period the decline occurred. The latter could be used to investigate changes going forward.

The mentioned laws identified numbers of deforestation drivers like:

1. Utilization of forests for planting or renting of land.
2. Cutting trees and shrubs.
3. Building infrastructure (e.g. dam) that changes the route of any water resources inside the forest.
4. Construction of quarries.
5. Livestock grazing especially in protected areas.

The pressures experienced on the forest areas as follows:

1. Infrastructures and agriculture projects on forests areas.
2. Destructive logging practices and unsustainable fuelwood.
3. Increased fire incidence and intensity.
4. Forests damage due to Military operations (in Ninewa and Salahldin Governorates).
5. Poor Forests management and protection associated with lack of financial resources.

There are several drivers of habitat fragmentation in Iraq, for example: (i) increased 'human developments' is the second most frequently cited factor associated with threats to species occurring in Iraq listed by the IUCN Red List of Threatened Species (accessed December 2018); (ii) climate change is increasing average temperatures which has resulted (in combination with upstream dams) in reducing water levels in the Iraqi Marshland, and considered one of the reason in Forests Fires in KRG.

Habitat degradation rate is increasing although measures on policies were taken to reduce the degradation rate such as:

- Environment Law No.27 of 2009 engaged MoI to establish Environmental Police to enforce the law against the offenders in order to reduce excess (Damage and Loss) of the ecosystems.
- Law of Forests in KRG, No 10 of 2012**,** to maintain stability, natural balance, manage and organize the forests, improve the environment; reduce impact of climate changes, maintain the biological diversity and encourage agricultural and tourism investments.
- Regulations No 9 of 2011 on establishment of Natural Reserves in the KRG, to preserve the environmental resources represented by biological diversity and flora/fauna., encourage the scientific researches and tourism
- Declaration of Protected Areas (five so far legally protected, 18 more in the process of designation and 82 potential sites identified through the Key Biodiversity Area assessment (2017).
- The Iraqi Marshes were included in the World Heritage List in July 2016 (in order to preserve this unique ecosystem).
- Preparation the ecotourism regulations on 2018 in natural sites and World Heritage properties, to control and prevent random access to all areas through ecotourism activities and therefore protect key vulnerable biodiversity from human disturbance.
- Regulations No.2 of 2017 to prevent overfishing in World Heritage sites
- Iraq's ratified to the Convention on the Regulation of International Trade in Endangered Species (CITES) on 2016.

Actions should be taken to reduce habitat degradation and fragmentation:

- Educating the local population about sustainability of their natural resources.
- Formal designation of protected areas.
- Identification of major threats affecting habitats (in order to reduce them) and proposal of action plans to reduce threats.
- Assessment of the effectiveness of law enforcement.

The most important economic, demographic and social pressures that lead to habitat conversion:

Threats to species

Although species are not the same as habitats, this information is relevant to this issue. There are 682 species that occur in Iraq that have had the threats associated with their probability of extinction risk assessed (https://www.iucnredlist.org) The top ten threats in terms of those associated with most species (no of species associated with threat given in parentheses – note each species can be linked to more than one threat): Biological resource use (449); pollution (292); Residential and commercial development (248); Climate change and severe weather (242); Invasive and other problematic species, genes and diseases (202); Human intrusions and disturbance (199); Agriculture and aquaculture (198); 8/ Transportation and service corridors (165); 9/ Natural system modifications (143); Energy production and mining (57).

Threats to habitats

- Agricultural expansion.
- Residential and commercial development.
- Energy production and mining.
- Excessive exploitation (cutting trees, hunting, overfishing, etc.)
- Interference and human inconvenience.
- Changes in natural systems (dams or water management, withdrawal of groundwater, digging channels, etc.).
- Alien species and threats to the environment.
- Climate change, harsh weather, drought

websites

- *Forestry and Trees Law No. 30 of 2009.pdf*
- *Regulation No. 2 of 2018 to prevent overfishing in the Marshland*

- *Environmental Law 27 of 2009*
- *Regulations for ecotourism in the natural sites and World Heritage properties of 2018(Draft)*
- *Protected Area Law No. 2 of 2014*
- *KRG legislation.pdf*

http://www.moen.gov.iq /6NR/legislation

- *KBA report,2017*

https://www.amazon.com/Key-Biodiversity-Areas-Iraq-Nature/dp/0988651467 -

ABT 6: By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem-based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

Description of extent of contribution to the achievement of the ABTs with the evidence used

Aquaculture in Iraq depends on the availability of suitable water, as well as good soil. The Tigris and Euphrates Rivers, including the country's tributaries, marshes, dams and reservoirs, are the main water sources in Iraq.
Iraq also has a limited coastline of approximately 59 kilometres, adjacent to the Gulf region, with a water area of about 700 square kilometres.
The total fishery production in Iraq mentioned in the figures below

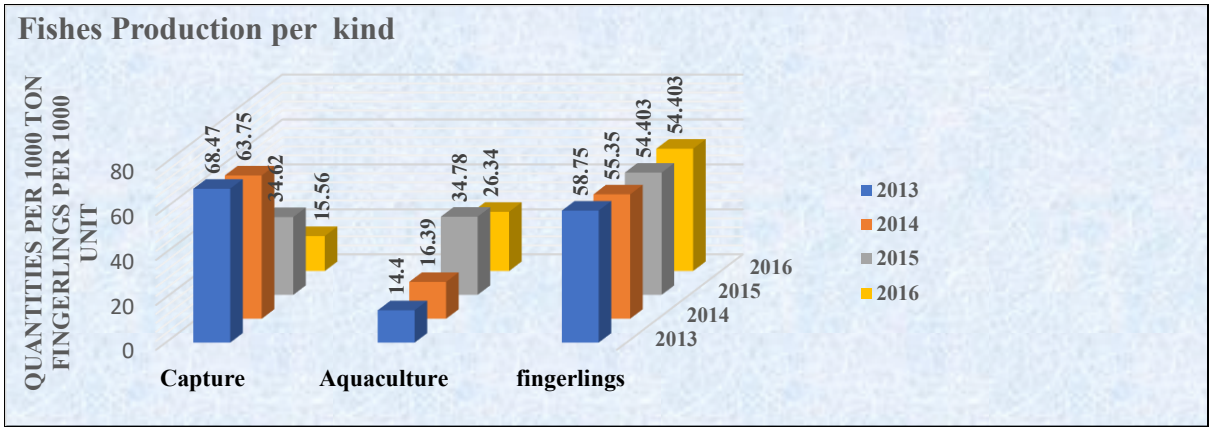


Fig 4-2 Fish (wild-caught or from aquaculture, and fingerlings) production in Iraq from 2013-2016.

Production from aquaculture was higher than from wild-caught fish in 2015 and 2016 demonstrating the Iraqi population started to depend on aquaculture in the consumption, so reducing the impact of the threat on the wild - caught fish.

(Source: AOAD,2017)
http://www.aoad.org/FYB11/fishbook10Cont.htm

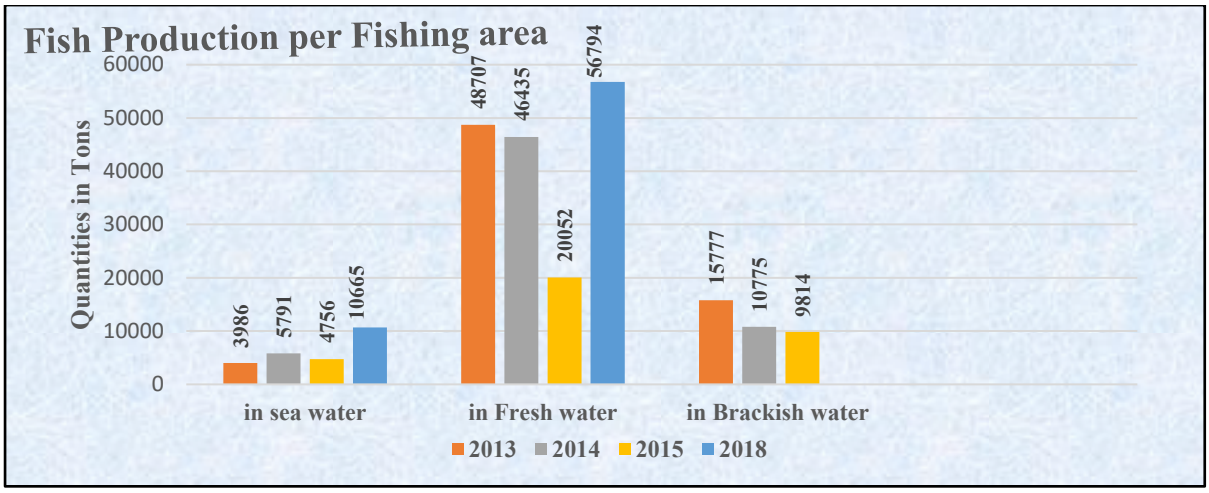


Fig 4-3 The Use of fresh water as a source for wild-caught fish production in Iraq compared with other sources
Source: (AOAD,2017) http://www.aoad.org/FYB11/fishbook10Cont.htm
(MoA/ Animal Resources directorate)

Both fresh water and sea fish production in 2018 has increased compared with previous years. Despite the availability of water resources, the production of freshwater aquaculture is mainly limited to the production of breeding common carp (Cyprinus carpio carpio). There are also limited amounts of herb (grass) carp (Ctenopharyngodon idellus) and silver carp (Hypophthalmichthys molitrix).
The aquaculture sector in Iraq witnessed a notable increase following the issuance of regulatory controls under the legal framework for the development of the fish farming sector on the Tigris, Euphrates, Marshlands and other water bodies using the floating cages system as well as the closed fish system. The aim of this sector is to meet the local market demand for fish meat and to reduce the pressure of fishing in Iraq, in addition, to protect populations of fish species from being depleted, legislation has been developed-for the protection of threatened species in the areas of the Marshlands: the regulations No. 2 for 2017 to regulate fishing in the marshes and exploitation of aquatic and protection Law No. 48 of 1976 on the conservation and organizing of fishing in Iraq.

Law No. 48 of 1976 on the Regulation of Fishing and Aquaculture and its Protection aims to regulate the utilization and protection of the aquatic environment, specifically to: improve the nutrition of humans and enhance the national economy; the law forbidding using the illegal practises in hunting; refer to the forbidden hunting areas and seasons; encourage establishment of fish breeding in closed and open system based on special regulations of the law focused on fishing in internal and territorial waters; including aquatic manufacturing and marketing, based on this law two regulations related to fish breeding were issued on fish breeding using water closed system which is under control from agriculture, water and environmental authorities, the regulations binds the owner of projects to predefined production capacity, water resources quantity, preventing any use of introduced species or using any vaccine or medicines for treatment, and also any disposal of dead /damaged fish to the Environment.
Regulation on fish breeding in floated cages that enforce the owner of such activity on the special requirements on the locations of the cages related to waterside, fish breeding requirements from food and treatment medicines that will have no impact on the water resources quality.

Regulation No 2 of 2017 on fishing in the marshes and exploitation of aquatic related to this specific key biodiversity area; it was designed to preserve biodiversity and protect threatened species from extinction.
MoA annually issues a fishing ban statement based on the provisions of the Law on the Regulation of Fishing and Aquaculture and its Protection No. 48 of 1976 in order to preserve the fish stocks and develop the fish resources where fishing is prohibited for certain seasons in the internal areas of Iraq (marshes, rivers, lakes), and marketed for the period from 15/Feb to 1/July divided into three time periods in southern, central and northern Iraq with the exception of marine fish and fish farms.
For the threatened fish species in Iraq (see Aichi Target 12)

websites

- *Regulations No. 2 of 2017 to regulate fishing in the marshes.pdf*
- *Regulation on organization and exploitation of aquatic and protection No. 48 of 1976.pdf*
- *Regulation on fish breeding using closed system*
- *Regulation on Fish breeding using floated cages*

http://www.moen.gov.iq /6NR/legislation

ATB 7: By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

Description of extent of contribution to the achievement of the ABTs with the evidence used

Iraqi contribution to this target with respect to agriculture is reflected in these actions:

A- MoA strategic objective is to achieve food security via supply from local sources, seeking to develop the state of the agricultural sector to reach the highest possible level of self-sufficiency of agricultural products to achieve sustainable food security and environmental protection.

B- In order to achieve this objective, modern technologies have been adopted, agricultural production has focussed on reducing losses and steps taken to encourage uptake of technology such as the use of modern irrigation and mechanization technologies, the horizontal expansion was based on the addition of new areas through the results of combating desertification from fixing of sand dunes and development of vegetation cover and harvesting of water.

C- Regarding the agricultural area, for example, area for wheat and barley production using irrigation is affected by variation in precipitation during the planting season. This will be expected to increase due to the spread of irrigation technologies by exploiting underground water (*Reference: MoA strategic plan 2015-2025).*

D- Iraqi aquaculture industry is increasingly important to the national economy. Iraq is committed to developing aquaculture in a sustainable manner that protects the marine ecosystem and conserves wild fish populations (see Aichi Target 4) both of which can, with suitable management, sustainably increase fish production.

E- An increase of (1.5%) in the area of fish farming from (14,628m^2) in 2013 to (21,867m^2) in 2018, and a slight increase in the volume of fish breeding cages from (194,006 m^3) in 2016 to (207,289 m^3) in 2018 (*Source: MoA/animal resources directorate*). This is to reduce the impact on wild - caught fish and to secure food safety and to encourage food factories and create job opportunities. New regulations were introduced on fish breeding (aquaculture) using floating cages in the water bodies. This legislation identifies specification of the cage area and locations to avoid/minimize sources of pollution affecting the surrounding environment.

F- Other regulation on fish breeding recommends the use of closed ponds; this legislation identifies the permission to set up fish farming projects in reclaimed or uncultivable land**.** with adequate water supply and with proper specifications to avoid any source of fish pollution or adverse impacts on the surrounding area.

G- There is no information available about forestry.

websites

- *Arab fishery statistic year book 2014/AOAD*

http://www.moen.gov.iq /6NR/studies and report

- *http://www.aoad.org/*
- *The Fishing regulations in the Marshlands No. 2 of 2017. (In Arabic).pdf.*
- *Regulation on fish breeding using closed system*
- *Regulation on Fish breeding using floated cages*

http://www.moen.gov.iq /6NR/legislation

ABT 8: By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

Description of extent of contribution to the achievement of the ABTs with the evidence used

Sec I /NBT10 identified sources of pollution in Iraq that have impacts on the environment and biodiversity, and the measures taken to control them. The monitoring programs used in Iraq were identified in Sec II NBSAP / A.4.e, water resources quality with excess of phosphorous concentrations was mentioned in some location, concentrations of SO_2 and NO_2 in the ambient air of Baghdad city through air quality monitoring program were identified.

Most ecosystems have undergone major changes in freshwater systems and the marine coastal environment through the waste produced from service industries and agricultural activities, for example sewage water, agricultural drainage water with high percentages of fertilizers and pesticides which affects the quality of water resources which results in high levels of eutrophication in polluted areas. Salinization is a problem for agriculture in dryland environments.

In Iraq several measures taken to reduce environmental pollution sources are:

1. Establishment of monitoring programs regularly sampling air and water quality across Iraq.
2. Establishment and application of environmental standards and guidelines.
3. Coordination with stakeholders at national and local levels.
4. Establishment of legislation for environmental protection and enforce the laws against violators in coordination of concerned authorities.
5. Preparation of environmental impact assessment studies when establishing any development projects.
6. To identify the negative and positive impacts on the environment and ensure sustainable development.
7. An assessment of polluted hot spots, identifying the impact/damage to guide urgent actions.
8. Regional cooperation to tackle the Bilateral Environmental problems.
9. Raising community and public awareness using different awareness tools.
10. Improvements in wastewater treatment and sewage treatment.
11. The use of pesticides and fertilizers in a sustainable manner.

ABT 9: By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

Description of extent of contribution to the achievement of the ABTs with the evidence used

Iraqi's contribution to this target is reflected in the actions, which contribute to (NBSAP A.4.h) described in sections II of this report, the comprehensive list of Alien and Invasive species in Iraq is updated based on the resent published literatures.

Table 4-2 list of Alien and Invasive species in Iraq by numbers and kinds

Alien and Invasive Species (numbers of species)	Taxonomic group	Taxonomic sub-category	
Plants (60)	Aquatic plant (4)	Algae	1
		Aquatic plant	3
	Terrestrial plant (54)	Land plant/host	1
		Land plant/vine	6
		Terrestrial plant/tree	2
		Land plant/tree	23
		Land plant/shrub-tree	1
		Land plant/shrub	7
		Land plant/palm	2
		Land plant/herb	9
		Land plant/grass	5
Vertebrate (36)	Mammals		7
	Birds		7
	Fish		22
Invertebrates (23)	Molluscs		2
	Crustacean		4
	Carb		1
	insect		15
	arthropod		1
		Total	**119**

There are relatively weak controls on species transmission across the Iraq borders. This may have been the cause of a number of alien species which have been deliberately/unintentionally introduced into Iraq's various habitats. There are 14 species listed in the IUCN Red List under the category 'introduced' in Iraq (see Sec I /NBT18). Due to the potential negative impacts of non-native species on the indigenous biological diversity in Iraq, national cross-border control and surveillance is required to reduce the spread of invasive alien species.

The number of invasive alien species has increased due to the following reasons:

- The entry of some species via imported goods through the Iraqi border; e.g. route of entry for red palm weevil is via importation of palm *Rhynchophorus Ferruneugis*.
- The introduction of some species for use as decorative plants has led to negative impacts on water bodies, e.g. the Nile flower (*Eichhornia*).
- Some species are introduced deliberately to the country, such as *Azolla Filiculoides* which spreads rapidly in Iraqi rivers.

Risks of five alien invasive plant species that entered to the Iraqi environment were identified by MoA /national Seed Inspection /Certification Services publication (2016) which includes the following:

Prosopis spp risks include:

1. Large population groups that are difficult to be removed.
2. Extension of its roots to very deep distances affecting groundwater.
3. Impacts on soil structure.
4. Decreasing the density of the accompanying grass species to 50%.

Hydrilla verticillata risks include:

1. Competition with local species for nutrients and therefore inhibits their growth.
2. Prevents the passage of sunlight through the water.
3. Changing the chemical composition of water.

Measures were taken to eradicate existing alien and invasive species:

1. The list of alien and invasive species mentioned in 5NR was updated based on new studies (see Sec II NBSAP/A.4.h).
2. Preparation of draft regulation to control the presence and circulation of invasive alien species in cooperation with relevant ministries and institutions (MoA, Natural History Museum, General Customs Authority, MoHESR, MoC), adoption is in process, the instructions include:

- Preparation of a list of alien invasive species, registered in the Iraqi environment, types that are likely to enter, recommended to be updated every two years or as based on special need.
- Control measures that should focus on preventing the introduction of invasive alien species at border points, eliminate the damage caused by the introduction, eradicate the alien and invasive species through cooperation between the Ministry of the Environment and the Ministry of Agriculture where control could be either by pesticides or mechanical/ biological control.
- Preparation of monitoring/reporting system for any new cases of alien/invasive species, to take actions on the control measures and risks assessment.
- The introduction of species for studies and scientific researches was excluded, it will be handled under different legal framework.

3. Plan to establish a program to monitor 30 species of the most dangerous invasive alien species, their damage and the pathways of their invasion of Iraq.

ABT 10: By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.

Description of extent of contribution to the achievement of the ABTs with the evidence used

The scenarios of the IPCC in its 5th report (2013) indicated exposure of the Arabian area, including Iraq, to climate change (increase in mean temperature and decrease in mean rain precipitation). In addition, the report mentioned the effects of sea level rise and acidification on the coastal area in the south of Iraq. Some academic studies and scientific reports in Iraq have indicated increases in the mean temperature and reduction in rain precipitation between the past and present in Iraq, but there is no clear projection available at the country level. Such studies have shown that the mean temperature increased by 1.5-2.5 °C in the period between 1941 to 2009 (*reference: INC the UNFCCC 2015)* other studies have shown an increase by +5°C in the period 1960 to 2007 (*reference Awadh and Ahmad, 2012*). The same studies indicated a reduction in annual mean rainfall from 550mm to 200mm in Northern Iraq and from 250mm to 75mm in Southern Iraq, whilst levels in the west remained steady over the same period. The studies have clearly highlighted the south of Iraq, including the coastal area surrounding Basra city, to be the most exposed to climate change. Iraq ratified the convention on climate change UNFCCC in 2009 and since then important measures have been taken to reduce impacts of climate change. For example, the country enhanced its policies and suggested, according to Paris climate agreement, 14% of the business as usual (CO_2eq) to be mitigated between 2020 to 2035 *(Reference: iNDC to UNFCCC 2015 Agreement report 2015*). On the other hand, important actions have been taken to reduce pressures on the priority vulnerable ecosystems in the south of Iraq. For example, the government declared the Central Marsh as the first Protected Area and implemented the following actions:

1. Several economic projects were invested in the buffer zone of the Marshlands area to increase income of the local people;
2. Legislation on hunting control in the Marshland was issued to decrease over-hunting and illegal methodologies of fishing, such as the use of electricity.
3. The Mesopotamian Marshlands were nominated as a world heritage site and as multiple Ramsar sites.

However, there were no actions taken to decrease vulnerability of the coastal area and evaluate impacts from sea level rise and acidification although limited evidence suggests a recent improvement in ocean health. Prioritising the most exposed areas and enhancing national legislation are both considered good steps forward, but urgent action is required as the pressures did not reduce between 2014 and 2018, and more actions are required in the future to tackle the impacts of climate change in Iraq.

Coral reefs (see Figure 4-4) is one of the most vulnerable ecological sites Iraqi waters of the Arabian Gulf. Although the turbid waters of Iraq coastal territory prevented the detection of the potential presence of coral reefs in Iraqi coastal water satellite observations and joint expeditions performed by scientific scuba divers from MSC Basra (Iraq) and SDC Freiberg (Germany) carried out in September 2012 and in May 2013, revealed the existence of a true live coral reef in Iraqi coastal waters for the first time. The newly discovered reef at the mouth of the

Shatt al-Arab is located in a zone of low visibility, and rapidly changing conditions (temperature and salinity) due to strong currents. These currents are triggered by tides and the significant freshwater sediment-loaded discharge by the Shatt Al-Arab. These corals are adapted to one of the most extreme coral-bearing environments on earth: the seawater temperature in this area ranges between 14 and 34°C. This exceeds the temperature tolerance of most corals, which are generally accepted to occur in waters between 18 and 28°C. A number of living stone corals with several ophiuroids were observed, sponges and bivalves also but their existence can damage or destroy coral colonies. This area in Iraq has witnessed extensive historical impacts from a number of significant environmental, climatic, and human stressors. Further investigations are urged to monitor and catalogue the biodiversity within this unique turbid water tolerant coral reef community.
Military conflicts, the lack of adequate coordination and sufficient management capacity, as well as principal disharmony among littoral states endanger conservation and the survival of these corals. These valuable habitats urgently need protection, conservation, and research. Coastal waters face numerous threats, including the impact of oil and gas extraction, coastal development with inadequate marine engineering, unsustainable fishing, poor waste management and the deterioration of water quality. Protecting the coral reefs could substantially increase yields for Iraqi fisherman, as 49% of domestic fish species rely on reefs. The study authors suggest evaluating the health of the Iraqi coral reefs could be a valuable biomarker as the effects of climate change become more pronounced.

map provided by Reef Base (http://www.reefbase.org,)

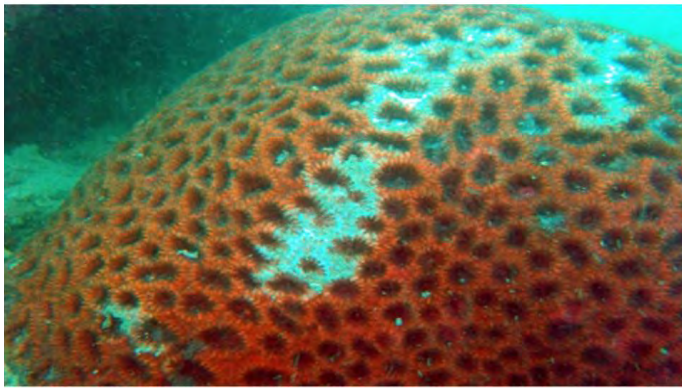


Figure 4-4 A reef complex in Iraqi waters discovered for the first time.

Stony coral Platygyra pini Chevalier, showing anchor damages (width of the image: ca.1 m). (Underwater images were made by Thomas Pohl, and maps were made by Sameh W. Al-Muqdadi).
https://www.researchgate.net/publication/260611105_Discovery_of_a_living_coral_reef_in_the_coastal_waters_of_Iraq

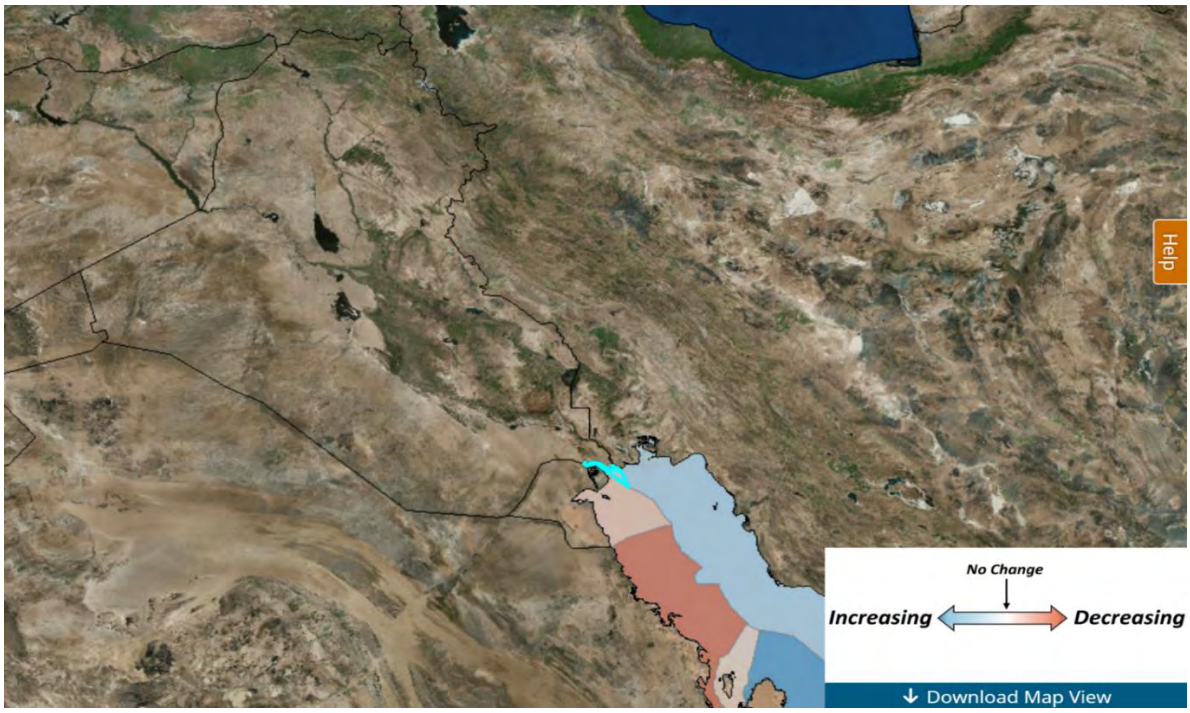


Figure 4-5 Ocean health index change for Iraqi maritime areas (source: http://www.oceanhealthindex.org/). The blue color indicates an increase in ocean health, but the data is only available from 2012-2016.

websites

- *Iraq's 1st national communication to the UNFCCC 2015*
- *iNDCs report*

http://www.moen.gov.iq /6NR/Reports

- *source: Awadh and Ahmad, 2012*

https://www.iasj.net/iasj?func=fulltext&aId=79816

ABT 11: By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of Protected Areas and other effective area-based conservation measures, and integrated into the wider landscape and seascapes

Description of extent of contribution to the achievement of the ABTs with the evidence used

Iraqi's contribution to this target is reflected in the actions which contribute to NBSAP/ A.2.a and A.3.a described in sections II of this report on establishment of the National Commission for Protected Natural Sites.
There are 23 sites included in the World Protected Area database (https://www.protectedplanet.net/) of which five have formal legal protection. In addition, there are 18 sites (in Sec II in Table 2-7 NBSAP A.4.a) out of 23 proposed for formal protection and 82 in the KBA report (2017) which are considered prepared for nomination sites for formal protection. These natural sites are rich in biological diversity as well as a number of endemic species of biodiversity components or availability of one or more species of threatened species and areas of the country with the highest threat levels.

The area represented by the Iraq KBAs (82 sites) comprises 6.5 %(28,388 km^2 (of the total area of the country and covers a variety of habitat types while (23 sites) comprises 1.53%. (see Sec II NBSAP A.4.a) explain more information on KBA sites selection with the highest threat levels.

ABT 12: By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

Description of extent of contribution to the achievement of the ABTs with the evidence used

Iraq has its own (national) updated lists of threatened species mentioned in Sec II NBSAP/A.3.b. However, reducing the risk of species extinctions requires substantial efforts to decrease threat levels, and to ensure adequate habitat protection. To design and monitor effectiveness of actions requires monitoring (and thus regular surveying) to quantify changes in populations and understanding of the relationship between threats and species. Major actions by Iraq to aid Aichi Target 12 include: (i) the identification of suitable protected areas and formal ratification of those areas (see Sec II NBSAP A.3.a); (ii) surveys across 82 Key Biodiversity Areas in Iraq; and (iii) an upward trend in research about biodiversity since the 5th National Report. Based on published research, no species has been definitively documented to have gone extinct in Iraq; however, Haditha Cavefish *Caecocypris Basima* is known from just one site in western Iraq and is possibly extinct (IUCN 2018) *https://archive.org/stream/biostor-115/biostor-115_djvu.txt)*

Conservation status of species.

1. Birds

There are 409 bird species that occur in Iraq listed on the IUCN Red List of Threatened Species (accessed on 22/11/2018). The population changes of these 409 species are grouped into four categories (numbers of each species in each category shown in parentheses): unknown (43); stable (133); decreasing (159); and increasing (74). In addition, the IUCN status of several bird species changed since the 5th National Biodiversity Report 2014 some as a result of more research. Examples include:

1.1 Research on Steppe Eagle *Aquila nipalensis* in Iraq contributed in the upgrading of the species from vulnerable to endangered [(a)]

1.2 Birdlife International (2018) has upgraded Common Pochard *Aythya farina* from least concern to vulnerable. However, the occurs across many countries and so this coupled with the lack of specific monitoring in Iraq makes it unclear how much Iraq has contributed to this change in status. Changing in the country's hunting policies, enforcement of current hunting laws/legislation and established single species action plans has only moved forward relatively slowly.

2. Amphibians and reptiles

There are 81 amphibian and reptile species that occur in Iraq listed on the IUCN Red List of Threatened Species (accessed on 22/11/2018). The population changes of these 81 species are grouped into four categories (numbers of each species in each category shown in parentheses): unknown (26); stable (35); decreasing (16); and increasing (2). Little information about these groups was available in the 5th National Report.

3. Mammals

There are 103 mammalian species that occur in Iraq listed on the IUCN Red List of Threatened Species (accessed on 22/11/2018). The population changes of these 103 species are grouped into four categories (numbers of each species per category shown in parentheses): unknown (35); stable (33); decreasing (29); and increasing (6). Little information about this group were available in the 5th National Report.

Recent work on this group includes a checklist of 93 mammal species of Iraq published in 2015 [(b)]. Since 2014, additional records of two bat species were added to Iraq: Geoffroy's Myotis *Myotis emarginatus* and Mediterranean Horseshoe Bat *Rhinolophus Euryale*, the latter is listed as Near Threatened by IUCN. This checklist is considered as a milestone to the biodiversity survey work of MoHEnv and Iraqi environmental institutes.

4. Fish

A total of 311 fish (23 from the class: Chondrichthyes & 288 from the class Actinopterygii) from Iraq are listed on the IUCN Red List of Threatened Species (accessed on 08/04/2019). The population changes of these species are grouped into four categories (numbers of each species in each category shown in parentheses): unknown (198); stable (61); decreasing (51); and increasing (1), A survey of fish species in the Iraqi marine waters was carried out from November 2014 to March 2018. The list included 214 species representing 75 families. The family Carangidae dominated the marine fish in Iraq, with 24 species, followed by Haemulidae with 11 species, then Serranidae and Sparidae with nine species each, while 34 families were contained a single species only [c] · Additional information on threatened species found that the conservation status of Haditha Cave Fish *Caecocypris basimi* and Hadith Cave *Garra Typhlogarra widdowsoni* have been changed from vulnerable to critically endangered based on recent surveys (IUCN 2018).

Proportion of threatened Species

1. Birds (5% threatened in Iraq)

A total of **374** bird species native to Iraq have been assessed by the IUCN Red List of Threatened Species. A subset of **17** of these species (5%) are classed as threatened: **three** are critically endangered CR – Northern Bald Ibis *Geronticus eremita*, Slender-billed Curlew *Numenius tenuirostris*, Sociable Plover *Vanellus gregarius*; **six** are endangered EN Basra Reed Warbler *Acrocephalus griseldis*, Steppe Eagle *Aquila nipalensis*, Saker Falcon

Falco cherrug, Egyptian Vulture *Neophron percnopterus*, White-headed Duck *Oxyura leucocephala*, Pallas's Fish-eagle *Haliaeetus leucoryphus*; and 11 are vulnerable VU, Lesser White-fronted Goose *Anser erythropus*, Eastern Imperial Eagle *Aquila heliacal*, Common Pochard *Aythya farina*, Red-breasted Goose *Branta ruficollis*, Asian Houbara Bustard *Chlamydotis macquenni*, Greater Spotted Eagle *Clanga clanga*, Marbled Teal

Marmaronetta angustirostris, Great Bustard *Otis tarda*, European Turtle-dove *Streptopelia turtur*, Rustic Bunting *Emberiza rustica*, Socotra Cormorant *Phalacrocorax nigrogularis* - still uncertain presence in Iraq (see http://www.iucnredlist.org/). Three endemic bird taxa are confined to the dense reed beds of southern Mesopotamian marshes which are Basra Reed Warbler *Acrocephalus griseldis*, Mesopotamian Crow *Corvus cornix capellanus*, and Iraqi Little Grebe *Tachybaptus ruficollis iraquensis*.

Globally 13% (1469/11122) of bird species are threatened with extinction (https://newredlist.iucnredlist.org/about/background-history) so, the proportion of birds in Iraq is lower (at 5%) than the global figure for this class.

The number of bird species in Iraq has grown since the last assessment according to [d], a total of 405 bird species have been recorded in Iraq. Subsequent to this checklist several more species were added to the avifauna of Iraq including: Thick-billed Lark *Rhamphocoris clotbey* [e]; Heuglin's Gull *Larus heuglini* and Steppe Gull *Larus (cachinnans) barabensis*[f] Al-Sheikhly and Al-Barazangy (2015), Lesser Spotted Eagle *Clanga pomarina*, Eastern Bonelli's Warbler *Phylloscopus orientalis*, Olive Tree Warbler *Hippolais olivetorum*, Goldcrest *Regulus regulus* [g] (Ararat, 2016), and Scrub Warbler *Scotocerca inquietavv*[i]. *These additions bring the total of recorded species in Iraq to 413 bird species.*

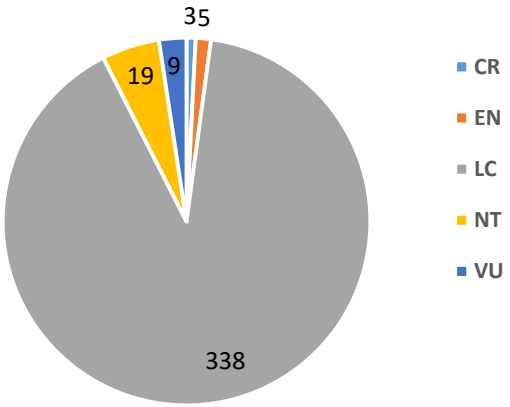


Figure 4-6 Bird species (in Iraq) assessed by the IUCN Red List of Threatened Species (data presented here downloaded on 14/09/2018).

This chart is derived from 374 native bird species linked to Iraq on the IUCN Red List. The additional 39 species that have been recorded in Iraq are not currently linked to Iraq in the IUCN Red List. 90% of those bird species assessed are of least concern with only 5% categorized as threatened and 5% as near-threatened.

2. Amphibians and Reptiles (6% threatened in Iraq)

A total of 65 species have been assessed by the IUCN Red List for Threatened Species (database accessed on 14/09/2018), of these species two were classified as Critically Endangered - Hawksbill Turtle sub-species *Eretmochelys imbricata bissa* and Leather back Sea Turtle sub-species *Dermochelys coriacea schlegelii*; four Endangered – Euphrates Softshell Turtle *Rafetus euphraticus*, Loggerhead Sea Turtle *Caretta caretta*, Green Turtle *Chelonia mydas* and Zebra Snake *Spalerosophis microlepis*; Three Vulnerable - Olive Ridley *Lepidochelys olivacea*, Spur-thighed Tortoise *Testudo graeca ibera* and Egyptian spiny tailed lizard *Uromastyx aegyptia*. Amphibians classified threatened were: one Critically Endangered Kurdistan newt *Neurergus microspilotus*; one Vulnerable Lake Urmia Newt *Neurergus crocatus*.

Globally 25% (3336/13351) of reptiles and amphibians are listed as threatened (*http://cmsdocs.s3.amazonaws.com/summarystats/2018)1_Summary_Status_Page_Documents/2018_1_RL_Status_Table_3a.pdf - accessed on 09/10/2018*) which is far higher than the proportion of threatened species in this group found in Iraq – although note below the number of species that have yet to be assessed in Iraq.

The latest estimate of the number of species from this group found in Iraq is provided by [(j)]. This study reported a total of 115 species: 105 species of reptiles and 10 species of amphibians in Iraq. Thus 40 species found in Iraq have not yet been assessed in the IUCN Red List. Since this study there are new additions to the list of species recorded in Iraq. A new species *Hemidactylus kurdicus* sp. nov. was recently recorded from one locality in Qara Dag mountain in Northern Iraq (Kurdistan) [(l)]. Iraq has only one endemic reptile species which is the Safin leaf-toed gecko *Asaccus saffinae*.

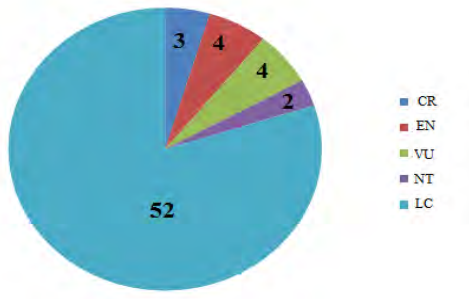


Figure 4-7 Reptile and Amphibian species (in Iraq) assessed by the IUCN Red List of Threatened Species (data presented here downloaded on 14/09/2018).

This chart is derived from 65 native species linked to Iraq on the IUCN Red List. The additional 40 species that have been recorded in Iraq are not currently linked to Iraq in the IUCN Red List. 91% of those species assessed are of least concern with only 5% categorized as threatened and 3% as near-threatened.

3. Mammals (18% threatened in Iraq)

According to [(b),] there are a total of 93 mammals species recorded in Iraq, but subsequent species have been added to this list. The categories of classification for the IUCN Red List of Threatened Species is shown in Figure 4 below. Iraq has two endemic mammals' species: Long-tailed Nesokia *Nesokia bunnii* and Iraq's Smooth-coated Otter *Lutrogale perspicillata maxwellii*.

Globally 21% (1223/5792) of mammals are listed as threatened (IUCN Red accessed on 09/10/2018) which is higher than the proportion of threatened species in this group found in Iraq.

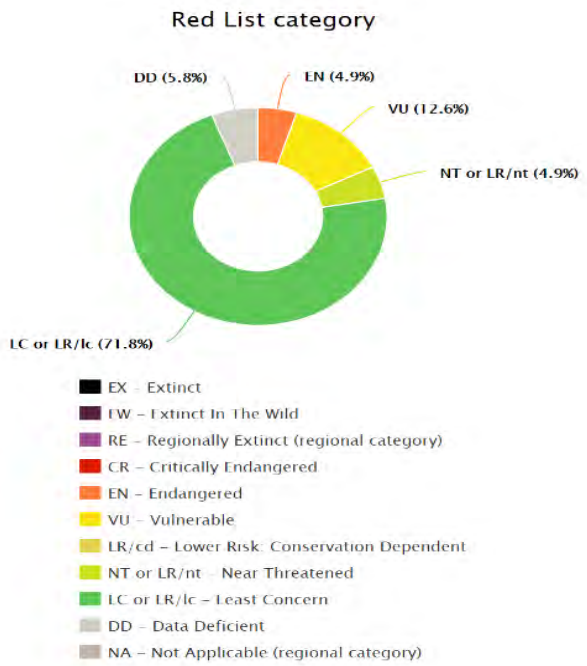


Figure 4-8 The red list categories of the 103-mammal species assessed by the IUCN Red List of Threatened Species (data presented here downloaded on 12/11/2018).

4. Fish (7% threatened in Iraq)

A total of 311 fish (23 from the class: Chondrichthyes & 288 from the class Actinopterygii) from Iraq are listed on the IUCN Red List of Threatened Species (accessed on 08/04/2019): four Critically Endangered; five Endangered; and 13 Vulnerable. Globally 14% (2323/17111) of fish species belonging to these two classes are listed as threatened (IUCN accessed on 08/04/2019) which is higher than the proportion of threatened species in this group found in Iraq.

Eleven threats were prioritized in KBA in Iraq according to their negative impacts on biodiversity mentioned in Sec II NBSAP A.4.b. The threats were categorized according to the IUCN list of threats.

websites

[a] *https://www.researchgate.net/publication/323594076 Ring Recoveries from Steppe Eagles and Eastern Imperial_Eagles_from_the_Russian_and_Kazakhstan_Breeding_Populations_and_a_Review_of_Major_Threats_to_Eagles_in_Iraq*

[b] *https://www.researchgate.net/publication/271726184 First confirmed records of two bat species for Iraq_Rhinolophus_euryale_and_Myotis_emarginatus_Chiroptera*

[c] *http://jnhm.uobaghdad.edu.iq/index.php/BINHM/article/view/275*

[d] *https://www.researchgate.net/publication/320076208_Annotated_Checklist_to_the_Birds_of_Iraq*

[e] *https://www.researchgate.net/publication/261635035_THE_FIRST_RECORD_OF_THE_THICK-BILLED_LARK_RHAMPHOCORIS_CLOTBEY_BONAPARTE_1850_FOR_IRAQ*

[f] *http://www.marineornithology.org/PDF/43_2/43_2_245-248.pdf*

[g] *http://www.academia.edu/24237020/106Sandgrouse_38_2016_First_record_of_Lesser_Spotted_Eagle_Clanga pomarina first breeding record of Eurasian Penduline Tit Remiz pendulinus and first records of Eastern Bonelli s Warbler Phylloscopus orientalis Olive Tree Warbler Hippolais olivetorumand Goldcrest Regulus_regulus_for_Iraq*

[i] *https://www.researchgate.net/publication/315824329_First_Scrub_Warbler_Scotocerca_inquieta_record_and_first_breeding_observations_of_Desert_Finch_Rhodospiza_obsoleta_for_Iraq*

[j] *https://www.mapress.com/j/zt/article/view/zootaxa.4363.3.4*

[l] *https://www.ncbi.nlm.nih.gov/pubmed/29245379*

ABT 13: By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

Description of extent of contribution to the achievement of the ABTs with the evidence used

MoA is responsible for management of genetic resources, both of plants and animals.

The National herbarium is one of the MoA important entity, it is national museum that preserves the plant wealth in Iraq, which is collected from all governorates of Iraq through field trips and continuously during the seasons and, the Genetic Resources Bank is one of the specialized centres for the conservation of plant genetic material. which includes most of the raw materials of the Iraqi wild and cultivated species in Iraq There are about 2815 (genetic Accession Number) in the plant gene bank, which is divided into groups as follows:

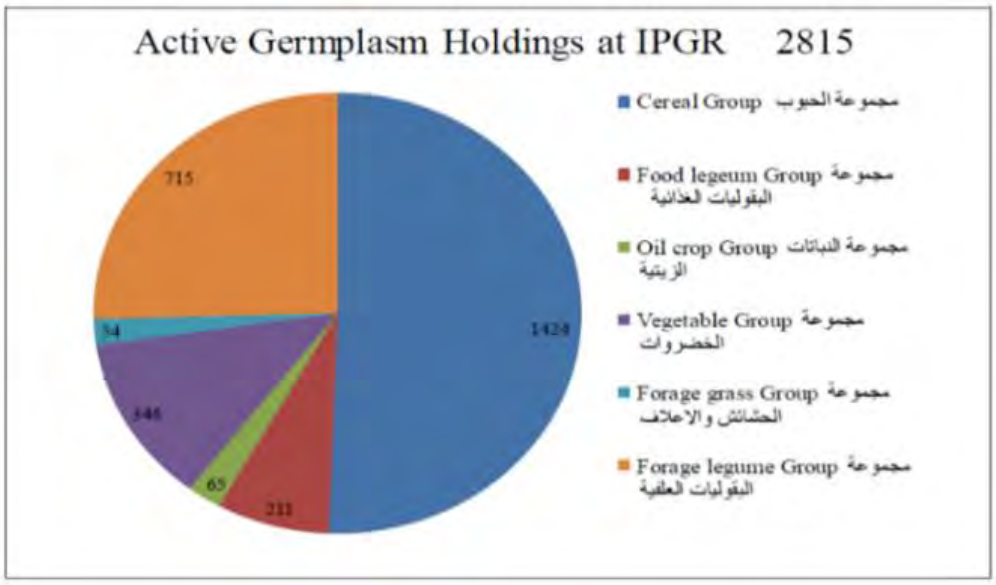


Figure 4-9: The gene bank plants with plant groups.

90 species of endangered wild plants were recorded in field surveys throughout Iraq and the map below shows the areas of surveys and collection of the genetic origins for 2018 on GPS.

Figure 4-10 Map showed the sites of national herbarium and plant genetic resources surveys in Iraq

As for the conservation of animal genetic resources, there is no significant progress. However, the MoA / Directorate of Animal Resources / Genetic Resources Department seeks to preserve these resources for the country through the follow-up of global activities and in accordance with biotechnology. A section has been established to identify these animals in terms of morphological and genetic descriptions. Iraq also seeks to conserve the animal genetic resources of the Iraqi animals (e.g. semen, eggs, embryos, body cells) in order to preserve local breeds with their entire genes and return them to the environment in cases of severe threat.

1. A national consultative committee for animal genetic resources was established under in MoA with relevant bodies (environment, science and technology, higher education and scientific research). The committee worked on drafting a law for conservation, conservation and circulation of animal genetic resources for the purpose of organizing, collecting, preserving, maintaining and exchanging animal genetic resources, heritage knowledge and related practices and their sustainable use as the strategic repository for the diversity of animal genetic resources in Iraq and protecting them from extinction and

loss. The draft is under review and approval by the Council of Ministers for transmission to the Iraqi Council of Representatives. Iraq has a wide variety of livestock for various farm animals (numbers of brackets indicate numbers in Iraq): cattle (170810), buffalo (22238), goats (12515), sheep (208111), camels (2542), based on 2018 statistical information. There are four local breeds of cattle with two local-hybrids and four local breeds of sheep, and also four local breeds of goat and two breeds of camel.

2. National committee for the registration and certification of plant species of vegetables and grains crops, which culminated in the completion of the Law on registration, adoption and protection of plant species No. 15 of 2013 , this committee adopted a scientific approach for the evaluation and documentation of the agricultural species produced in Iraq and published (The database of species and agricultural hybrids) on the website of the MoA (www.zeraa.gov.iq). The database in 2014 included 823 plants: 398 (certified), 142 (certified and registered), 112 (already used by farmers) and 11 (registered only).

3. The quality control and seed control programmes have supported by 'Seed Inspection and Certification' Department. This department is the specialized technical agency for the seed program and the competent seed quality control system. The seed programme is based on the regulations and instructions of the International Seed Testing and Certification Association (International Rules for Seed Testing ISTA, 2019), (see https://www.seedtest.org/en/international-rules).

4. In the area of import control, central laboratories for physical, chemical and genetic seed testing were established in Baghdad, which is affiliated to the Seed Inspection and Certification Department through the DNA Project. The DNA project aims to develop the genetic identification of Iraqi varieties and to detect the genetic modification of crops and seeds. In addition, MoA also works to prevent the entry of these genetically modified plants (GMO) into Iraq and prevent their circulation within Iraqi markets.

Websites

- *Registration, adoption and protection of plant species law No. 15 of 2013.*

http://www.moen.gov.iq /6NR/legislations

ABT 14: By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and wellbeing, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.

Description of extent of contribution to the achievement of the ABTs with the evidence used

Ecosystem services are essential for human life, for example, by providing nutritious food and clean water, ensuring healthy lives for humans and a safe environment, supporting the pollination of crops and soil formation, providing recreational, cultural and spiritual benefits., these assets are not adequately accounted for economic policy, which means there is insufficient investment in their protection and management.

Most ecosystem services that provide important services to Iraq from the terrestrial and marine ecosystems were identified in Table 7 of the NBSAP (2015-2020). An inventory of these ecosystem services was updated (see Sec II NBSAP/A.2.g), the current status of ecosystem in Iraq with reference to their main biodiversity values and threatened state are mentioned in Table 4-3 below, the services of the freshwater zones (the Upper Tigris and Euphrates regions and the areas below the Tigris and the Euphrates) have, so far, not been evaluated.

Table 4-3 Ecosystems of Iraq and their current status as assessed by the NBSAP and the World-Wide Fund for Nature (*WWF - https://www.worldwildlife.org*) and for marine areas by The Nature Conservancy organization (*https://www.nature.org*).

	Ecosystem	Threatened level based on NBSAP	Main Biodiversity Values	Current state evaluated by WWF
1	Tigris -Euphrates alluvial Salt Marsh	At risk	• Most important fresh-water system of the region • Migratory birds from Eurasia • Spawning fish from the Gulf • Endemic species • Traditional knowledge	Critical/Endangered
2	Arabian Desert and East Sahero-Arabian Xeric Shrublands	Partial risk	• Unique plant species • Important bird and mammal species • Endangered species • Endangered species • Medicinal plants	Critical/Endangered
3	Mesopotamian Shrub Desert	Partial risk	• Migratory birds from Eurasia • Endangered species • Rangeland value for local livelihoods	Vulnerable
4	Middle East Steppe	Partial risk	• Migratory birds from Eurasia • Endemic species • Rangeland value for local livelihoods	Vulnerable
5	Zagros mountains forest Steppe	Partial risk	• Forest ecosystems and rich flora diversity • Migratory species • Endemic species • Endangered species • Natural cave systems	Critical/Endangered
6	Somali /Arabian maritime coasts	At risk	• Support of marine life • Presence of a recently discovered Coral reef in the territorial waters of Iraq • Fishery resource for local livelihoods	Critical/Endangered

In Iraq the fastest declining ecosystem is the Tigris -Euphrates alluvial Salt Marsh, that area subject to the most immediate threat (in terrestrial ecosystems), and the associated freshwater areas (Upper Tigris and Euphrates regions and areas below the Tigris and Euphrates), which, although not formally assessed, are affected by the lack of water resources and drought. Terrestrial ecosystems and the marine coastal environment are exposed to a proliferation of alien and invasive species (see Sec II NBSAP A.4.h).

All major terrestrial and aquatic ecosystems and marine coastal environments in Iraq contain major areas of biodiversity including threatened and endemic species. The protected area network in Iraq needs to be expanded to protect these areas (see Sec II NBSAP A.3.a). Large parts of these ecosystems in Iraq still need to be assessed in terms of their importance to biodiversity.

There are wide range of potential drivers that caused loss of ecosystem services, but some of the strongest causes are likely to be:

- Climate change (impact on crop production, drought, threat to biodiversity).
- Increased use of land management practices linked to excessive cultivation.
- Pollution impacting on air, water and lands of the ecosystems.
- Loss of natural habitats.
- Increased desertification.
- Lack of awareness of the value of ecosystem services provided by biodiversity and the natural world to the economy.
- Lack of available financial resources to implement the plans on protecting ecosystems.
- Reductions in water resources for many parts of Iraq caused by upstream water management (e.g. dams)
- Wars and conflicts with their impacts on the infrastructure services (like the damage in water and sanitation systems), population stability (e.g. quality of life and sources of livelihood).

Another major threat to many areas comes from military impacts, especially in areas that have been subjected to security deterioration in recent years (e.g. Kirkuk, Diyala, Mosul and Anbar).

An example of the impact of Iraqi conflict in 2014 on loss of ecosystem services:

Agricultural damage and loss assessment across six of Iraq's 18 governorates: Anbar, Babil, Diyala, Ninewa, Salah al-Din and Wassit (FAO assessment, December 2016 - January 2017**)**

The Iraqi population remains extremely vulnerable, especially in liberated and ongoing conflict areas. Areas that have been liberated, or are experiencing ongoing conflict, have suffered the most, with wheat and barley production losses amounting to as much as 75 to 80 percent. Ninawa governorate produced virtually no grain or other foods due to destroyed crops and continued problems with insecurity, theft, looting and unexploded ordinances. A significant number of livestock were lost, dead or injured due to the conflict. On average, as much as three-quarters of cattle, sheep, goats and buffalo were lost, although in some areas this figure reached as high as 85 to 95 percent. Poultry losses were significant in all areas; in some cases, flock sizes numbering in the hundreds fell to virtually zero. Ongoing conflict areas have been hit the fisheries and aquaculture the hardest. In some areas, about 20 percent of men were engaged in the sector, compared with only two to six percent now. Fish Production losses were attributed to the high cost of fish feed and insufficient access to boats, fuel, gear, equipment and shops to purchase inputs such as lime, feed, seed and Fingerlings.

**87 percent of the households in assessed communities were engaged in agricultural and related activities prior to the crisis*

**Some75 percent of farmers relied on crop production for their income prior to the crisis*

**Livestock represented one-third of the total value of agricultural production in Iraq prior to the crisis*

** Since 2014, engagement in fisheries and aquaculture has fallen by 50 to 75 percent.*

https://reliefweb.int/report/iraq/iraq-agriculture-and-livelihoods-needs-assessment-newly-liberated-areas-kirkuk-ninewa

ABT 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.

Description of extent of contribution to the achievement of the ABTs with the evidence used

Deforestation, wetland drainage, overgrazing of grasslands and other types of habitat degradation lead to increased emissions of carbon dioxide, methane and other greenhouse gases, and to increase vulnerability to the impacts of climate change. Restoring degraded ecosystems can simultaneously increase carbon sequestration, improve climate resilience, and restore essential ecosystem services and safeguard biodiversity.
Government of Iraq undertook an action in marshland restoration, 50% of the marshland area was re-flooded between 2003 and 2018 (an area of c5000km^2) by the Iraqi government. This dramatically increased both biodiversity and the ecosystem services they provide, and a wider suite of services provided by the natural environment (such as provisioning services from the use of reeds by the Marsh Arabs). In addition, the rehabilitation enhanced resilience and carbon stocks of the area. Although, these efforts provided a good storage for carbon and thus contributes to climate change mitigation and adaptation. However, no precise calculation of CO_2 reduction provided has yet been calculated. The government of Iraq has undertaken several measures to protect this area and the restoration achievements between 2014-2018 are as follows:

1. Protecting the Iraqi Marshes as a World Heritage Site (listed in July 2016) is one way to increase ecosystem resilience. Carbon storage value of the Iraqi Marshes not yet calculated but likely to be substantial.
2. Preparation of the draft regulations on ecotourism in natural sites and World Heritage properties.

3. The declaration of the Natural Reserves System No. 2 of 2014, which was followed by the nomination of several sites to declare them as natural reserves listed on https://www.protectedplanet.net/country/IQ some of these sites are already designated and others are in the process of formal ratification (see Sec II NBSAP/A.3.a).
4. The preparation of programmes for environmental awareness of the importance of conservation of nature reserves as well as coordination with local stakeholders for the management of sites is needed as the areas now belong to the government (such activities can involve compensation for locals).
5. Iraq accedes to the Convention on the Regulation of International Trade in Endangered Species (in 2016) in order to ensure that endangered species are not depleted or affected.
6. Setting instructions on hunting and fishing in the Marshlands No. 2 of 2017.

Deforestation is a serious challenge as forest in KRG is the largest forests area in Iraq. Threats are identified in Sec I /NBT7 as well as desertification (refer Sec II NBSAP A.3.c). Measures have been undertaken to combat desertification through fixation of sand dune and the development of vegetation cover/forests, but still estimation of CO_2 stocks is unknown.

Iraq has a solid base of legislation on land and water use, protection of natural resources like forest in federal government as well as in KRG preventing agriculture lands exploitation and logging. Awareness by farmers and local communities have been raised about the risks of overgrazing, logging, using unsustainable farming practices in irrigation and drainage.

ATB 16: By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation

Description of extent of contribution to the achievement of the ABTs with the evidence used

Iraq continues to adhere to the Nagoya Protocol although there are number of challenges, items and obligations that cannot be met now, including the need to build the capacity of staff on establishment of a gene bank, preparation of a solid database of the genetic resources of all species (e.g. plants and animals).

Iraq (represented by the MoG) seeks to protect the genetic resources, which is one of the most important pillars of the agricultural sector in both animals and plants, through several measures, including:

- Accession to the International Treaty on Plant Genetic Resources for Food and Agriculture in accordance with Law No. 38 of 2012;
- Issuing the Agricultural Quarantine Law No. 76 of 2012;
- Issuing a law to register, approve and protect plant species No. 15 of 2013;
- Issuing annual reports on agricultural species through a National Committee for the registration, certification and protection of agricultural species.
- Issuing a database of the original agricultural species.

websites

- *Accession to the International Treaty on Plant Genetic Resources for Food and Agriculture in accordance with Law No. 38 of 2012*
- *Quarantine Law No. 76 of 2012*
- *Law to register, approve and protect plant species No. 15 of 2013*

http://www.moen.gov.iq /6NR/Legislation

ABT 17: By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.

Description of extent of contribution to the achievement of the ABTs with the evidence used

Iraq has prepared the NBSAP (2015-2020) under Cabinet Resolution No. 298 in 2015.

In addition, there are a set of strategies and action plans that deal with the objectives of Aichi Biodiversity targets including:

NESAP and the Executive Action Plan for the period 2013-2017

- Strategy of water and land resources management in Iraq (2015-2035)
- Strategic plan for MoA (2015-2025)
- NSPE (2018-2022)
- NDP (2018-2022)
- (INES)
- INC to the UNFCCC
- National Action Program to Combat Desertification, in line with the International Convention to Combat Desertification and the 10 the Strategic Plan of the Convention, 2008-2018.

There is no regional strategy or sub national strategy for biodiversity in Iraq. However, there is a NBSAP (2015-2020) that has been prepared and the plan of action has been approved by MoHEnv and the Council of Ministers.Through the implementation this national strategy programmes, in cooperation with relevant ministries and entities, awareness of the importance and sustainable use of biodiversity will be promoted. These programmes aim to promote environmental conservation and resource protection to push these issues up the national, and local, agendas.

NBSAPs are the key instrument for translating the CBD into national action. Article 26 of the Convention requires countries to prepare a national biodiversity strategy that reflects how a country intends to fulfil the objectives of the Convention. The process of revising the current NBSAP should involve all relevant stakeholders, should be a dynamic process that allows Iraq to identify priorities and establish plans that are consistent with Iraq national goals, and should be fully incorporated into national and sectoral development plans and strategies. In order to achieve this target, Iraq needs to assess how well the existing NBSAP addresses: existing conditions, trends and national targets; key constraints and opportunities in sustainable use, conservation and benefits sharing of biodiversity.

Websites

- *NBSAP (2015-2020).pdf*
- *NESAP (2013-2017).pdf*
- *National Program to Combat Desertification.pdf*

http://www.moen.gov.iq /6NR/Strategies and plans

- *INC*

http://www.moen.gov.iq /6NR/Reports

- *NSPE*

https://mop.gov.iq/en/page/view/details?id=88

- *INES*

http://documents.worldbank.org/curated/en/406941467995791680/Integrated-National-Energy-Strategy-INES-final-report

ABT 18: By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.

Description of extent of contribution to the achievement of the ABTs with the evidence used

There is limited progress in this target except for a few surveys completed in some provinces in Iraq (see Sec II NBSAP A.1.h). In addition, a few research articles have been published which discussed the importance of TK. Participation by locals was limited to some provinces in the south and north of Iraq and was unilaterally to benefit from natural resources without working on the development of programmes to conserve and sustain them.

Marshland ecosystem is conserved and sustained as "Iraqi Marshland" which has high natural values that have been designated to be included in the World Heritage List. This area is one of the most important areas that have maintained the natural pattern of a population lifestyle that extends to thousands of years.

A study in 2015 showed a decline of traditional ecological knowledge (TEK) in an important cultural area in the marshlands of Iraq. The study demonstrated that dehydration of the marsh has resulted in a decrease in TEK and traditional resource management by Marsh Arab women, leaving few opportunities to engage in traditional activities. TEK provides great cultural significance and socioeconomic benefits to Marsh Arab women and their families. While some TEK is still utilized today, most traditional knowledge is being lost due to lack of application. A clear example of this is that there are no longer traditional uses of medicinal plants by women. Other traditional ecological practices that are at particular risk include: rhythms of seasonal reed harvest and use, handicraft construction and sale from reeds, water buffalo husbandry and dairy production, and agricultural production. It may take only one generation for these practices to be forgotten.
Traditional activities are important to the local economy and have brought in more than $7.3 million per annum (Maltby 1994, Nicholson and Clark 2002). The major indigenous economic activities conducted by Marsh Arab families are fishing; raising water buffalo; collecting and processing reeds for buffalo fodder and home construction; and creating and selling handicrafts such as reed mats, baskets, fans, and pigeon houses to derive a livelihood. Ancient Mesopotamians used a wide variety of plants a range of medicinal, culinary, and magical uses (Potts1997). In modern Mesopotamia, Marsh Arab also used plants from the marshes for medicinal and healing purposes.
https://www.tandfonline.com/doi/abs/10.1002/ehs2.1207

Raising awareness initiative within marshland communities, held by MoHEnv, about the need for achieving a balance between preserving the exceptional ecological value of the marshlands as an ecosystem of global importance, and the sustainable and equitable use of natural resources. The communities were exposed to the concept of sustainable ecotourism which can open opportunities for marketing of environmentally-friendly products from the marshlands based on local artisanal crafts, creating jobs and opportunities for supporting Marshland-based livelihoods.

Economic recovery in this region was an outcome of this initiative through:

- Opening of marketing outlets for sale of dairy products;
- Offering eco-tourism services based on traditional crafts, and reviving local food;
- Creating Jobs with a particular focus on women as producers and artisans.

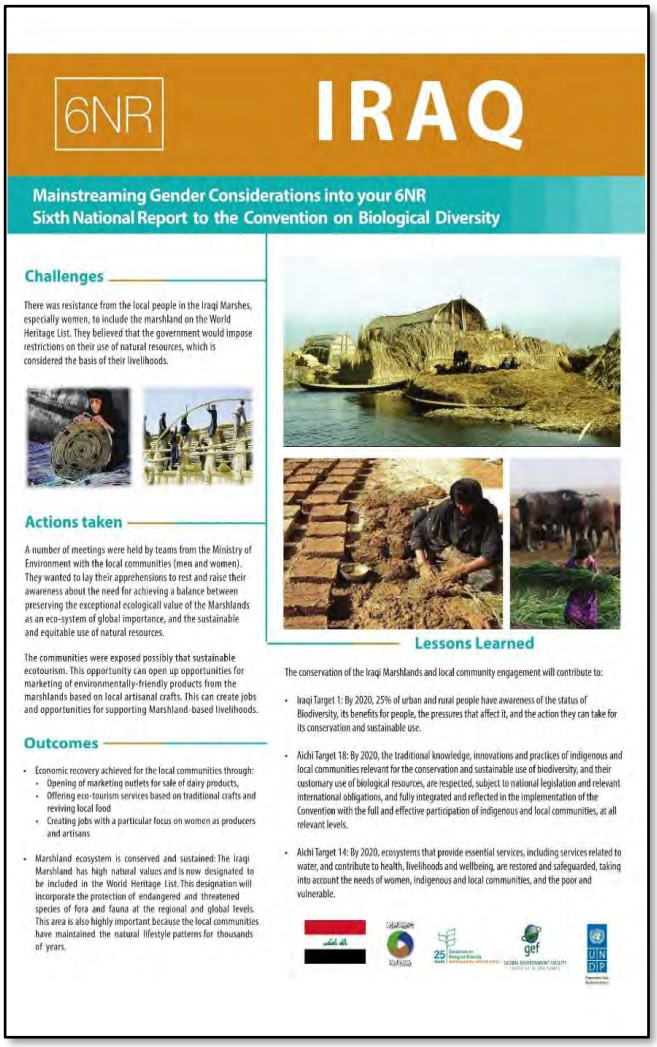


Figure 4-11 Poster on successful story for raising awareness of Arab Marshes on the value of designation their region in the World Heritage List, submitted by Iraqi delegation in COP14 / Sharm Al Sheikh (2018)

ABT 19: By 2020, knowledge, the science base and technologies relating to biodiversity, its values functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.

Description of extent of contribution to the achievement of the ABTs with the evidence used

Information and understanding are essential for managing and conserving biodiversity. Iraqi information on biodiversity is growing through efforts to incorporate relevant information from multiple stakeholders, through coordination with research centers, scientific universities and civil society organizations specialized in the protection of nature. This collaboration includes the involvement of local communities to update databases, establish websites for sharing information, research, field surveys are conducted jointly to update biodiversity status, assessing change and damage and loss.

ABT 20: By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan 2011-2020 from all sources and accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels. This target will be subject to changes contingent to resources needs assessments to be developed and reported by Parties.

Description of extent of contribution to the achievement of the ABTs with the evidence used

MoHEnv has addressed resource mobilization to highlight critical needs and a general set of actions in order to set the national framework for enhancing international financial flows and domestic funding for the NBSAP in the 5-year period 2015-2020. (see *http://www.biodiv.be/iraq*).

However, the progress of Iraq is still very limited, and the mechanism for evaluating the financial needs for implementation of biodiversity policies and plans has not developed yet. There is no special budget allocated for NBSAP implementation, mainly because Iraq faced an economic crisis after 2015 with low international oil prices and a poorly diversified economy, vulnerable security situation and political instability. These factors continue to slow economic growth and divert government expenditures for social and economic services to defence against terror, thus negatively affecting annual budget allocations from relevant ministries.

The ministries at central, regional and local levels have contributed (in kind) through the coverage of surveys/missions by providing site teams (e.g. salaries and other logistic expenses). Some ministries have their own funds (for example environment fund in MOHEnv) that has been used to finance actions ABT using fines and taxes collected as a result of transgressions of Environmental Laws.

External funds from donors or global facilities like GEF, adaptation fund, contribute to support countries including Iraq on projects concerned with biodiversity issues (see Sec I NBT 23) which describes the number of funded projects with specific information of the objectives, period of implementation and the allocated budget.

Linkages of Biodiversity Targets with SDGs

Government of Iraq's measures to implement Agenda 2030 for Sustainable Development

The Government has made efforts to integrate the SDGs into the National Development Plan (2018-2022), based in four sectors: economic, social, environmental and governance.

The Ministry of Planning has sought to create the necessary frameworks to coordinate with all stakeholders in Iraq to integrate the sustainable development agenda 2030 with national plans and strategies through the National Committee on Sustainable Development (NCSD) headed by Minister of Planning is mandated to monitor Progress on the SDGs and prepare national reports on this progress , to be submitted to a high level following up group for their consideration and guidance. A number of specialized technical committees (including Technical committee on Environmental Sustainability) have been put in place to support the NCSD including those in the following areas: 1) Poverty reduction (Goals 1, 2 and 10); 2) Environmental sustainability (Goals 6, 13, 14, and 15); 3) The Green Economy (Goals 7, 8, 9, 12, and 17); 4) Cities and human settlements (Goal 11); 5) Human development (Goals 4 and 5); 6) Population and development (Goal 3); 7) Awareness raising; 8) Good governance (Goal 16); and 9) Statistics and information.

The NCSD is also supported by committees on Sustainable Development in each governorate (GSDG); these committees monitor progress on the SDGs at the governorate level.

The 2030 Agenda for Sustainable Development, the SDGs and the Paris Agreement on Climate Change, Sendia Framework on Disaster Risk Reduction all highlight that for development to be sustainable, it must be resilient to increase complex environment and climate risk. In response, there are a number of goals under the SDGs that together form a scaled-up risk-informed and environmentally sustainable:

SDG 2	End hunger achieve food security and improve nutrition and promote sustainable agriculture.
SDG 6	Ensure availability and sustainable management of water and sanitation for all.
SDG 7	Ensure Access to Affordable, Reliable, Sustainable and Modern Energy for all.
SDG 11	Make cities and human settlements inclusive, safe, resilient and sustainable.
SDG 12	Ensure sustainable consumption and production patterns.
SDG 13	Take urgent action to combat climate change.
SDG 14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development.
SDG 15	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

Altogether, these "Green SDGs" along the other SDGs represent a comprehensive and integrated approach with major breakthrough and shift in the development agenda. As the works now moves to the SDG implementation agenda, a key focus is on bottom -up local solutions. this holds importance for Iraq, which faces of serious climate and environmental risks to the sustainability of its development.

The Technical Committee on Environmental Sustainability in a workshop organized and facilitated by UNDP, reviewed priorities and challenges related to the implementation and monitoring of selected 'green' sustainable development goals in Iraq. Mapping the institutional responsibilities for the implementation of the goals across various Ministries was undertaken. Sustainable development objectives 6, 7, 13 and 15 were identified as priority areas of concern while sustainable development objectives 2, 12 and 14 were identified as secondary priority levels. The committee also set indicators for Iraq based on the implementation framework of the environmental dimension of SDGs in the Arab Region which was adopted by League of Arab States on Sep 2017. The technical committee identifies baselines with initial mapping of interactions and synergies between environmental SDGs and other relevant SDGs. The spotlight was focused on challenges and capacity gaps faced, major challenges of biodiversity mainstreaming and monitoring challenges including lack of data for some indicators. It was also noted

that there was a limited capacity for environmental data analysis and reporting for monitoring purposes and use by decision makers and a limited capacity to coordinate the implementation of environmental SDGs and to integrate environmental concerns across sector plans. The findings of the workshop provided a foundation to facilitate implementation of the environmental SDGs and prepare for environmental SDG reporting for Iraq.

Linkage between the National Biodiversity Targets, Aichi Targets and the SDGs

The National Biodiversity Targets derived from Aichi Targets including the actions associated with these related to the SDGs are presented in the Table below.

Aichi Targets	National Biodiversity Targets	Primary SDGs	Secondary SDG	SDGs Targets related to Biodiversity Targets
ABT 1 Awareness of biodiversity increased	National Target 1: By 2020, 25% of urban and rural people have awareness of the status of biodiversity, its benefits for people, the pressures that affect it, and the actions they can take for its conservation and sustainable use. National Target 2: By 2020, 50% of policy makers and planners have awareness of the status of biodiversity, its benefits for people, the pressures that affect it, and the actions they can take for its conservation and sustainable use. National Target 3: By the end of 2015, a national survey of tools used for public awareness of biodiversity is completed. National target 4: By 2020 the use of tools (films, publications, educational programmes, guidance materials, and training) for raising awareness of biodiversity is improved with locally defined, area based and targeted awareness programs (e.g. governorate level).	SDG 4 Quality Education	SDG 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	4.7: By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development
		SDG 12 Responsible Consumption and Production	SDG 12: Ensure sustainable consumption and production patterns.	12.8: By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature

Aichi Targets	National Biodiversity Targets	Primary SDGs	Secondary SDG	SDGs Targets related to Biodiversity Targets
Aichi Target 5 Habitat loss	National Target 5: By the end of 2020, produce a GIS database of the extent, condition and protection status of the natural semi-natural and human modified habitats of Iraq has been developed. National Target 6: "By the end of 2020, the reasons for loss and degradation of each of the natural semi-natural and human modified habitats of Iraq have been identified to inform conservation actions. National target 7: By the end of 2016, major pressures on forest ecosystems have been identified and studied. National Target 8: By the end of 2020 legislation has been enacted to address major pressures on forest ecosystems and their local species and to promote their sustainable management, restoration and conservation. National Target 9: By the end of 2020, about 1,000 square km of desertified shrub land and grassland have been restored.	SDG 6 Clean water and sanitation	SDG 6. Ensure availability and sustainable management of water and sanitation for all.	6.6: By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes
		SDG 14 Life below water	SDG 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development.	14.5: By 2020, conserve at least 10% of coastal and marine areas, consistent with national and international law and based on the best available scientific information.
		SDG 13	SDG 13. Take urgent action to combat climate Change.	13.2: Integrate climate change measures into national policies, strategies and planning 13.3: Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning
		SDG 15 Life on Land	SDG 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.	15.1: By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements. 15.2: By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally. 15.3: By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world.

				15.5: Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species

Aichi Targets	National Biodiversity Targets	Primary SDGs	Secondary SDG	SDGs Targets related to Biodiversity Targets
Aichi Target 8 Pollution reduced.	National Target 10: By the end of 2016, a national monitoring programme is established for identification of the main sources and diffusion paths of chemical and physical pollutants in the natural ecosystems and the effects of pollution on natural ecosystems. National target 11: By the end of 2018 environmental standards are issued and enforced for prevention and control of priority pollutants in the natural ecosystems (not altered by human intervention).	SDG3 Good health and well-being.	SDG 3: Ensure healthy lives and promote well-being for all at all ages.	3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination
		SDG 6 Clean water and sanitation	SDG 6. Ensure availability and sustainable management of water and sanitation for all.	6.3: By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.
		SDG 9 Industry, innovation, and infrastructure.	SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.	9.4: By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities.

Aichi Targets	National Biodiversity Targets	Primary SDGs	Secondary SDG	SDGs Targets related to Biodiversity Targets
Aichi Target 11 Protected Areas	National Target 12: By the end of 2014, a regulation is issued for the establishment of protected areas in Iraq. National Target 13: By the end of 2014, at least three training workshops on protected areas. management have been conducted. National Target 14: By the end of 2016 a study and GIS maps of the most sensitive habitats (i.e. under high level of threats and containing high numbers of globally threatened species) have been developed. National Target 15: By the end of 2020, ten new protected areas have been gazetted and established.	SDG 6 Clean water and sanitation	SDG 6: Ensure the availability and sustainable management of water and sanitation for all.	6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes.
		SDG 8 Decent work and economic growth	SDG 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.	8.9: By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products.
		SDG 11 Sustainable cities and communities	SDG 11: Make cities and human settlements inclusive, safe, resilient and sustainable.	11.4 Strengthen efforts to protect and safeguard the world's cultural and natural heritage.
		SDG 14 Life below water	SDG 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development.	14.2 By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans. 14.5 By 2020, conserve at least 10% of coastal and marine areas, consistent with national and international law and based on the best available scientific information.
		SDG 15 Life on Land	SDG 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation and halt biodiversity loss.	15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements. 15.4 By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development.

Aichi Targets	National Biodiversity Targets	Primary SDGs	Secondary SDG	SDGs Targets related to Biodiversity Targets
Aichi Target 14 Ecosystem services	National Target 16: By the end of 2016, a national assessment is published of the state of provisioning, regulating and cultural services supplied by natural ecosystems and their importance for rural and urban people and on management options to be developed for the sustainable supply of ecosystem services. National Target 17: By the end of 2018 a national strategy/sub-national strategy are established for the sustainable management of ecosystems to supply important ecosystem services for rural and urban people.	SDG 1 No poverty	SDG 1: End poverty in all its forms everywhere.	1.4: By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance
				1.5: By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters.
		SDG 6 Clean water and sanitation	SDG 6: Ensure the availability and sustainable management of water and sanitation for all	6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all
		SDG 8 Decent work and economic growth	SDG 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.	8.4: Improve progressively, through 2030, global resource efficiency in consumption and production and endeavor to decouple economic growth from environmental degradation, in accordance with the 10-year framework of programmes on sustainable consumption and production, with developed countries taking the lead.
		SDG 14 Life below water	SDG 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development	14.7: By 2030, increase the economic benefits to small island developing states and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism.
		SDG 15 Life on Land	SDG 15: Protect, restore and promote sustainable use of terrestrial ecosystems,	15.9: By 2020, integrate ecosystem and biodiversity values into national and local planning, development

			sustainably manage forests, combat desertification and halt and reverse land degradation and halt biodiversity loss.	processes, poverty reduction strategies and accounts.

Aichi Targets	National Biodiversity Targets	Primary SDGs	Secondary SDG	SDGs Targets related to Biodiversity Targets
Aichi Biodiversity Target 9: Invasive alien species prevented and controlled.	National target 18: By the end of 2017, legislation is enacted to control the introduction and diffusion. of non-native species into the natural environment. National target 19 :By the end of 2020 the list of invasive species of Iraq and their impacts and invasion pathways have been published.	SDG 15 Life on Land	SDG 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation and halt biodiversity loss.	15.8 :By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species.

Aichi Targets	National Biodiversity Targets	Primary SDGs	Secondary SDG	SDGs Targets related to Biodiversity Targets
Aichi Biodiversity Target 12: Reducing risk of extinction	National Targets 20: By the end of 2020 the list of threatened species of Iraq has been published and an action plan for the conservation of priority species is produced. National Target 21: By 2020 legislation for the conservation of threatened species is issued and enforced.	SDG 14 Life below water	SDG 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development.	14.4: By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics.
			SDG 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation and halt biodiversity loss.	15.5: Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species.

Aichi Targets	National Biodiversity Targets	Primary SDGs	Secondary SDG	SDGs Targets related to Biodiversity Targets
Aichi Biodiversity Target 18: Traditional knowledge	National Target 22: By the end of 2020, a survey of indigenous and local communities' traditional knowledge, use and practices relevant for the conservation and sustainable use of biodiversity is published.	SDG 1 End poverty in all its forms everywhere.	SDG 1: End poverty in all of its forms everywhere.	1.4: By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance.
		SDG 2 Zero hunger	SDG 2: End hunger, achieve food security and improve nutrition and promote sustainable agriculture.	2.5 :By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed.
		SDG 5 Gender equality	SDG 5: Achieve gender quality and empower all women and girls.	5.5 Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life. 5.a: Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws.

		SDG 10 Reduce inequalities	SDG 10: Reduce inequality within and among countries.	10.2 By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status.

Aichi Targets	National Biodiversity Targets	Primary SDGs	Secondary SDG	SDGs Targets related to Biodiversity Targets
Aichi Biodiversity Target 20: Mobilizing resources from all sources	National target 23: By 2016 a Resource Mobilization Plan for implementation of the NBSAP is established and implemented.	SDG 15 Life on Land	Target 15.a: Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems.	15.a: Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems. 15.b: Mobilize significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation.
		SDG 17 Partnerships for the goals	SDG 17: Strengthen the means of implementation and revitalize the global partnership for sustainable development.	17.3 :Mobilize additional financial resources for developing countries from multiple sources.

Section V. Description of the national contribution to the achievement of the targets of the Global Strategy for Plant Conservation

(completion of this section is optional)

Although Iraq has no national targets for the GSPC targets, there are a number of achievements, which are as follows:

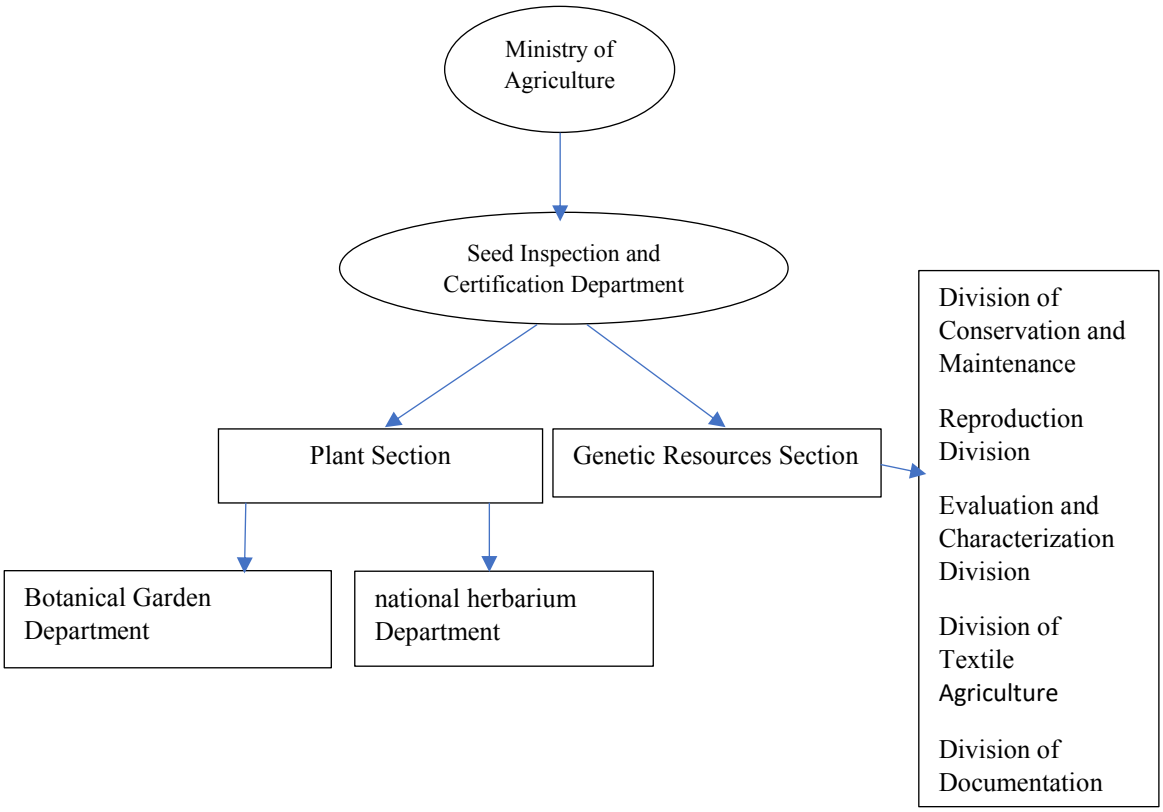
1. Collecting plant genetic resources (e.g. seeds) for wild and cultivated species (as well as medicinal specimens) are stored in a gene bank. This resource is used for the identification of plant species both in terms of monitoring distribution, for example to assess changes in rarity status and invasive species.
2. Preservation of wild and cultivated genetic resources in the plant genetic bank of the Ministry of Agriculture Seed Inspection and Certification Department / Genetic Resources Department and conducting biochemical, germination and seed health tests on a regular basis.
3. Evaluating and characterizing wild and cultivated plant species and preparing the data and making it available to plant breeders to benefit from the desired traits in wild species and to contribute to their use besides food security.
4. To collect plant genetic resources from all regions of Iraq, as well as to evaluate the vegetative status and the spread of plant species and to study their presence and the threats that affect the spread of species and try to protect them from genetic erosion.
5. Holding scientific seminars about the botanical value of Iraq to promote the benefits of economic and cultural values of this resource.
6. Publication of some studies, books and research on plant wealth, genetic diversity and invasive alien species (e.g. Illustrated Flora of Lowland of Iraq) which contribute to the identification of plant species, including endangered species through the attached images. In addition, the Flora Encyclopedia of Iraq (in cooperation with the British Royal Gardens in London) deals with plant diversity in Iraq, including endangered species and gives details of scientific classification, local name and the habitats they inhabit.
7. Cultivation and adaptation of plant species in general, and trees and shrubs in particular, in the (Zafaraniya Botanical Garden), which is affiliated with the Seed Inspection and Certification Department / Botany Department, which is a living museum of plant species and a center for the preservation of biodiversity in the plant.

Network information on plant conservation:

1. Genetics and Genetic Resources Department / Seed Inspection and Certification Department /Ministry of Agriculture, where about 2,800 genetic inputs are stored in the form of seeds and within the international standards of gene banks. The Gene Bank is the only centre in Iraq that conserves, evaluates, renews and documents genetic assets,
2. The Botanical Garden is a scientific research centre for the protection and propagation of plant genetic resources living outside its original habitat. The Botanical Garden preserve a large number of plant species, most of which are medicinal plants and can be studied and their role in medicine, for example, can be explored.

Other Information:

1. Develop annual plans related to the procedures for studying and protecting botanical biodiversity and approving national projects related to genetic resources with the support of the Ministry of Agriculture (for example, the Bank of Genetic Resources Project). In this regard we would like to show the formations of the Seed Inspection and Certification Department / Ministry of Agriculture concerned with maintaining botanical biodiversity of the plant. With the following scheme



2. The National Strategy for Biodiversity for the years 2015-2020 is a comprehensive and effective plan for the protection and sustainability of wildlife
3. Declaration of protected areas some of which are protected under global legislation, represents an achievement in the protection of plants and their genetic resource. This was undertaken in cooperation with the National Commission for Natural Conservation.
4. A study on exotic invasive plant species in Iraq was prepared.
5. Research and studies on rare or endangered plant species have been published and work is continuing on the completion of the Iraqi Encyclopaedia of Plants.
6. Lack of financial allocations is the main obstacle that hinder the achievement of these plans.

Section VI. Additional information on the contribution of indigenous peoples and local communities

(completion of this section is optional)

Contributions of local communities are included in the other Sections.

Section VII. Updated Biodiversity Country Profile

Updated biodiversity country profile

Biodiversity facts

Status and trends of biodiversity, including benefits from biodiversity and ecosystem services and functions:

Iraq is a part of the Palearctic region, the largest of the eight-terrestrial biogeographic ecozones that have been classified on earth. The World-Wide Fund for Nature (WWF 2018) assigned five terrestrial biomes and nine ecoregions in Iraq, where five (Zagros Mountain Forests-steppe; Middle East Steppe; Mesopotamian Shrub Desert; Tigris-Euphrates alluvial salt marsh; Arabian Desert and East Sahero-Arabain Xeric Scrublands) account for 96% of the total area of Iraq. Three freshwater ecoregions, the Arabian Interior, Lower and Upper Tigris and Euphrates River basins, and one Arabian Gulf marine ecoregion were also identified in Iraq. Therefore, Iraq has a range of different habitats and an accompanying range of biodiversity *(KBA report ,2017).*

The country can be divided roughly into four geographic zones: the rocky and sandy desert of the west and south-west; the mountains, hills, and steppes of the north and north-east, along the Turkish and Iranian borders; the hills and plains south of that region; and the marshy lowlands. In the north the mountaintops reach 3,600 meters; in the far south the land is barely above sea level. Two great rivers run from north to south: the Tigris (1,418 kilometers in Iraq) and the Euphrates (1,213 kilometers). They join near al-Qurna and form the Shatt al-Arab a river 185 kilometers long. The desert region in the west and south-west is part of the Syrian Desert, which also covers large parts of Syria, Jordan, and Saudi Arabia.

One thousand three hundred and sixty-four species have been assessed so far on the IUCN Red List of Threatened Species that are linked with Iraq *(https://www.iucnredlist.org/)* Seventeen mammal species out of 103 listed as threatened (18% threatened in Iraq) are categorized as Critically Endangered, Endangered or Vulnerable. Seventeen bird species out of 409 (5% threatened in Iraq) were categorized as Critically Endangered, Endangered or Vulnerable. Five out of 81 species of the reptiles and amphibians are listed as Threatened (6% threatened in Iraq). A total of 311 fish (23 from the class: Chondrichthyes & 288 from the class Actinopterygii) from Iraq are listed as threatened species (7% threatened in Iraq). Two hundred and fifty-two plant species have been recorded in Iraq, two species are listed as Threatened both as 'Endangered'. The proportion of species in Iraq, which were classified as declining, are fewer than the global average (i.e. fewer species are declining in Iraq relative to the global average).

Coral reefs are one of the most vulnerable ecological habitats in Iraqi waters and are located within a narrow strip (58 km) of the northern coast of the Arabian Gulf. These reefs are adapted to one of the most extreme coral-bearing environments and have witnessed extensive historical impacts from a number of significant environmental, climatic, and human stressors.

Only around 1.4% of the land area of Iraq is forested. The total area of arable lands is (32.6% of total land), and the cultivated land is (27% of the arable land), desertified land area in Iraq was identified as (15.3% of total land area), with (3% of land area) categorized as sand dunes with frequent occurrences of dust and sand storms in the middle and south of Iraq. 70% of the land deterioration trends by sand dunes was notified within 10 years after 2006[8]. The extent of desertified land in KRG is small compared to the rest of Iraq because most of the territory of Kurdistan is located in areas of high rainfall (relative to other parts of the country).

The agricultural sector in Iraq consumes 85% of the total surface water demand. Iraq is directed to the use of modern technology in irrigation (to reduce water demand). However, in Ministry of agriculture plan, there is an increase in the production of wheat and barley for 2018 by 40% and of dates by 20% compared with 2013 which will increase demand for water. Also, both animal and fish production have increased at an annual rate of between 2-5% between 2013-2018 as well.

The aquaculture sector in Iraq witnessed a notable increase following the issuance of regulatory controls under the legal framework for the development of the fish farming on Iraqi water bodies using the floating cages system as well as the closed system. The aim of this sector is to meet the local market demand for fish meat and to reduce the pressure of fishing in Iraq, in addition, to protect populations of fish species from being depleted.

Main pressures on and drivers of change to biodiversity (direct and indirect):
Iraq faced many direct and indirect pressures as a result of human interventions:
the Government of Iraq was forced to divert attention and resources towards the war against ISIS which delayed the implementation of the strategies and plans of the main sectors (such as environment and agriculture), especially in three provinces which cover 45% of the total area of Iraq (Nineveh, Anbar and Salahuddin).

Fauna and Flora species were linked to a wide range of threats as presented in the IUCN Red List of Threatened species including: development activities; pollution; climate change and severe weather; drought; floods; over-exploitation; invasive and alien species; genes and diseases. The top three threats impacting on the 648 species in Iraq linked with threats were: "Pollution", "Biological Resource Use" and "Residential and Commercial Development". One particularly prominent issue facing ecosystems and biodiversity in Iraq is water scarcity. This problem is a result of: (i) upstream dams substantially reducing river water from upstream countries; (ii) internal water management problems; and (iii) climate change.

Iraq has reported increases in the mean temperature by 1.5-2.5 °C in the period between 1941 to 2009*).* There have also been reductions in rain precipitation between the past and present in Iraq between 1941-2009 which showed a reduction in annual mean rainfall from 550 mm to 200mm in Northern Iraq and from 250mm to 75mm in Southern Iraq. The report to the UNFCCC (2015) highlighted the south of Iraq, including the coastal area surrounding Basra city, to be the most exposed to climate change (*Source*: *Iraq's 1st national communication to the UNFCCC 2015(.*

Given these results, the ecosystems in the south of Iraq, including the coastal area and marshlands and their associated biodiversity, are the most vulnerable to climate change which may lead to extensive habitat loss, and the potential to transform to a novel regime. Climate change significantly impacts the existence of species as a result of water scarcity such as Smooth Coated Otter *Lutrogale perspicillata maxwelli* and Basra Reed Warbler *Acrocephalus griseldis*.

Water scarcity, overfishing and pollution have affected the quality of fresh water, leading to the threat of fish species endemic in Iraq, such as *Bunni, Shaboot Gittan* and other endemic fishes and replaced by exotic fish such as *Hemiculter leucisculus* and *Poecilia latipinna*.

Knowledge about the impacts of alien or invasive species in Iraq are restricted to case studies. For example, the numbers of exotic and marine species recorded in the Shatt Al-Arab River has increased recently and this has been linked with reductions in water flow as a result of the decline in rate of discharge of freshwater (e.g. due to upstream dams). The most abundant exotic species in the river were *Carassius auratus*, *Oreochromis aureus* and *Coptodon zillii*.

Deforestation in northern Iraq is due to the severe conditions created by successive wars, and its impacts on biodiversity with threats to a range of species. In addition to the above, overgrazing, land exploitation, excessive hunting, unplanned development urbanization plays a major role in the loss of natural habitats.

Measures to enhance implementation of the Convention

Implementation of the NBSAP:

Iraq has adopted 23 national biodiversity targets (in the national biodiversity strategy and action plan (NBSAP) 2015-2020) and 34 Programs (actions) that are linked to nine Aichi Targets. The NBSAP implementation did not match totally the steps or the mechanism set in the strategy document because Iraq has witnessed significant political, economic and security events in the years following adoption of the NBSAP. Despite the lack of funding in the implementation of the NBSAP and the deteriorating security conditions in some areas of Iraq since the 5th National Report, implementation has continued and achieved results although less than planned. The main constraints to implementation were linked to financial, administrative and legal issues that impacted on field-work with widespread security issues in Iraq that hindered the movement of the team at that time. In addition, the issue of coordination and cooperation mechanisms between different stakeholders on the implementation of the strategy and inadequate capacities in the monitoring and reporting.

In the 6NR progress towards the implementation for ten NBTs was reported to be at an insufficient rate. This lack of progress was attributed to multiple challenges: 1) the security condition in the governorates under conflict that restricted the ability to conduct biodiversity surveys; 2) lack of coordination and cooperation mechanisms amongst stakeholders; 3) Need more interest by decision makers about biodiversity; 4) insufficient government

funding for NBSAP implementation; 5) limited time given to achieve targets; 6) shortage of information to fulfill the target requirements (e.g.: traditional knowledge assessment); 7) lack of technical expertise.

While two targets show (no significant change) as of limited expertise to achieve the target as the time given to achieve the target was limited (e.g. establish resource mobilization plan and ecosystem services assessment respectively).

Eleven NBTs were reported as progress (on track) towards achieving them, which are attributed to three main factors. First, the joint effort between the Ministry of Health and Environment and Iraqi NGO (Nature Iraq) in conducting the major survey of Key Biodiversity Areas (KBA) in Iraq (published in 2017). This survey covered a wide range of information on monitoring and evaluation of 82 Key Biodiversity Areas with data then entered into a GIS database. Second, the progress Iraq achieved in protected area designation and the capacity building efforts supported by the concerned authorities. Third, developing relevant biodiversity related legislation by nominated national and technical committees from different stakeholders. Fourth, the increasing evidence base in the scientific literatures about biodiversity in Iraq since 2014.

Overall actions taken to contribute to the implementation of the Strategic Plan for Biodiversity 2011-2020:

1. The NBSAP targets have been set within the framework of global biodiversity strategy and has committed Iraq to 23 national biodiversity targets which are linked directly to both Aichi Targets and Sustainable Development Goals. Biodiversity is mainstreamed in the national Strategies and Plans as follows: a) Poverty reduction strategy (2018-2022); b) National Environmental strategy (2013-2017); c) Strategy of water resources and land management strategy (2015-2035); d) Integrated National Energy Strategy; e) Ministry of Agriculture strategic plan (2015-2025), f) National Development Plan (2018-2022).

2. There is a strong commitment to form a network of protected areas in Iraq. Iraq has protected 1.53% of its land through 23 protected areas (*https://www.protectedplanet.net/)* Five sites have so far been formally designated and 18 are in the process of formal ratification. There are a further 82 key biodiversity areas reported in 2017 that are potential future protected areas. The survey reported areas of habitat, site maps and recommendations for effective conservation. The area represented by the 82 sites comprises 6.5% of the total area of 28,388 km2 of the country and covers a variety of habitat types. Examples of particular protected areas include the following: in 2014, the Central Marshes was nominated by the Iraqi government as Iraq's first National Park, and along with four other sites (Al-Hammar Marsh, Central Marshes, Hawizeh Marsh and Sawa Lake) it was declared as a Ramsar site; in 2015, two sites (Teeb and Dalmaj) were to be as GEF funded Pilot Project for Protected Areas sites in Iraq. In 2016, a valuable achievement for the Government of Iraq was made by nomination of the southern Mesopotamian Marshes as a UNESCO World Heritage site based on its natural, cultural, and archaeological significance.

3. For the control on alien invasive species key achievements included: updating the list of alien and invasive species based on the recent published literature and drafting a regulation to control the presence and circulation of invasive alien species by a technical committee of relevant ministries and institutions. Legislation on this topic is currently in the process of being adopted.

4. Iraq ratified the convention on climate change UNFCCC in 2009 and since then important measures have been taken to reduce impacts of climate change. For example, the country enhanced its policies and suggested, according to the Paris climate agreement, 14% of the business as usual (CO_2eq) will be mitigated between 2020 and 2035*(Source: iNDCs ,2015)* Specific more localized actions have also been taken. For example, carbon stocks in the marshlands in the south of Iraq are substantial and, partly for this reason, the government declared the Central Marshes as the first national park and RAMSAR site.

5. Many steps have been taken in the aquaculture sector in Iraq because the population started to depend on aquaculture for protein consumption, so this will reduce the impact of the threat on the wild - caught fish. A notable increase in aquaculture was noted (compared with the preceding years) following the issuance of regulatory controls for the development of the fish farming sector on the Tigris, Euphrates, Marshlands

6. and other water bodies using the floating cages system as well as the closed system. A significant increase in the area of fish farming by 1.5% (compared between 2013 and 2018), an increase is noted in the fish breeding cages volumes for the last two years*(source: MoA)* In addition, to protect populations of fish

species from being depleted, a new regulation No 2 of 2017 was issued about the control of fishing in the marshes and exploitation of aquatic related to this specific Key Biodiversity Area.

Support mechanisms for national implementation (legislation, funding, capacity-building, coordination, mainstreaming, etc.):

1. **Legislation**

In Iraq, including KRG, several laws and legislation have been developed which outline a comprehensive framework of principles for the protection of Iraq's environment and biological diversity. NBSAP adopted six National Targets that deal with legislation and policies with nine actions derived from these targets on the following areas: a) protected areas establishment; b) forestry; c) control on non-native species; d) environmental standards and limits of pollutants; e) conservation of threatened species; f) Ecosystem services strategy for urban and rural people; g) desertification and land protection; h) guidelines for sustainable use of natural resources.

Progress have been made to achieve these targets. Iraq has a solid base of legislation to protect and use natural resources in a sustainable manner. Key progress has been through the issuing of a law on Protected Areas in 2014 and through a number of different legislation about biodiversity conservation both nationally and more locally (e.g. focused on the marshes in the south of Iraq). Other legislation has also been focused on reductions in desertification, protection of threatened species, control on non-native species. These have been drafted by technical committees and are in the process of final adoption. To contribute to the global environmental protection effort, the Government of Iraq has ratified a number of conventions from 2009 onwards, for example the UNCBD, UNCCD, UNFCCC, CITE, CMS, RAMSAR, World Heritage Convention, the International Treaty on Plant Genetic Resources for Food and Agriculture and the Cartagena Protocol on Biosafety to the Convention on Biological Diversity, Minamata on chemicals management, Basil convention for hazardous waste. Iraq is therefore responsible for monitoring compliance to these international conventions

2. **Logistical/financial issues**

Many drivers contributed to insufficient government funding for comprehensive implementation of the NBSAP such as the war on terror (and the subsequent resources needed to rebuild areas of damaged infrastructure) and relative lack of interest in biodiversity by decision makers. There is a Resource Mobilization Strategy (2015-2020) *(http://www.biodiv.be/iraq)* which highlights the critical needs, the main gaps and a general set of actions needed to finance (both internationally and nationally) the NBSAP actions in the 5-year period 2015-2020. This plan needs urgent support from the international and national communities.

3. **Awareness of biodiversity and associated issues**

There were **seven** actions in the NBSAP focused on increasing awareness about biodiversity: capacity building targeted different groups in different fields of biodiversity (technical, academic, decisions makers, related stakeholders); five actions to carry out surveys to understand the level of knowledge about biodiversity, ecosystem services ,traditional knowledge, protected areas, ecotourism, habitat loss and threated/extinct species . The outcomes of these actions showed that knowledge about biodiversity and ecosystem services was relatively low among the public in both rural and urban areas. Knowledge of these issues was variable among government employees and students in universities. More effort is needed to increase awareness about biodiversity and the relative lack of progress is attributed to constraints previously mentioned about NBSAP implementation.

Mechanisms for monitoring and reviewing implementation:

The main actors in the field of biodiversity monitoring are the MoHEnv in cooperation with the relevant authorities. Monitoring programs to control pollutants in all governorates of Iraq exist but require updating to ensure compliance with acceptable levels using internationally recognized threshold levels. The role of the environmental police in the federal government and the Kurdistan Regional Government operates to enforce the law to control overfishing, overhunting, exploitation, as well as logging in the Kurdistan Region. Despite the backdrop of security issues and challenges for the Iraqi government the country has made good progress in setting up a Protected Area network. The numbers of sites designated, in the process of ratification and candidate sites are presented in this report.

Voluntary nature organizations, NGOs and researchers play a critical role in biodiversity monitoring as source of collectors of monitoring data, the use of websites was increased for publishing the monitoring reports on species. The surveying of 82 KBA sites (reported in 2017) and the doubling of evidence in the scientific literature about biodiversity in Iraq (since 2014) are noteworthy contributions.

There is a need for a national level to increase the capacity in the following areas: training in the use of spatial presentation and analysis, appropriate statistical analytical capacity, methods in monitoring, biodiversity indicators, integration of information between different areas (e.g. agriculture, water quantity and quality, biodiversity, carbon capture etc.) and measuring ecosystem services (including natural capacity). Increasing capacity in these areas will enable stakeholders to produce higher quality evidence-based policy and evidence-based assessment reports.

Stakeholders engagement in Iraq's 6th National Report development

The CBD defines stakeholders as people, groups, institutions, or organizations with an interest in, or influence on, biodiversity. A wide multi-sectoral group of stakeholders were involved in the various stages of the 6th National Report development process in Iraq to ensure their ownership of the 6NR development process. The stakeholders originated from a wide range of different stakeholder positions/sectors and due consideration of gender consideration was given. Details to support these statements is presented below.

1. A Steering committee for the 6NR project was been established after the project launching event in March under the leadership of the CBD focal point /Deputy Minister of (MOHEnv), during the 1st meeting on 24th April 2018. The steering committee agreed on a list of project stakeholders which included national experts/authors who have the responsibility of compiling information, analysing data for the 6NR development in coordination with supporting team from related Ministries, institutions, academia and NGOs, and under the guidance of the UNDP technical team. All stakeholders have knowledge on Iraq's natural history, resource management, policies concerning biodiversity management, and partly populated with those involved in the production of the NBSAP and previous national biodiversity reports thus ensuring good linkage with earlier work. Gender was considered in the nominated stakeholder groups, with involvement (in experts and supporting team) at the rate of 30% (of women).

2. UNDP hired a technical team comprised of one international and one national expert who lead the process under the supervision of UNDP 6NR Project manager. All were responsible for technical preparation and drafting of the final report in line with the CBD guidelines and to the satisfaction of the steering committee. The UNDP team organized the below mentioned workshops, trained the stakeholders to ensure their best engagement in 6NR development, and held numbers of consultative face-to-face meetings with the experts group during the development stages of the report, the experts group liaised with the supporting team for the required data and information, most communications between all mentioned teams held also via emails, mobile calls, SMS on a regular basis.

3. Stakeholders were engaged during 6NR development through the steps shown in Table (A) below

Table (A) Stakeholders kind of engagement in 6NR

Steps of Stakeholders engagement	kind of engagement	Engagement tools	participation
Pre-consultations to provide extra capacity support	1-Stakeholders were involved in SC meetings, their roles and responsibilities were identified in the 1st meeting, following up on 6NR development was discussed in the 2nd meeting. 2-The stakeholders were trained on the development of 6NR, understand the report format requirements on progress towards achieving national targets and changes in the status and trends of biodiversity, technical guidance on stakeholder engagement with gender inclusion.	SC meetings (in April and Nov2018) 1st technical workshop held on June 2018	Experts group with decision makers in MoHEnv All experts and supporting team
Consultations to obtain information on the national targets	Stakeholders agreed on 6NR working Plan determining kind of information each stakeholder can contribute and which stakeholders should be consulted for different National targets.	1st technical workshop	All experts and supporting team
Consultations at the national and sub-national level	1-The Stakeholders compiled the data in coordination with key Ministries and agencies for 6NR reporting zero draft. 2- Analysis 6NR zero draft, identifying the gaps in the information, provided feedback on how to fill gaps. 3- 1st 6NR draft submitted to the technical peer review from the global team.	Six consultative meetings held between UNDP team and experts' group (July – November 2018) Separate meeting with Kurdistan region related Agencies (Oct 2018) Stakeholders consultation workshops held in Nov 2018	Experts group UNDP team, and KRG /EPIB All stakeholders
Peer and technical review processes	Special comments and recommendations were reviewed by stakeholders to amend the first draft of the report	Two meetings held with the expert groups	Experts Group
Dissemination of final 6NR report and findings	The final draft was adopted by Stakeholders, related Ministries then submitted to CBD.	Consultative meeting with Experts Groups to response on Technical review recommendations, the report was submitted on time agreed by UNDP GEF.	All stakeholders
Follow up activities,	One -Day event to review the 6NR results, challenges, lessons learned, review the recommendations based on the 6NR findings for the future plans on Biodiversity conservation and development in Iraq.	Proposed 6NR launching event on September ,2019	All stakeholders with decision makers participation

4. Representatives from the stakeholders listed in the Table (B) below were engaged in the 6NR report development and participated in Project workshops.

Table (B) Stakeholders representatives and their related institutions

Stakeholder's agencies		Related institution
Government	MOHEnv	Technical directorate, Department of Marshland and natural ecosystem
	MOHEnv	Department of the International relation affairs.
	MOHEnv	Environment directorates in the north, middle and south governorates
	MOHEnv	Adviser on Biodiversity
	MoWR	Marshland restoration center
	MoA	Directorate of Forestry and Desertification, Directorate of following up and planning
	MoP	Central Statistics Organization
	MoHESR	University of Baghdad, University of Basra, University of Mustansiriya University of Anbar, University of Mosul, University of Diyala, Al Qasim University.
	International conventions and agreements national focal points	Focal points of CMS, CITES, IUCN, Cartagena protocol)
Civil Society /NGOs	NGOs	Nature Iraq, Iraqi Green Climate organization, Chabaish Organization for Ecotourism, Nature Conservation Organization
Regional Government	KRG	Environment protection and improvement Board
International Organizations	UN agencies	FAO, UNESCO

5. The Stakeholders were divided in three groups (headed by the experts) each group assisted in collecting data based on their interests, expertise, and ability to provide qualitative and quantitative data on relevant targets. Each group was requested to fill 6th NR template(identified by the Convention on Biodiversity and available at (https://www.cbd.int/reports/) with appropriate data and information on measures taken to contribute to the implementation of the National Biodiversity Strategy and action plan (2015-2020), provide information on the effectiveness of actions and associated obstacles and scientific / technical needs, assessment of progress towards each national target (using the global and/or national indicators of biodiversity status and trends). All stakeholders are involved in drafting the national contributions to Aichi Targets.

Table (C) Stakeholders engagement by reporting area.

Group	Representatives from Ministries and agencies involved	Engagement in reporting on the National Targets and related Aichi Targets
A	MOHEnv, MOWR, Universities, MoP, NGOs, Environment directorate in governorates, KRG	- Awareness (National Targets 1,2,3,4) -Pollution (National Targets 10,11) -Protected areas (National Target13,14,15)
B	MOHEnv, MoA, NGOs, Environment in governorates, KRG	-Habitat loss (National Targets 16,17 -desertification and Forestry (National Targets (7,8,9) -Invasive alien species (National Targets 18,19)
C	MoHEnv and, Environment directorates in governorates MoWR, MoA, MoP, Academic, NGOs,	-Ecosystem service (National target 16,17) -Traditional Knowledge (National target 22) -Threatened species (National targets 20,21) -resources mobilization (National Target 23)
D	All Stakeholders	National contribution to Aichi Targets

6. More coordination between stakeholders and UNDP team for the other sections of the report also took place.
7. The participation of women as stakeholders was one of the successful aspects of the entire process of the sixth national report. This engagement process was encouraged at a range of levels, including within the Steering Committee, experts and support groups, to assist in the collection of updated information for each target in collaboration with key ministries to prepare draft zero of the report, and to respond to the relevant ministries' recommendations / inputs on the final report draft, as well as the international technical peer review team in charged with reviewing the report draft. Women also served as facilitators and lecturers in project workshops

(see the 6NR last page, photos taken in workshops and meetings).

Box 1 Identify Headline figures for female engagement in the 6th NR process.

*The (30) stakeholders engaged in 6NR development, included 11 women with the rate of 36% .

* A total number of participants (60) were involved in two workshops of which 40% of participants were female.

*MoHEnv working team in marshland and ecosystem resources department was mainly engaged with the 6NR development, include 5 female and 4 males.

Females from related Ministries and agencies were involved in the implementation of NBSAP measures specifically in the initiation new legislation for the following topics.

Table (D). Technical committees contributing in drafting legislation with women participation rate.

Topic of legislation Regulations	Total number of people on committee	Number of women
Regulation on combatting desertification	13	6
Regulation on Threatened species	9	2
Regulation on Invasive /Alien species	13	6
Regulation on ecotourism in Marshland	18	5
Regulation on the national Parks	13	3
Total	66	22 (33% rate of participation)

Annexes

Annex No. 1

List of Publications and communication links of related Ministries and NGOs

numbers	Awareness Tools	agency	link	Topic
8	Education Programs	Ministry of Health &Environment	https://www.youtube.com/watch?v=asr8D9RMlkU https://www.youtube.com/watch?v=Ko0wk8xwEeQ https://www.youtube.com/watch?v=uYLg-LyaxgM https://www.youtube.com/watch?v=bjILTfvpCAU https://www.youtube.com/watch?v=6mNcLuNeCys https://www.youtube.com/watch?v=QVDw--b4Pn8 https://www.youtube.com/watch?v=cCTv_i8b56E https://www.youtube.com/watch?v=EcgvmQ3OMZA	*Environment and life (TV program)
4	Video	Nature Iraq	https://www.youtube.com/watch?v=FdRtIs_AhXw&feature=youtu.be http://www.natureiraq.org/news/an-environmental-awareness-project-has-been-done http://www.natureiraq.org/project-videos.htm http://www.natureiraq.org/videos--page-2.htm	Marsh Arabs of Southern Iraq Environment awareness project/ Water keeper advocacy project NI projects and activities
2	Training course	Nature Iraq	http://www.natureiraq.org/news/the-second-capacity-building-training-course-for-the-ngos-to-manage-awareness-raising-campaign http://www.natureiraq.org/education-and-public-awareness.html	NGOs capacity building on Awareness raising Campaigns Training course press release
5	Report	Nature Iraq	http://www.natureiraq.org/news/funding-conservation-projects-a-voice-for-biodiversity-in-iraq http://www.natureiraq.org/objectives.html http://www.natureiraq.org/news/gifts-from-advocacy-project-to-the-primary-schools http://www.natureiraq.org/waterkeepers-iraq.html http://www.natureiraq.org/news/updates-from-the-waterkeeper	Conservation Project /A voice of Biodiversity in Iraq KBA Project Gifts from Advocacy Project to Primary Schools Water Keeper Project Updates from Water Keeper
6	Newsletter	Nature Iraq	http://www.natureiraq.org/literature.html	Newsletter (advocacy Project)

1	Press Release	Nature Iraq	http://www.natureiraq.org/news/press-release-the-waterkeeper-law-and-advocacy-project	Press Release
1	photos	Nature Iraq	http://www.natureiraq.org/news/awareness-activity-jensen-project	Photos
1	Event	Nature Iraq	http://www.natureiraq.org/news/world-wildlife-day-event-upcoming-on-march-3rd-in-sulaymaniyah	Event
16	Video	Iraqi Green Climate Organization	https://www.facebook.com/IraqiWildlifeCenter/videos/701345823383251	Video of invasive fish to Marsh
			https://www.facebook.com/100006580873657/videos/2140325922863416	Endangered bird in Marshes
			https://www.facebook.com/100006580873657/videos/2114220572140618	Releasing of Lutra lutra
			https://www.facebook.com/IraqiWildlifeCenter/videos/715028635530659/	Awareness on Wildlife targeted students
			https://www.facebook.com/ghibais/videos/703595773330275/	Survey to Marshland
			https://www.facebook.com/mahdiilaith/videos/788439714837579	special species of reptiles in Iraq
			https://www.facebook.com/IraqiWildlifeCenter/videos/487513611764365	(Al Hurrah) Iraqi Satellite channel reportage on NGOs
			https://www.facebook.com/IraqiWildlifeCenter/videos/681244942060006	Endangered species (Lutra lutra)
			https://www.facebook.com/mahdiilaith/videos/268258850545373	Value of (Keeled Rock Gecko)
			https://www.facebook.com/IraqiWildlifeCenter/videos/634289610088873	Over hunting of The Eurasian hoopoe
			https://www.facebook.com/mahdiilaith/videos/2331432037085132	smooth-coated otter surgery
			https://www.facebook.com/IraqiWildlifeCenter/videos/900470380137460	Fires in Al Heweeza Marshland
			https://www.facebook.com/IraqiWildlifeCenter/videos/841222416062257	Releasing Serbian Griffon Vulture
			https://www.facebook.com/IraqiWildlifeCenter/videos/236878590306891	Rescue of the Endangered Euphrates Softshell Turtle
			https://www.facebook.com/IraqiWildlifeCenter/videos/810552222462610	The Endangered Persian Leopard in Basra-Iraq
			https://www.facebook.com/IraqiWildlifeCenter/videos/705981759586324	Water Lilies in Marshland

numbers	Awareness Tools	agencies	Link	Topics
12	Brochures	Ministry of Health &Environment	http://www.moen.gov.iq /6NR/Awareness	Instructions to Nature land targeted the visitors
			http://www.moen.gov.iq /6NR/Awareness	Impact of Biranna fish on Iraqi Environment
			http://www.moen.gov.iq /6NR/Awareness	Environmental Tourism and Natural resources
			http://www.moen.gov.iq /6NR/Awareness	Sand Storm in Iraq
			http://www.moen.gov.iq /6NR/Awareness	Biodiversity
			http://www.moen.gov.iq /6NR/Awareness	Forest Role in Environment Protection
			http://www.moen.gov.iq /6NR/Awareness	Climate Change
			http://www.moen.gov.iq /6NR/Awareness	Lutra lutra
			http://www.moen.gov.iq /6NR/Awareness	Houbara Bustard
			http://www.moen.gov.iq /6NR/Awareness	Biodiversity Benefit to Human
1	Brochures	Ministry of Housing and Municipality	http://www.moen.gov.iq /6NR/Awareness	The International Day of Biodiversity
1	Brochures	Ministry of Health &Environment /Middle Euphrates Directorates	http://www.moen.gov.iq /6NR/Awareness	Piranha Fish
1	Booklet	Ministry of Health &Environment /Middle Euphrates Directorate	http://www.moen.gov.iq /6NR/Awareness	Stop, Over Hunting
				Bird World
1	Brochures	Ministry of water Resources	http://www.moen.gov.iq /6NR/Awareness	Threat to Migratory birds
3	Brochures	Ministry of Agriculture	http://www.moen.gov.iq /6NR/Awareness	Project for the Development and improvement of forests and the planting of eucalyptus trees.2018
			http://www.moen.gov.iq /6NR/Awareness	Rehabilitation of Vegetation.2018
			http://www.moen.gov.iq /6NR/Awareness	Natural pastures in Iraq. 2018
9	Booklet		http://www.moen.gov.iq /6NR/Awareness	Protection of our Water Resources

		Ministry of Health &Environment /North Directorates	http://www.moen.gov.iq /6NR/Awareness	Ecosystem and Desertification
			http://www.moen.gov.iq /6NR/Awareness	Protect our Water Resources
			http://www.moen.gov.iq /6NR/Awareness	Environmental Pollution by Pesticide
			http://www.moen.gov.iq /6NR/Awareness	National Inventory on Birds
			http://www.moen.gov.iq /6NR/Awareness	Role of Women in Natural resources Protection and Environment Pollution reduction
			http://www.moen.gov.iq /6NR/Awareness	Dust Storm in Iraq, causes and treatments
			http://www.moen.gov.iq /6NR/Awareness	Be a friend to Environment
			http://www.moen.gov.iq /6NR/Awareness	Protection of Environment Awareness Booklet for Children
1	Booklet	University of Agriculture , Municipality and Environment in Kirkuk Governorate	http://www.moen.gov.iq /6NR/Awareness	New Technology on Planting Trees
5	Booklet	Ministry of Health and Environment	http://www.moen.gov.iq /6NR/Awareness	Flamenco Bird
			http://www.moen.gov.iq /6NR/Awareness	Asiatic Cheetah in Iraq
			http://www.moen.gov.iq /6NR/Awareness	Wild Goat /Endangered Species
			http://www.moen.gov.iq /6NR/Awareness	Euphrates Soft shell Turtle
			http://www.moen.gov.iq /6NR/Awareness	Goitred Gazelle is an asset
1	Booklet	Nature Iraq/Erbil	http://www.moen.gov.iq /6NR/Awareness	Mechanism on Establishing National Parks
1	Booklet	Ministry of water resources in coordination with Ministry of Education	http://www.moen.gov.iq /6NR/Awareness	Iraqi Marshlands

numbers	Publication	Agency	Link	Topic

1	Atlas	Ministry of Agriculture	http://www.moen.gov.iq /6NR/Awareness	Atlas of the Treasures of Natural Shrub Plants in the Iraqi Deserts
2	Guidelines	Ministry of Health &Environment	http://www.moen.gov.iq /6NR/Awareness	Guide to the CITES Agreement and trade-related species in Iraq
1	Study	Ministry of Health &Environment	http://www.moen.gov.iq /6NR/Awareness	Environmental Traditional Knowledge in Marshlands
1	Inventory	University of Dohuk	http://www.moen.gov.iq /6NR/Awareness	Endangered Plants of KRG

]

Conference Title	Agencies	Link	Topics
Conference on Genetics and the International Environment,2018	Ministry of Health and Environment, Society for the Conservation of Genetic Resources and Environment, Canadian Institute of Health Sciences, Palm Environment and Agriculture	http://www.moen.gov.iq /6NR/Awareness	1. Genetic resources and the environment 2. Biological diversity and genetic engineering 3 - Pure and applied sciences and their relationship to heredity and the environment 4 - Environmental Pollution and the risk of Industrial Development 5 - Environment and its relationship with food and human 6. Wealth and health of animals and plants 7. Modern treatments for conservation and conservation of genetic and environmental resources 8. The role of governmental and non-governmental institutions in preserving genetic and environmental resources and resources
The First International Environmental Science Conference ,2014	Ministry of Health and Environment		1-Pollution control 2. Waste management 3. Wastewater treatment 4. Assessment of contaminated sites 5. Environmental impact 6. Control of service and industrial activities 7. Environmental awareness and awareness 8. Environmental legislations 9. Natural disaster management 10. Climate change 11. Sustainable Development and Green Economy 12. Renewable energies 13. Biodiversity 14. Nature reserves and World Heritage sites 15. Radiation pollution 16. Biosafety
Conference on Environment and Climate Change,2018	Ministry of Higher Education and Scientific Research/ University of Baghdad		1. Water 2. Natural systems and biodiversity 3. Pollution 4. Health 5. Climate change (adaptation and mitigation)
Launching of Women for Safe and Green Iraq initiative (WfSGI),2018	Ministry of Health and Environment		1-Iraq's ongoing efforts for resilient recovery, and WfSGI initiative's participation 2-Water sector 3-Climate Change in Iraq 4-Clean Energy in Iraq and the role of WfGSI

***(Environment and life) is one of TV program presenting its program on Al Iraqi Sat Channel twice /week**

http://www.moen.gov.iq/ لمر مى برنامج لحياة والبيئة

Annex No. 2

List of National and International species endangered in Iraq.

(A)List of globally threatened mammal species in Iraq according to Al-Sheikhly ET AL. (2015), and IUCN red list of Iraq

Total of Globally threatened mammal species recorded in Iraq is 25 (4 En; 13 VU; 8 NT).

No.	Common Name	Scientific Name	IUCN Red list criteria
1	Mesopotamian Fallow Dear	*Dama dama mesopotamica*	Endangered (4-EN)
2	Long-tailed Nesokia	Nesokia *Nesokia bunnii*	
3	Blue Whale	*Balaenoptera musculus*	
4	Indian Ocean Humpback Dolphin	*Sousa plumbea*	
5	Mehely's Horseshoe Bat	*Rhinolophus mehelyi*	Vulnerable (13-VU)
6	Marbled Polecat	*Vormela peregusna*	
7	Smooth-coated Otter	*Lutrogale perspicillata*	
8	Wild Goat	*Capra aegagrus*	
9	Mouflon	*Ovis orientalis*	
10	Arabian Oryx	*Oryx leucoryx*	
11	Goitred Gazelle	*Gazella subgutturosa marica*	
12	Finless Porpoise	*Neophocaena phocaenoides*	
13	Dugong	*Dugong dugon*	
14	Lion*	*Panthera leo*	
15	Indo-Pacific Finless Porpoise	*Neophocaena phocaenoides*	
16	Asiatic Cheetah	*Acinonyx jubatus venaticus*	
17	Persian Leopard	*Panthera pardus saxicolor*	
18	Mediterranean Horseshoe Bat	*Rhinolophus euryale*	Neat Threatened (8-NT)
19	Pallid Long-fingered Bat	*Miniopterus pallidus*	
20	European Otter	*Lutra lutra*	
21	Striped Hyena	*Hyaena hyaena*	
22	Sand Cat	*Felis margarita*	
23	Euphrates Jerboa	*Allactaga (Paralactaga) euphratica*	
24	Asiatic Wild Ass*	*Equus hemionus*	
25	False Killer Whale	*Pseudorca crassidens*	

* these species may be extinct in Iraq.

(B)List of the globally threatened Birds of Iraq (Birdlife international 2018), and IUCN red list of Iraq

Total number of threatened birds species in Iraq is 43 (3 CR; 6 EN; 11 VU; 23 NT).

No.	Common Name	Scientific Name	IUCN Red list criteria
1	Northern Bald Ibis	*Geronticus eremita*	Critically Endangered (3-CR)
2	Sociable Lapwing	*Vanellus gregarius*	
3	Slender-billed Curlew	*Numenius tenuirostris*	
4	White-headed Duck	*Oxyura leucocephala*	Endangered (6-EN)
5	Egyptian Vulture	*Neophron percnopterus*	
6	Steppe Eagle	*Aquila nipalensis*	
7	Saker Falcon	*Falco cherrug*	
8	Basra Reed-warbler	*Acrocephalus griseldis*	
9	Pallas's Fish-eagle	*Haliaeetus leucoryphus*	
10	Red-breasted Goose	*Branta ruficollis*	Vulnerable (11-VU)

11	Lesser White-fronted Goose	*Anser erythropus*	
12	Marbled Teal	*Marmaronetta angustirostris*	
13	Common Pochard	*Aythya ferina*	
14	European Turtle-dove	*Streptopelia turtur*	
15	Great Bustard	*Otis tarda*	
16	Asian Houbara	*Chlamydotis macqueenii*	
17	Greater Spotted Eagle	*Clanga clanga*	
18	Eastern Imperial Eagle	*Aquila heliaca*	
19	Rustic Bunting	*Emberiza rustica*	
20	Socotra Cormorant*	*Phalacrocorax nigrogularis*	
21	Ferruginous Duck	*Aythya nyroca*	Near Threatened (23-NT)
22	Falcated Duck	*Mareca falcata*	
23	Little Bustard	*Tetrax tetrax*	
24	Dalmatian Pelican	*Pelecanus crispus*	
25	Eurasian Oystercatcher	*Haematopus ostralegus*	
26	Northern Lapwing	*Vanellus vanellus*	
27	Eurasian Curlew	*Numenius arquata*	
28	Bar-tailed Godwit	*Limosa lapponica*	
29	Black-tailed Godwit	*Limosa limosa*	
30	Curlew Sandpiper	*Calidris ferruginea*	
31	Great Snipe	*Gallinago media*	
32	Red Knot	*Calidris canutus*	
33	Black-winged Pratincole	*Glareola nordmanni*	
34	Armenian Gull	*Larus armenicus*	
35	Bearded Vulture	*Gypaetus barbatus*	
36	Cinereous Vulture	*Aegypius monachus*	
37	Pallid Harrier	*Circus macrourus*	
38	Red kite	*Milvus milvus*	
39	Red-footed Falcon	*Falco vespertinus*	
40	Bateleur	*Terathopius ecaudatus*	
41	Redwing	*Turdus iliacus*	
42	Meadow Pipit	*Anthus pratensis*	
43	Cinereous Bunting	*Emberiza cineracea*	

*** still uncertain Presence in Iraq**

(C)List of Globally threatened herpetofauna (Reptiles and Amphibians) in Iraq according to Al-Barazangy ET AL.2015, and IUCN red list of Iraq.

Total of Globally threatened reptile species recorded in Iraq is 11 (2 CR; 4 En; 3 VU; 2 NT).

REPTILES			
No.	**Common Name**	**Scientific Name**	**IUCN Red list criteria**
1	Hawksbill Turtle sub-species	Eretmochelys imbricata bissa	Critically Endangered (2-CR)
2	Leather back Sea Turtle sub-species	Dermochelys coriacea schlegelii	
3	Loggerhead Sea Turtle	Caretta caretta	Endangered (4-EN)
4	Green Turtle	Chelonia mydas	
5	Euphrates Softshell Turtle	Rafetus euphraticus	
6	Zebra Snake	Spalerosophis microlepis	
7	Olive Ridley	Lepidochelys olivacea	Vulnerable (3-VU)
8	Spur-thighed Tortoise	Testudo graeca ibera	
9	Egyptian spiny tailed lizard	Uromastyx aegyptia	
10	Caucasus Viper	Montivipera (Vipera) raddei kurdistanica	Near Threatened (2-NT)
11	Blunt-nosed viper	Macrovipera lebetina obtuse	

Total of Globally threatened Amphibian species recorded in Iraq is 2 (1 CR; 1 VU; 1 DD).

AMPHIBIANS			
	Common Name	**Scientific Name**	**IUCN Red list criteria**
1	Kurdistan newt	*Neurergus microspilotus*	Critically Endangered (1-CR)
2	Mountain Newt, Azerbaijan Newt, Lake Urmia Newt	*Neurergus crocatus*	Vulnerable (1-VU)

(D)List of globally threatened freshwater and marine fishes in Iraq according to fish base, and IUCN in Iraq

Total of Globally threatened freshwater and marine fishes recorded in Iraq is 59 (6 CR; 10 En; 20 VU; 23 NT).

No.	**Common Name**		**Scientific Name**	**IUCN Red list criteria**
1		Freshwater	*Caecocypris basimi*	Critically Endangered (6-CR)
2	Iraq blind barb	Freshwater	*Garra widdowsoni*	
3	Ganges shark	Marine	*Glyphis gangeticus*	
4	Mesopotamian barbel	Freshwater	*Luciobarbus subquincunciatus*	
5	Tigris loach	Freshwater	*Oxynoemacheilus tigris*	
6	Green Sawfish	Marine	*Pristis zijsron*	
7	Pointed sawfish	Marine	*Anoxypristis cuspidata*	Endangered (10-EN)
8	Winghead shark	Marine	*Eusphyra blochii*	
9	Devil fish	Marine	*Mobula mobular*	
10	Damascus Loach	Freshwater	*Oxynoemacheilus panthera*	
11	Whale shark	Marine	*Rhincodon typus*	
12	Great hammerhead	Marine	*Sphyrna mokarran*	
13	Zebra shark	Marine	*Stegostoma fasciatum*	
14	Ocellate Eagle Ray	Marine	*Aetomylaeus milvus*	
15	Longhead Eagle Ray	Marine	*Aetobatus flagellum*	
16	Scalloped Hammerhead	Marine	*Sphyrna lewini*	
17	Yarkon Bream	Freshwater	*Acanthobrama telavivensis*	Vulnerable (20-VU)
18	Shabout	Freshwater	*Arabibarbus grypus*	
19	Sandbar shark	Marine	*Carcharhinus plumbeus*	

20	Sand tiger shark	Marine	*Carcharias taurus*	
21	Hooktooth shark	Marine	*Chaenogaleus macrostoma*	
22	Granulated guitarfish	Marine	*Glaucostegus granulatus*	
23	Snaggletooth shark	Marine	*Hemipristis elongata*	
24	Spotted seahorse	Marine	*Hippocampus kuda*	
25	Great Seahorse	Marine	*Hippocampus kelloggi*	
26	Mangar	Freshwater	*Luciobarbus esocinus*	
27	Yellowfin barbell	Freshwater	*Luciobarbus xanthopterus*	
28	Binni	Freshwater	*Mesopotamichthys sharpeyi*	
29	Smoothnose wedgefish	Marine	*Rhynchobatus laevis*	
30	Arabian Scad	Marine	*Trachurus indicus*	
31	Smooth Hammerhead	Marine	*Sphyrna zygaena*	
32	Porcupine Ray	Marine	*Urogymnus asperrimus*	
33	Blotched Fantail Ray	Marine	*Taeniurops meyeni*	
34	Clubnose Guitarfish	Marine	*Glaucostegus thouin*	
35	Spotted Eagle Ray	Marine	*Aetobatus ocellatus*	
36	Kiss-lip himri	Freshwater	*Carasobarbus kosswigi*	
37	Scaly whipray	Marine	*Brevitrygon walga*	
38	Spinner shark	Marine	*Carcharhinus brevipinna*	
39	Whitecheek shark	Marine	*Carcharhinus dussumieri*	
40	Bull shark	Marine	*Carcharhinus leucas*	
41	Blacktip shark	Marine	*Carcharhinus limbatus*	
42	Blacktip reef shark	Marine	*Carcharhinus melanopterus*	
43	Spot-tail shark	Marine	*Carcharhinus sorrah*	
44	Yellowfin hind	Marine	*Cephalopholis hemistiktos*	
45	Arabian carpetshark	Marine	*Chiloscyllium arabicum*	
46	Grey bambooshark	Marine	*Chiloscyllium griseum*	
47	Duskytail grouper	Marine	*Epinephelus bleekeri*	
48	Orange-spotted grouper	Marine	*Epinephelus coioides*	
49	Spinycheek grouper	Marine	*Epinephelus diacanthus*	Near Threatened (23-NT)
50	Malabar grouper	Marine	*Epinephelus malabaricus*	
51	Smallscaled grouper	Marine	*Epinephelus polylepis*	
52	Tiger shark	Marine	*Galeocerdo cuvier*	
53	Long-tailed butterfly ray	Marine	*Gymnura poecilura*	
54	Cowtail stingray	Marine	*Pastinachus sephen*	
55	Narrow-barred Spanish mackerel	Marine	*Scomberomorus commerson*	
56	Indian Mackerel	Marine	*Rastrelliger kanagurta*	
57	Blue Shark	Marine	*Prionace glauca*	
58	Spotted Eagle Ray	Marine	*Aetobatus narinari*	
59	Pearly hairtail	Freshwater & Marine	*Trichiurus auriga*	

(E)List of Iraq's threatened plants (including endemic plants) according to Miller and Neale. (2015), and IUCN red list of Iraq.

Total of Globally endemic threatened plants recorded in Iraq is 99 (8 CR; 27 En; 57 VU; 6 NT).

No.	Scientific Name	IUCN Red List criteria
1	*Ferula shehbaziana*	Critically Endangered (8-CR)
2	*Pimpinella hadacii*	
3	*Onosma hawramanensis*	
4	*Hesperis novakii*	
5	*Cousinia qandilica*	
6	*Tulipa kurdica*	
7	*Himantoglossum hircinum*	
8	*Vicia singarensis*	
9	*Leutea rechingeri*	Endangered (27-EN)
10	*Arum hainesii*	
11	*Myosotis kurdica*	
12	*Cicer bijugum*	
13	*Astragalus acetabulosus*	
14	*Camelinopsis kurdica*	
15	*Achillea aleppica*	
16	*Anthemis hamrinensis*	
17	*Centaurea alveicola*	
18	*Cousinia acanthophysa*	
19	*Cousinia algurdina*	
20	*Cousinia carduchorum*	
21	*Cousinia inflata*	
22	*Crepis kurdica*	
23	*Staehelina kurdica*	
24	*Marrubium eriocephalum*	
25	*Astragalus chionobiiformis*	
26	*Astragalus dendroproselius*	
27	*Astragalus helgurdensis*	
28	*Astragalus leiophyllus*	
29	*Astragalus pseudofragrans*	
30	*Astragalus pushtashanicus*	
31	*Alchemilla kurdica*	
32	*Galium qaradaghense*	
33	*Rhynchocorys elephas*	
34	*Scrophularia atroglandulosa*	
35	*Verbascum arbelense*	
36	*Ferulago abbreviata*	Vulnerable (57-VU)
37	*Pimpinella kurdica*	
38	*Pimpinella nephrophylla*	
39	*Turgenia lisaeoides*	
40	*Heliotropium albo- villosum*	
41	*Heliotropium confertiflorum*	
42	*Onosma angustiloba*	
43	*Onosma qandilica*	
44	*Onosma striata*	
45	*Onosma sulaimaniaca*	
46	*Onosma wheeler-hainesii*	
47	*Hesperis blakelockii*	
48	*Paronychia mesopotamica*	
49	*Petrorhagia sarbaghiae*	
50	*Anthemis micrantha*	
51	*Anthemis plebeia*	
52	*Centaurea elegantissima*	
53	*Centaurea foveolata*	

54	*Centaurea fusiformis*	
55	*Centaurea gudrunensis*	
56	*Centaurea longipedunculata*	
57	*Cousinia mazu-shirinensis*	
58	*Cousinia odontolepis*	
59	*Echinops amoenus*	
60	*Echinops armatus*	
61	*Echinops candelabrum*	
62	*Echinops faucicola*	
63	*Echinops nitens*	
64	*Echinops rectangularis*	
65	*Pterocephalus laxus*	
66	*Eragrostis boriana*	
67	*Nepeta autraniana*	
68	*Scutellaria porphyrantha*	
69	*Stachys fragillima*	
70	*Stachys graveolens*	
71	*Stachys nephrophylla*	
72	*Thymus neurophyllus*	
73	*Allium calocephalum*	
74	*Allium notabile*	
75	*Bellevalia parva*	
76	*Eremurus rechingeri*	
77	*Fritillaria crassifolia*	
78	*Linum velutinum*	
79	*Astragalus baijensis*	
80	*Astragalus gillettii*	
81	*Astragalus sarae*	
82	*Astragalus zoharyi*	
83	*Vavilovia formosa*	
84	*Acantholimon astragalinum*	
85	*Pteropyrum noeanum*	
86	*Delphinium micranthum*	
87	*Asperula comosa*	
88	*Asperula friabilis*	
89	*Galium hainesii*	
90	*Scrophularia sulaimanica*	
91	*Parietaria rechingeri*	
92	*Vitis hissarica*	
93	*Bunium avromanum*	Near Threatened (7-NT)
94	*Pimpinella zagrosica*	
95	*Cousinia gigantosphaera*	
96	*Cousinia macrolepis*	
97	*Astragalus lobophorus*	
98	*Astragalus porphyrodon*	
99	*Carex iraqensis*	

(F)List of globally threatened invertebrate of Iraq according to IUCN red list of Iraq

Total of Globally threatened Anthozoa species recorded in Iraq is 40 (13 VU; 27 NT)

Total of Globally threatened insect species recorded in Iraq is 6 (3 VU; 3 NT).

No.	Scientific Name	IUCN Red list criteria
1	*Parnassius Apollo*	**Vulnerable (3-VU)**
2	*Brachythemis fuscopalliata*	
3	*Onychogomphus flexuosus*	
4	*Archon apollinus*	**Near Threatened (3-NT)**
5	*Gymnopleurus sturmi*	
6	*Libellula pontica*	

Total of Globally threatened bivalvia species recorded in Iraq is 3 (1 EN; 2 NT).

No.	Scientific Name	IUCN Red list criteria
1	*Unio crassus*	Endangered (1-EN)
2	*Anodonta vescoiana*	Near Threatened (2-NT)
3	*Leguminaia wheatleyi*	

(G)List of the national threatened vertebrate fauna of Iraq.

No.	Common name	Scientific name	IUCN status	National status/note	References
A. Mammals					
1	Gray Wolf	*Canis lupus*	LC	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
2	Rüppell's fox	*Vulpes ruppelli*	LC	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
3	Brown Bear	*Ursus arctos*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm.. Nov. 2018
4	European otter	*Lutar lutra*	NT	Threatened-illegal hunting and trapping/conflict with fishermen	Wildlife Protection Law No.17 issued 15th Feb. 2010
5	Smooth-coated otter	*Lutra perspicillata*	VU	Threatened-illegal hunting and trapping/conflict with fishermen	Wildlife Protection Law No.17 issued 15th Feb. 2010
6	Stripped hyaena	*Hyaena hyaena*	NT	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
7	Sand Cat	*Felis margarita*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm.. Nov. 2018
8	Jungle Cat	*Felis chaus*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
9	Persian Leopard	*Panthera pardus saxicolor*	VU	Threatened-illegal hunting/conflict with locals	Wildlife Protection Law No.17 issued 15th Feb. 2010
10	Goitred Gazelle	*Gazella subgutturosa*	VU	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
11	Wild goat	*Capra aegagrus*	VU	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010

12	Mouflon	*Ovis orientalis gmelini*	VU	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
13	European Roe Deer	*Capreolus capreolus*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm.. Nov. 2018
14	Caucasian Squirrel	*Sciurus (Tenes) anomalus*	LC	Threatened-illegal hunting and trapping/wildlife trafficking	Wildlife Protection Law No.17 issued 15th Feb. 2010
15	Lesser Egyptian Georba	*Jaculus jaculus*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
16	Indian Crested Porcupine	*Hystrix (Hystrix) indica*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
17	Indo-Pacific Bottlenose Dolphin	*Tursiops aduncus*	DD	Threatened-illegal hunting/conflict with fishermen	Omar Al-Sheikhly pers. comm. Nov. 2018
18	Blue Whale	*Balaenoptera musculus*	EN	Threatened-illegal hunting/conflict with fishermen	Wildlife Protection Law No.17 issued 15th Feb. 2010
19	Bryde's Whale	*Balaenoptera edeni*	LC	Threatened-illegal hunting/conflict with fishermen	Omar Al-Sheikhly pers. comm. Nov. 2018
20	Humpback Whale	*Megaptera novaeangliae*	LC	Threatened-illegal hunting/conflict with fishermen	Omar Al-Sheikhly pers. comm. Nov. 2018

B. Birds ***(status measurement was based on regular reports/observations of illegal hunting/trapping of bird species listed in Wildlife Protection Law No.17, literatures, interviews/observations at local animal markets, hunting association reports, and social media.***					
1	Great crested grebe	*Podiceps cristatus*	LC	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
2	African Darter	*Anhinga rufa*	LC	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
3	Great cormorant	*Phalacrocorax carbo*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
4	Pygmy Cormorant	*Microcarbo pygmaeus*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
5	Western Reef heron	*Egretta gularis*	LC	No recent report/status uncertain	Wildlife Protection Law No.17 issued 15th Feb. 2010; Omar Al-Sheikhly pers. comm. Nov. 2018
6	Goliath heron	*Ardea goliath*	LC	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
7	Eurasian Spoonbill	*Platalea leucorodia*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
8	Grey heron	*Ardea cinerea*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
9	Purple Heron	*Ardea purpurea*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
10	Greta White Egret	*Ardea alba*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018

11	Eurasian Spoonbill	*Platalea leucorodia*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
12	Bald ibis	*Geroniticus eremita*	LC	Rare species- No recent report/status uncertain	Wildlife Protection Law No.17 issued 15th Feb. 2010; Omar Al-Sheikhly pers. comm. Nov. 2018
13	Sacred ibis	*Threskiornis acethiopicus*	LC	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
14	Glossy ibis	*Plegadis falcinellus*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
15	Great White pelican	*Pelecanus onocrotalus*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
16	Mute swan	*Gygnus olor*	LC	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
17	Greylag goose	*Anser anser*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
18	Greater White-fronted goose	*Anser albifrons*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
19	Lesser White-fronted goose	*Anser erythropus*	VU	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
20	Whooper Swan	*Cygnus cygnus*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
21	Bewicki's swam	*Cygnus columbianus*	LC	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
22	Ruddy shelduck	*Tadoma ferruginea*	LC	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
23	Common shelduck	*Tadorna tadorna*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
24	Marbled teal	*Marmaronetta anguistriostns*	VU	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
25	Eurasian Wigeon	*Mareca penelope*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
26	*Northern Shoveler*	*Anas clypeata*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
27	Gadwall	*Mareca strepera*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
28	Mallard	*Anas platyrhynchos*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
29	Northern Pintail	*Anas acuta*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018

30	Garganey	*Spatula querquedula*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
31	Eurasian teal	*Anas crecca*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
32	Red-crested Pochard	*Netta rufina*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
33	Common Pochard	*Aythya ferina*	VU	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
34	Ferruginous duck	*Aythya nyroca*	NT	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
35	Tufted duck	*Aythya fuligula*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
36	White-headed Duck	*Oxyura leucocephala*	EN	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
37	Greater Flamingo	*Phoenicopterus roseus*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
38	Black Stork	*Ciconia nigra*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
39	Black-winged Kite	*Elanus caeruleus*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
40	Black Kite	*Milvus migrans*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
41	Western marsh Harrier	*Circus aeruginosus*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
42	Hen harrier	*Circus cyaneus*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
43	Pallid harrier	*Circus macrourus*	NT	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
44	Montagu's harrier	*Circus pygargus*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
45	White-tailed Sea-eagle	*Haliaeetus albicilla*	LC	No recent report/status uncertain	Wildlife Protection Law No.17 issued 15th Feb. 2010; Omar Al-Sheikhly pers. comm. Nov. 2018
46	Griffon vulture	*Gups fulvus*	LC	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010; Omar Al-Sheikhly pers. comm. Nov. 2018
47	Cinereous vulture	*Aegypius monachus*	NT	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
48	Egyptian Vulture	*Neophron percnopterus*	EN	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018

49	Short-toed Snake Eagle	*Circaetus gallicus*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
50	Eurasian Sparrowhawk	*Accipiter nisus*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
51	Levant Sparrowhawk	*Accipiter brevipes*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
52	Northern Goshawk	*Accipiter gentilis*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
53	Steppe Buzzard	*Buteo buteo*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
54	Long-legged Buzzard	*Buteo rufinus*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
55	Greater Spotted Eagle	*Clanga clanga*	VU	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018; Al-Sheikhly et al. 2018
56	Eastern imperial Eagle	*Aquila heliaca*	VU	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018; Al-Sheikhly et al. 2018
57	Steppe Eagle	*Aquila nipalensis*	EN	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018; Al-Sheikhly et al. 2018
58	Golden eagle	*Aquila chrysaaetos*	LC	No recent report/status uncertain	Wildlife Protection Law No.17 issued 15th Feb. 2010
59	Booted Eagle	*Hieraaetus pennatus*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
60	Common Kestrel	*Falco tinnunculus*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
61	Lesser kestrel	*Falco naumanni*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
62	Merlin	*Falco columbarius*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
63	Eurasian Hobby	*Falco subbuteo*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
64	Lanner falcon	*Falco biarmicus*	LC	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
65	Saker falcon	*Falco cherrug*	EN	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
66	Peregrine falcon	*Falco peregrinus*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
67	Barbary falcon	*Falco peregrinus pelegrinoides*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018

68	Snowcock	*Tetyraogallus caspius*	LC	No recent report/status uncertain	Wildlife Protection Law No.17 issued 15th Feb. 2010; Omar Al-Sheikhly pers. comm. Nov. 2018
69	Chucker partridge	*Alectoris chuckar*	LC	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
70	See see partridge	*Ammoperdix griseogulanris*	LC	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
71	Black partridge	*Francolinus Francolinus*	LC	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
72	Purple gallinule	*Porphrio porphyrio*	LC	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
73	Common Moorhen	*Gallinula chloropus*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
74	Common crane	*Grus grus*	LC	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
75	Demoiselle Crane	*Anthropoides virgo*	LC		
76	Little bustard	*Tetrax tetrax*	NT	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
77	Houbara bustard	*Chlamydotis undulata*	VU	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
78	Great bustard	*Otis tarda*	VU	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
79	Slender-billed curlew	*Numenius tenuirosrtis*	CR	Rare species- No recent report/status uncertain	Wildlife Protection Law No.17 issued 15th Feb. 2010; Omar Al-Sheikhly pers. comm. Nov. 2018
80	Sociable Lapwing	*Vanellus gregarius*	CR	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
81	Slender-billed Gull	*Larus genei*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
82	Common Black-headed gull	*Larus ridibundus*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
83	Armenian Gull	*Larus armenicus*	NT	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
84	Caspian gull	*Larus cachinnans*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
85	Pin-tailed Sandgrouse	*Pterocles alchata*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
86	Spotted Sandgrouse	*Pterocles senegallus*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018

87	Black-bellied Snadgrouse	*Pterocles orientalis*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
88	Stock dove	*Colhmba oenas*	LC	No recent report/status uncertain	Wildlife Protection Law No.17 issued 15th Feb. 2010; Omar Al-Sheikhly pers. comm. Nov. 2018
89	European turtle dove	*Streptopelia turtur*	VU	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
90	Rose-ringed parakeet	*Psittacula krameri*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
91	Eagle owl	*Bubo bubo*	LC	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
92	Pharaoh eagle owl	*Bubo ascalaphus*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
93	Short-eared owl	*Asio flammeus*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
94	Northern Long-eared owl	*Asio otus*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
95	Common Barn owl	*Tyto alba*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
96	*Pallid scops owl*	*Otus brucei*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
97	Indian roller	*Coracias benghalensis*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
98	Common Hoopoe	*Upupa epops*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
99	White-throated kingfisher	*Halcyon smyrnensis*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
100	Blue-cheeked Bee eater	*Merops persicus*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
101	European Bee eater	*Merops apiaster*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
102	Syrian woodpecker	*Dendrocopos syriacus*	LC	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
103	Eurasian magpie	*Pica pica*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
104	Mesopotamian Crow	*Corvus cornix capellanus*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
105	Brown-necked raven	*Corvus ruficollis*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018

106	Black – crowned finch lark	*Eremopterix nigriceps*		No recent report/status uncertain	Wildlife Protection Law No.17 issued 15th Feb. 2010; Omar Al-Sheikhly pers. comm. Nov. 2018
107	Crested lark	*Galerida cristata*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
108	Bimaculated lark	*Melanocorypha bimaculata*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
109	Calandra lark	*Melanocorypha calandra*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
110	Greater short-toed lark	*Calandrella brachydactyla*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
111	Grey Hypocolius	*Hypocolius ampelinus*	LC	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
112	White-eared bulbul	*Pycnonotus leucotis*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
113	Basra reed warbler	*Acrocephalus griseldis*	EN	No recent report/status uncertain	Wildlife Protection Law No.17 issued 15th Feb. 2010; Omar Al-Sheikhly pers. comm. Nov. 2018
114	Long-tailed tit	*Aegithalos caudatus*	LC	No recent report/status uncertain	Wildlife Protection Law No.17 issued 15th Feb. 2010; Omar Al-Sheikhly pers. comm. Nov. 2018
115	Common myna	*Acridotheres tristis*	LC	Threatened-illegal hunting and trapping-Introduced species	Omar Al-Sheikhly pers. comm. Nov. 2018
116	Refous-tailed Bush robin	*Cercotrichas galactotes*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
117	European robin	*Erithacus rubecula*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
118	Dead Sea Sparrow	*Passer moabiticus*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
119	Spanish Sparrow	*Passer hispaniolensis*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
120	Goldfinch	*Carduelis carduelis*	LC	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
121	European Greenfinch	*Chloris chloris*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
122	Desert finch	*Rhodospiza obsoleta*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018

123	Trumpeter finch	*Bucanetes githagineus*	LC	No recent report/status uncertain	Wildlife Protection Law No.17 issued 15th Feb. 2010; Omar Al-Sheikhly pers. comm. Nov. 2018
124	Black-headed bunting	*Emberiza melanocephala*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
C. Reptiles					
1	Desert monitor	*Varanus griseus*	Not assessed	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
2	Spiny - tailed lizard	*Uromastyx aegyptius*	Not assessed	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
3	Common Tortoise	*Testudo graeca*	VU	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
4	Caspian water turtle	*Mauremys caspica*	Not assessed	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
5	Hawk's – bill turtle	*Eretmochelys imbricata*	CR	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
6	Euphrates Soft-shellturtle	*Rafetus euphraticus*	EN	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
7	the long-nosed worm snake or hook-snouted worm snake	*Leptotyphlops macrorhynchus*	LC	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
8	*Javelin sand boa*	*Eryx jaculus*	Not assessed	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
9	Tessellated Water Snake	*Natrix tessellata*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
10	Large Whip Snake	*Dolichophis jugularis*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
11	Levantine viper or blunt-nosed viper	*Macrovipera lebetina*	Not assessed	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
12	Persian horned viper	*Pseudocerastes persicus*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
13	Field's Horned Viper	*Pseudocerastes fieldi*	LC	Threatened-illegal hunting and trapping	Omar Al-Sheikhly pers. comm. Nov. 2018
D. Amphibians					
1	Brusa Frog	*Rana camerani*	LC	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
2	Pakistan Toad	*Bufo surdus*	LC	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
3	Eastern Spadefoot	*Pelobates syriacus*	LC	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010

4	Lake Urmia Newt	*Neurergus crocatus*	VU	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
5	Kurdistan Newt	*Neurergus microspilotus*	CR	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
E. Fishes					
1	Iraq blind barb	Typhlogarra widdowsoni	CR	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
2	Haditha Cavefish	*Caecocypris basimi*	CR	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
3		*Luciobarbus esocinus*	LC	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
4	Binni	*Mesopotamichthys sharpeyi*	VU	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
5	Mesopotamian himri	*Carasobarbus luteus*	VU	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
6	Berzem	*Luciobarbus kersin*	DD	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
7	Gattan	*Luciobarbus xanthopterus*	VU	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
8	Shabout	*Arabibarbus grypus*	VU	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
9	spirlin	*Alburnoides bipunctatus*	LC	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
10	Mesopotamian nase	*Chondrostoma regium*	LC	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
12		*Leuciscus spurius*	Not assessed	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
13	Long-spine Bream	*Acanthobrama centisquama*	CR	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010
14	Hilsa	*Tenualosa ilisha*	LC	Threatened-illegal hunting and trapping	Wildlife Protection Law No.17 issued 15th Feb. 2010

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Http://Www.Moen.Gov.Iq/Portals/11/Status-Of-Euphrates-Soft-Shelled-Turtle-Rafetus-Euphraticus-In-The-Iraqi-Central-Marsh%20.Pdf

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Annex No.3

Biodiversity survey form

1 – Site information

Site name		Closest city		Province	
Start survey time	AM:	End survey time	PM:	Date	
Coordinates of closest point (start)		N:		E:	
Coordinates of Farthest point (end)		N:		E:	
Type of environment*		Main:		Secondary:	
Reasons to choose a site	KBA:	IBA:	IPA:	Others:	
Type of monitoring	vehicle	Walk:	Boat:	Monitoring tower:	Fixed point:
Used instrument and tools:	Binoculars:	Monitor:	Cameras:	Videos:	Others:
Weather condition	Nice:	Cloudy:	Partially cloudy:	Cloudy rain: Foggy:	Sandy:
Other information:					

*refer to appendix table no. 1

2 – The environment threats* of the site:

	Threats	Time (1-3)	Range (1-3)	Intensity (1-3)
1-	Density and agricultural expansion			
2-	Residential and commercial development			
3-	Energy production and mining) Gravel quarries, oil field development, electricity and communication tower…etc.)			
4-	Roads and transport services (transport and shipping development on these roads)			
5-	Over exploitation) wood cutting and transportation, overhunting and overfishing)			
6-	Interference and human inconvenience) Non-consumption of vital sources, entertainment activities, military activities and wars. etc.)			
7-	Ecosystem changes (Dams and water management, Groundwater withdrawal, digging canals…etc.)			
8-	Invasive alien species			

9-	Pollution (garbage, industrial waste ,air, noise, heating pollution)			
10-	Geological events (earthquakes…etc.)			
11-	Climate changes, sever weathers, Drought and floods			
12-	Others			

*For level of threats, refer to Appendix table no. 2

3 – Bird list

	Arabic name	Scientific name	It's status in site*	Type of the threat**	No
1					
2					
etc.					

*status of Birds (resident, winter visitor, summer visitor, to have chicks, passing, stray) it may have more that characteristic

**Threatened kind (Overhunting with mentioning hunting kind, Destruction of the nests, chicks stealing, habitat destruction…etc.)

4 - Mammal list

	Arabic name	Scientific name	observation	Other methods of indication*	Type of threat**	No
1						
2						
etc.						

*(foot print, den or terrier, The remains of prey, animal remains, local communities feedback)

**(overhunting with the kind, Trading in its members, sold to the Zoo, destruction of its habitat.)

5 -Fish list

	Arabic name	Scientific name	Average length	Average weight	Type of the threat*	percentage
1						
2						
etc.						

*(overfishing with mentioning the kind, hunting by accident, competition with other kind, destruction of natural habitats, climate change. etc.)

6 -Plant list

	Arabic name	Scientific name	Type of the threat*	Intensity of presence
1				
2				
etc.				

*(overcutting, competitions with other kind, destruction of natural habitats, Climate Change)

7 - Reptile and Amphibian list

	Arabic name	Scientific name	observation	Other methods of indication*	Type of the threat**	No
1						
2						
etc.						

*(foot print, den or terrier, The remains of prey, animal remains, local communities feedback)

**(overhunting with the kind, Trading in its members, sold to the Zoo, destruction of its habitat.)

Responsible of the survey and data filling	1 -	2 -	3 -

Biodiversity Area Survey Supplement

Types of Environment

Type of environment	Description
mountainous areas	2700 – 3750 m
Highlands	1700 – 3000 m
Forests	Wooden cover – more than 60 – 100%
Scattered forests	Herbaceous plant – Wooden cover – 10-25%
Areas of shrubs	Shrubs cover 50-100% with wood cover 25%
Grassland	Wood and Shrubs (if found)-cover 25%
Multiple vegetation areas	Equal proportion of vegetation, trees, shrubs and grasses
Agricultural	
Desert	Little or no vegetation
Seasonal marshes	Include River, Stream, Channel, Swamp, Lake
The permanent marshes	Include River, Stream, Channel, Swamp, Lake
Maritime	

Threats account

Time of threat	Degree
Happens now	3
Probably in the near term (within 4 years)	**2**
Probably in the long term (after 4 years)	1
Past (is unlikely to return) is no longer threatened	zero
None	-

The extent of threat	
All the area/ population covers more than 90%	3
Most of the area/population covers 50-90%	2
Part of the area/few individuals covering 10%-49%	1
Small area/few individuals less than 10% of area or no threats present	zero
None	-
The severity of the threat	
Fast degradation more than 30% for 10 years or 3 generations, whichever longer	3
Moderate degradation 10-30% for 10 years or 3 generations	2
Low degradation 1-10% for 10 years or 3 generations	1
No degradation less than 1% more than 10 years or there is no threats	zero
None	-

Calculate the summed total value of the effect based on this survey work:

Value of the threatened effect = Timing level + Range level + Severity level

(0-2 low) (3-5 moderate) (6-7 High) (8-9 Very high)

Annex No.4

List which consist of invasive alien species (updated information were shown in yellow shade)

A. Flora (Total of 60 species: 56 terrestrial species and 4 Aquatic species).

No.	Type	Scientific Name	Common Name	Country/ Detailed Location	Occurrence	Provenance	Invasive	Establishment Method	Pathways of introduction	References
1. Terrestrial (Land) Plants										
1	Land plant/grass	*Panicum repens*	Torpedo grass	Iraq	Established	Uncertain	Not specified	Unknown	Unknown	CABI Invasive Species Compendium, 2013
2	Land plant/grass	*Paspalum distichum*	Knotgrass	Iraq	Established	Alien	Not specified	Unknown	Unknown	CABI Invasive Species Compendium, 2013
3	Land plant/grass	*Taraxacum croceum*(1)	dandelion	Iraq	Established	Invasive	Invasive	Intentional	Unknown	CAB International (2014). CABI Invasive Species Compendium (ISC). GRIIS
4	Land plant/grass	*Erigeron Canadensis*(1)	Canadian fleabane	Iraq	Established	Invasive	Invasive	Intentional	Unknown	Al Haboob (2014). Al Haboob. Pers.Comm. GRIIS
5	Land plant/grass	*Solanum elaeagnifolium*(2)	silverleaf nightshade	Iraq	Reported	Invasive	Invasive	Intentional	Unknown	Haloob, 2016
6	Land plant/herb	*Atriplex halimus*(2)	Mediterranean saltbush	Iraq	Reported	Alien	Not specified	Intentional	Unknown	Haloob, 2016

7	Land plant/herb	*Atriplex canescens*[(2)]	fourwing saltbush	Iraq	Reported	Alien	Not specified	Intentional	Unknown	Haloob, 2016
8	Land plant/herb	*Atriplex semibaccata*[(2)]	Australian saltbush	Iraq	Reported	Alien	Not specified	Intentional	Unknown	Haloob, 2016
9	Land plant/herb	*Atriplex nummularia*[(2)]	old-man saltbush	Iraq	Reported	Invasive	Invasive	Intentional	Unknown	Haloob, 2016
10	Land plant/herb	*Atriplex holocarpa*[(2)]	pop saltbush	Iraq	Reported	Alien	Not specified	Intentional	Unknown	Haloob, 2016
11	Land plant/herb	*Atriplex hortensis*[(2)]	garden orache	Iraq	Reported	Alien	Not specified	Intentional	Unknown	Haloob, 2016
12	Land plant/herb	*Cuscuta campestris*	Field dodder	Iraq	Established	Alien	Not specified	Unknown	Unknown	CABI Invasive Species Compendium, 2013
13	Land plant/herb	*Senna alexandrina (=Cassia senna)*	Alexandrian senna	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Ali-Haloob pers. comm January 2014 (5th CBD Report)
14	Land plant/herb	*Taraxacum officinale complex*	Dandelion	Iraq	Established	Alien	Not specified	Unknown	Unknown	CABI Invasive Species Compendium, 2013
15	Land plant/palm	*Washingtonia robusta*	Washington fan palm	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Ali-Haloob pers. comm January 2014 (5th CBD Report)
16	Land plant/palm	*Washingtonia filifera*	California fan palm	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Ali-Haloob pers. comm January 2014 (5th CBD Report)

17	Land plant/shrub	*Senna artemisioides (=Cassia artemisioides)*	Feathery cassia	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Ali-Haloob pers. comm January 2014 (5th CBD Report)
18	Land plant/shrub	*Senna corymbosa (=Cassia corymbosa)*	Argentine senna	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Ali-Haloob pers. comm January 2014 (5th CBD Report)
19	Land plant/shrub	*Senna didymobotrya (=Cassia didymobotrya)*	African senna	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Ali-Haloob pers. comm January 2014 (5th CBD Report)
20	Land plant/shrub	*Senna occidentalis*	Coffee senna	Iraq	Established	Alien	Not specified	Unknown	Unknown	CABI Invasive Species Compendium, 2013
21	Land plant/shrub	*Senna occidentalis (=Cassia occidentalis)*	Senna coffee	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Ali-Haloob pers. comm January 2014 (5th CBD Report)
22	Land plant/shrub	*Senna sophera (=Cassia sophera)*		Iraq	Reported	Alien	Not specified	Unknown	Unknown	Ali-Haloob pers. comm January 2014 (5th CBD Report)
23	Land plant/shrub	*Tetrapanax papyrifer*	Rice-paper plant	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Ali-Haloob pers. comm January 2014 (5th CBD Report)
24	Land plant/shrub-tree	*Prosopis spp.*	Mesquite	Iraq	Established	Alien	Invasive	Unknown	Unknown	Pasiecznik 2001
25	Land plant/tree	*Acacia karroo*	karoothorn	Iraq	Established	Alien	Not specified	Unknown	Unknown	CABI Invasive Species Compendium, 2013

26	Land plant/tree	*Acacia saligna (=Acacia cyanophylla)*	Orange wattle	Iraq	Established	Alien	Not specified	Unknown	Unknown	Midgely & Turnbull, 2003
27	Land plant/tree	*Albizia julibrissin*	Silk tree	Iraq	Established	Alien	Not specified	Unknown	Unknown	CABI Invasive Species Compendium, 2013
28	Land plant/tree	*Albizia lebbeck*	Indian siris	Iraq	Established	Alien	Not specified	Unknown	Unknown	CABI Invasive Species Compendium, 2013
29	Land plant/tree	*Bauhinia purpurea*	Butterfly tree	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Ali-Haloob pers. comm January 2014 (5th CBD Report)
30	Land plant/tree	*Bauhinia variegata*	Butterfly tree	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Ali-Haloob pers. comm January 2014 (5th CBD Report)
31	Land plant/tree	*Cassia fistula*	Golden shower	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Ali-Haloob pers. comm January 2014 (5th CBD Report)
32	Land plant/tree	*Casuarina equisetifolia*	Australian pine	Iraq	Established	Alien	Not specified	Unknown	Unknown	CABI Invasive Species Compendium, 2013
33	Land plant/tree	*Dalbergia sissoo*	Indian rosewood	Iraq	Reported	Alien	Not specified	Unknown	Unknown	World AgroForestry Centre, 2013
34	Land plant/tree	*Eucalyptus camaldulensis*	Red gum	Iraq	Established	Alien	Not specified	Unknown	Unknown	CABI Invasive Species Compendium, 2013
35	Land plant/tree	*Eucalyptus spp. (37 known species)*	Gum	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Flora of Iraq

36	Land plant/tree	*Gleditsia triacanthos*	Honey locust	Iraq	Established	Alien	Not specified	Unknown	Unknown	CABI Invasive Species Compendium, 2013
37	Land plant/tree	*Leucaena leucocephala*	Leucaena	Iraq	Established	Alien	Not specified	Unknown	Unknown	CABI Invasive Species Compendium, 2013
38	Land plant/tree	*Melia azedarach*	Chinaberry	Iraq	Established	Alien	Not specified	Unknown	Unknown	CABI Invasive Species Compendium, 2013
39	Land plant/tree	*Parkinsonia aculeata*	Parkinsonia	Iraq	Established	Alien	Not specified	Unknown	Unknown	CABI Invasive Species Compendium, 2013
40	Land plant/tree	*Pinus halepensis*	Aleppo pine	Iraq	Established	Alien	Not specified	Unknown	Unknown	CABI Invasive Species Compendium, 2013
41	Land plant/tree	*Pithecellobium dulce*	Manila tamarind	Iraq	Established	Alien	Not specified	Unknown	Unknown	CABI Invasive Species Compendium, 2013
42	Land plant/tree	*Robinia pseudoacacia*	Black locust	Iraq	Established	Alien	Not specified	Unknown	Unknown	CABI Invasive Species Compendium, 2013
43	Land plant/tree	*Senegalia laeta (=Acacia laeta)*		Iraq	Reported	Alien	Not specified	Unknown	Unknown	Ali-Haloob pers. comm January 2014 (5th CBD Report)
44	Land plant/tree	*Vachellia cornigera (= Acacia cornigera)*	Bullhorn Acacia	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Ali-Haloob pers. comm January 2014 (5th CBD Report)
45	Land plant/tree	*Vachellia farnesiana (=Acacia farnesiana)*	Needle bush	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Ali-Haloob pers. comm January 2014 (5th CBD Report)

46	Land plant/tree	*Vachellia nilotica (Acacia nilotica)*	Gum Arabic tree	Iraq	Established	Alien	Not specified	Unknown	Unknown	CABI Invasive Species Compendium, 2013
47	Land plant/tree	*Ziziphus mauritiana*	Jujube	Iraq	Established	Alien	Not specified	Unknown	Unknown	Ali-Haloob pers. comm January 2014 (5th CBD Report)
48	Terrestrial Plant / Tree	*Cynodon dactylon*	Bermuda grass	Iraq	Established	Alien	Not specified	Unknown	Unknown	CABI Invasive Species Compendium, 2013
49	Terrestrial Plant / Tree	*Dactyloctenium aegyptium*	Crowfoot grass	Iraq	Established	Uncertain	Not specified	Unknown	Unknown	CABI Invasive Species Compendium, 2013
50	Land plant/vine	*Conyza canadensis*	Canadian fleabane	Iraq	Established	Alien	Not specified	Unknown	Unknown	CABI Invasive Species Compendium, 2013
51	Land plant/vine	*Lonicera japonica*	Japanese honeysuckle	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Ali-Haloob pers. comm January 2014 (5th CBD Report)
52	Land plant/vine	*Lonicera maackii*	Amur honeysuckle	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Ali-Haloob pers. comm January 2014 (5th CBD Report)
53	Land plant/vine	*Lonicera morrowii*	Morrow's honeysuckle	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Ali-Haloob pers. comm January 2014 (5th CBD Report)
54	Land plant/vine	*Lonicera periclymenum*	European honeysuckle	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Ali-Haloob pers. comm January 2014
55	Land plant/vine	*Lonicera sempervirens*	Trumpet honeysuckle	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Ali-Haloob pers. comm January 2014 (5th CBD Report)

56	Land plant/host	*Cuscuta pentagona*(1)	fiveangled dodder	Iraq	Established	Alien	Not specified	Unknown	Unknown	CAB International (2014). CABI Invasive Species Compendium (ISC). GRIIS
2. Aquatic Plants										
57	Aquatic plant	*Eichhornia crassipes*	Water hyacinth	Iraq	Reported	Invasive	Invasive	Unknown	Unknown	Ali-Haloob pers. comm January 2014 (5th CBD Report)
58	Aquatic plant	*Hydrilla verticillata*	Hydrilla	Iraq	Established	Alien	Invasive	Unknown	Unknown	Al-Kenzawi, 2011; Al-Mandeel, 2013; (5th CBD Report)
59	Aquatic plant	*Azolla filiculoides*(3)	water fern	Iraq	Reported	Invasive	Invasive	Unknown	Unknown	Al-Mayah and Malik Al-Saadi, 2016
60	**Alga**	*Polysiphonia brodiei*	Brodie's Siphon Weed	Iraq	Reported	Alien	Not specified	Unknown	Unknown	CABI Invasive Species Compendium, 2013

B. Fauna

No.	Type	Scientific Name	Common Name	Country/ Detailed	Occurrence	Provenance	Invasive	Establishment Method	Pathways of introduction	References
1. **Vertebrates (Total of 36 species 7 mammals; 7 birds; 22 fishes)**										
1	Mammal	*Bos taurus*	Cattle	Iraq	Established	Alien	Not specified	Unknown	Unknown	CABI Invasive Species Compendium, 2013
2	Mammal	*Capra hircus*	Goat	Iraq	Established	Alien	Not specified	Unknown	Unknown	CABI Invasive Species Compendium, 2013

3	Mammal	*Equus asinus*	Donkey	Iraq	Established	Alien	Not specified	Unknown	Unknown	CABI Invasive Species Compendium, 2013
4	Mammal	*Oryctolagus cuniculus*	Rabbit	Iraq	Established	Alien	Not specified	Unknown	Unknown	CABI Invasive Species Compendium, 2013
5	Mammal	*Ovis aries*	Sheep	Iraq	Established	Alien	Not specified	Unknown	Unknown	CABI Invasive Species Compendium, 2013
6	Mammal	*Suncus murinus*	Asian house shrew	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Varnham, Karen, pers. comm, 2002 (5th CBD Report); Al-Sheikhly et al. 2015
7	Mammal	*Rattus norvegicus*	Norway rat	Iraq	Established	Alien	Not specified	Unknown	Unknown	(5th CBD Report); Al-Sheikhly et al. 2015
8	Birds	*Acridotheres tristis*	Common myna	Iraq	Established	Alien	Not specified	Unknown	Unknown	Holzapfel et al 2006
9	Birds	*Psittacula krameri*	Rose-ringed parakeet	Iraq	Established	Alien	Not specified	Escape from cages	Unknown	BirdLife International, 2012; (5th CBD Report)
10	Birds	*Spilopelia senegalensis*	Laughing Dove	Iraq	Established	Alien	Invasive	Natural expansion	Unknown	Mudhafar Salim, pers.comm. Feb 2014; (5th CBD Report)
11	Birds	*Oena capensis*	Namaqua Dove	Iraq	Established	Alien	Not specified	Natural expansion	Unknown	Mudhafar Salim, pers.comm. Feb 2014; (5th CBD Report)

12	Birds	*Elanus caeruleus*	Black-shouldered Kite	Iraq	Established	Alien	Not specified	Natural expansion	Unknown	Mudhafar Salim, pers.comm. Feb, 2014; (5th CBD Report).
13	Birds	*Euodice malabarica*(*)	Indian Silverbill	Iraq	Established	Uncertain	Not specified	Exotic cagebird, populations established from escapes	Exotic bird trade/traffic	Omar Al-Sheikhly Pers. comm. Nov, 2018
14	Birds	*Acridotheres ginginianus* (4)	Bank Myna	Iraq	Established	Alien	Not specified	Unknown	Unknown	Ali Al-Barazengy , Omar Al-Sheikhly In publishing
15	Fish	*Acanthalburnus microlepis*	Blackbrow bleak	Iraq	Established	Alien	Not specified	Unknown	Unknown	Froese & Pauly, 2013
16	Fish	*Carassius auratus auratus*	Goldfish	Iraq	Established	Alien	Invasive	Intentional	Aquaculture	FAO Fisheries and Aquaculture 2013; Mohamed et al 2008, Mohamed et al 2012; Al-Lamy et al 2012
17	Fish	*Clarias gariepinus*	North African catfish	Iraq	Established	Alien	Not specified	Intentional	Aquaculture	Froese & Pauly, 2013
18	Fish	*Ctenopharyngodon idella*	Grass carp	Iraq	Established	Alien	Not specified	Intentional	Aquaculture/ Weed control/ Biological	FAO Fisheries and Aquaculture 2013; Mohamed et al 2008, Mohamed et al 2012

19	Fish	*Cyprinus carpio*	Common carp	Iraq	Established	Alien	Invasive	Intentional	Aquaculture	FAO Fisheries and Aquaculture 2013; Mohamed et al 2008, Mohamed et al 2012
20	Fish	*Gambusia holbrooki*	Mosquitofish	Iraq	Established	Alien	Not specified	Intentional	Biological Control	FAO Fisheries and Aquaculture 2013; Al-Daham et al 1977;
21	Fish	*Gambusia holbrooki*	Eastern mosquitofish	Iraq	Established	Alien	Not specified	Intentional	Biological Control (mosquitoes)	FAO Fisheries and Aquaculture 2013; Mohamed et al 2008, Mohamed et al 2012
22	Fish	*Hemiculter leucisculus*	Sharpbelly	Iraq	Reported	Alien	Not specified	Unknown	Unknown	FAO Fisheries and Aquaculture 2013
23	Fish	*Heteropneustes fossilis*	Stinging catfish	Iraq	Established	Alien	Not specified	Intentional	Biological control (snails)	FAO Fisheries and Aquaculture 2013; Mohamed et al 2008, Mohamed et al 2012
24	Fish	*Hypophthalmichthys nobilis*	Bighead carp	Iraq	Reported	Alien	Invasive	Intentional	Aquaculture	FAO Fisheries and Aquaculture 2013; Froese & Pauly, 2013
25	Fish	*Hypophthalmichthys molitrix*	Silver carp	Iraq	Reported	Alien	Invasive	Intentional	Aquaculture/ Research	FAO Fisheries and Aquaculture 2013
26	Fish	*Planiliza subviridis*	Greenback mullet	Iraq	Reported	Uncertain	Not specified	Unknown	Fisheries	FAO Fisheries and Aquaculture 2013

27	Fish	*Oncorhynchus mykiss*	Rainbow trout	Iraq	Reported	Alien	Not specified	Intentional	Aquaculture	FAO Fisheries and Aquaculture 2013
28	Fish	*Oreochromis niloticus*	Nile tilapia	Iraq	Reported	Alien	Not specified	Intentional	Aquaculture/ Weed control	FAO Fisheries and Aquaculture 2013
29	Fish	*Poecilia latipinna*	sailfin molly	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Mohamed et al 2012
30	Fish	*Sarotherodon galilaeus*	Mango tilapia	Iraq	Reported	Alien	Not specified	Unknown	Aquaculture/ Research	FAO Fisheries and Aquaculture 2013
31	Fish	*Tilapia zillii*	Redbelly tilapia	Iraq	Reported	Alien	Not specified	Unknown	Aquaculture/ Weed control	FAO Fisheries and Aquaculture 2013; Al-Lamy et al 2012
32	Fish	*Carassius gibelio*[5]	Gibel carp	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Al-Faisal et al. 2014
33	Fish	*Oreochromis aureus*[5]	Blue tilapia	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Al-Faisal et al. 2014
34	Fish	*Atractosteus spatula*[5]	Alligator Gar	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Mutlak et al,2017
35	Fish	*Poecilia latipinna*[5]	Sailfin Molly	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Al-Faisal et al. 2014

36	Fish	*Pangasianodon hypophthalmus* (6)	Sutchi catfish	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Khamees, et al. 2013
# The occurrence of these species is explained by its regional natural expansion and establishment which may not qualified it as an Alien /invasive species these species was not listed in the Global Invasive Species Database (IUCN / ISSG) and the Global Register Of Introduced And Invasive Species (GRIIS) 2018 , Except the Namaqua Dove *Oena capensis* which recorded as invasive species in Jordan . (Omar Al-Sheikhly Pers. comm. Nov, 2018),										
2. Invertebrates (total of 23 species: 2 Molluscs; 4 Crustacean; 1 carb; 15 insects, 1 Spider)										
1	Mollusc	*Dreissena polymorpha*(1)	Zebra mussel	Iraq	Reported	Alien	Not specified	Natural dispersal	Water course	Salman, et al 2014. GRIIS
2	Mollusc	*Potamopyrgus antipodarum*	New Zealand mud snail	Iraq	Established	Alien	Invasive	Unknown	Unknown	Naser & Son, 2009
3	Crustacean	*Eriocheir hepuensis*	Hepu mitten crab	Iraq	Established	Alien	Not specified	Accidental	Larval forms in Ballast water/ Adult on ship's	Naser et al. 2012
4	Crustacean	*Eriocheir sinensis*	Chinese mitten crab	Iraq	Established	Alien	Invasive	Accidental	Larval forms in Ballast water/ Adult on ship's	Clark et al. 2006; Hashim 2012
5	Crustacean	*Macrobrachium nipponense*	Oriental River prawn	Iraq	Established	Alien	Not specified	Accidental	Unknown	Salman et al. 2006
6	Crustacean	*Pseudodiaptomus c.f. ardjuna*	Calonid copepod	Iraq	Established	Alien	Not specified	Accidental	Ballast water/ ship's hulls	Mohamed 2011

7	Crustacean	*Halimede tyche*[7]		Iraq	Established	Alien	Not specified	Accidental	Unknown	Ali Al-Barazengy Pers. comm. Dec, 2018 based on Al-Khafaji et al. 2017
8	Insect	*Culex quinquefasciatus*	Southern house mosquito	Iraq	Established	Alien	Not specified	Unknown	Unknown	Harbach, 1988 in CABI Invasive Species Compendium
9	Insect	*Leptocybe invasa*	Eucalyptus Gall wasp	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Hasan 2012
10	Insect	*Lymantria dispar*	Gypsy moth	Iraq	Reported	Alien	Not specified	Unknown	Unknown	European Plant Protection Organisation (EPPO), 2013
11	Insect	*Papilio demoleus*	Chequered swallowtail	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Larsen 1977
12	Insect	*Paratrechina longicornis*	Crazy ant	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Harris & Abbott, n.d.
13	Insect	*Rhynchophorus ferrugineus*	Red Palm weevil	Iraq	Reported	Alien	Invasive	Unknown	Unknown	European Plant Protection Organisation (EPPO), 2013
14	Insect	*Tapinoma melanocephalum*	Ghost ant	Iraq	Reported	Alien	Invasive	Unknown	Unknown	Donisthorpe, 1918 in Wetterer, 2009
15	Insect	*Trogoderma granarium*	Khapra beetle	Iraq	Reported	Alien	Not specified	Unknown	Unknown	European Plant Protection Organisation (EPPO), 2013

16	Insect	*Varroa destructor*	Varroa mite	Iraq	Reported	Alien	Not specified	Unknown	Unknown	World Organisation for Animal Health (OIE), 2013
17	Insect	*Tuta absoluta*[1]	Tomato leafminer	Iraq	Established	Alien	Not specified	Unknown	Unknown	Al Haboob (2014). Al Haboob. Pers.Comm. GRIIS
18	Insect	*Leptinotarsa decemlineata*[1]	Colorado beetle	Iraq	Established	Alien	Not specified	Unknown	Unknown	Al Haboob (2014). Al Haboob. Pers.Comm. GRIIS
19	Insect	*Dacus ciliates* [1]	Cucurbit fly	Iraq	Established	Alien	Not specified	Unknown	Unknown	Al Haboob (2014). Al Haboob. Pers.Comm. GRIIS
20	Insect	*Aleuroclava jasmine*[1]	jasmine whitefly	Iraq	Established	Alien	Not specified	Unknown	Unknown	Al Haboob (2014). Al Haboob. Pers.Comm. GRIIS
21	Insect	*Parasaissetia nigra*[8]	pomegranate scale	Iraq	Established	Alien	Not specified	Unknown	Unknown	Ali Al-Barazengy Pers. comm. Dec, 2018 based on Abdul-Rassoul and Al-Mallo, 2016
22	Insect	*phenacoccus solenopsis*[9]	cotton mealybug	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Abdul-Rassoul, 2018
23	Arthropod	*Latrodectus scelio*[10]	Red-Back Spider	Iraq	Reported	Alien	Not specified	Unknown	Unknown	Abdul-Rassoul et al, 2012

The yellow highlighted species represent the species added to the list: 10 plants, 2 birds, 5 fish, 1 crust, 6 insects. According to the references indicated for each species.

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Project photos

1st Steering Committee meeting on 24th April 2018

Project Inception on 7th March 2018

1st Technical workshop on 5th June 2018

Working Groups Consultation meetings

Stakeholders workshop on 25-26 Nov 2018

PRESS RELEASES (HTTPS://WWW.IQ.UNDP.ORG)
UNDP SUPPORT TO IRAQ'S SIXTH NATIONAL REPORT ON CONVENTION ON BIODIVERSITY

Posted on June 5, 2018

UNDP Support to Iraq's Sixth National Report on Convention on Biodiversity

National biodiversity experts, senior representatives from the Iraqi Ministries and other institutions participated in the workshop. Photo: UNDP Iraq/2018

***Baghdad, 05 June 2018* – The United Nations Development Programme (UNDP) and the Iraqi Ministry of Health and Environment conducted the first technical workshop on drafting the Sixth National Report (6NR) of the Convention on Biodiversity (CBD) to start the critical report preparation consistent with the highest standards of scientific and gender-responsive data analysis, with the purpose of informing the fifth Global Biodiversity Outlook (GBO5) and the Global Biodiversity Strategy of 2021 – 2030.**

In the two-day workshop participated international experts, a cross-section of national biodiversity experts, senior representatives from the Ministries of Health and Environment, Agriculture, Planning, Water Resources, Higher Education, Iraqi Universities, several academic and research institutions and a number of NGOs working on biodiversity. All stakeholders who will play an important role in the process as data providers and in drafting the report chapters. The workshop was organized by the UNDP-Environment, Energy and Climate Change Program and funded by UNDP-*Global Environment Facility* (GEF). The framework for a time-bound preparation of the Iraqi national report will be set based on scientific data, reflecting thorough analysis of progress in the achievement of biodiversity-related national targets.

In his opening speech, The Deputy Minister for Health and Environment Dr. Jassim Al Falahi said: "Iraq's commitment to the Convention on Biodiversity requires us to complete the sixth national report within the time

set by the General Secretariat of the Convention, and to mobilize all the necessary resources to complete the report". He added: "the report will provide an opportunity to identify what has been accomplished by all relevant stakeholders in the field of biodiversity conservation, for the first three years of implementation phase of the National Strategy for Biodiversity 2015-2020".

The Head of UNDP- Energy, Environment and Climate Change programme, Mr. Tarik ul-Islam highlighted the importance of adopting a participatory approach for the preparation of the Sixth National Report by the Government of Iraq. He said: "The report will benefit from the participation of all professional bodies to ensure that inputs in the report adhere to the highest standards of scientific analysis and global quality, leading to a report that Iraq will be truly proud of".

The project was launched in March 2018 under the leadership of the Deputy Minister for Health and Environment of Iraq. A project steering committee for preparation of the 6NR Project has been established. Roles and responsibilities and the work plan has been approved for preparation of drafting the Sixth National Report, following a nationally-led and nationally-owned process.

Integrating gender mainstreaming perspective, the project focus on gender-responsive planning, gender-disaggregated data analysis, as well as on the involvement of women as stakeholders and participants in various project teams. In addition, the report will reflect Iraq's contributions to the attainment of the global (Aichi Biodiversity Targets) to reflect the main issues addressed by the Sustainable Development Goals and Agenda 2030.

With financial support from the GEF, the CBD Secretariat has received 181 fifth national reports. The information received from Parties has been used in the formulation of the Strategic Plan for Biodiversity 2011-2020 and its Aichi Biodiversity Targets, the globally agreed framework to conserve, restore and sustainably use biodiversity and enhance its benefits for people.

This project proposes to enhance CBD's efforts to build national reporting capacity by providing targeted and timely technical and financial support to a wide range of countries in an effective and cost-efficient manner. The project objective is to support parties to develop high quality, gender-responsive and data driven 6NRs, that are owned by stakeholders, and more accurately report on progress towards achieving the Aichi Biodiversity Targets (ATB)/ national Biodiversity Targets and implementing National Biodiversity Strategy and Action Plans (NBSAPs) using nationally verified data, with the purpose of informing the fifth Global Biodiversity Outlook (GBO5) and the Global Biodiversity Strategy of 2021 – 2030.