



THE STATE OF **IRAQ'S**  
BIODIVERSITY FOR FOOD AND  
AGRICULTURE

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**THE STATE OF IRAQ  
BIODIVERSITY FOR FOOD AND AGRICULTURE**



الله أكبر



**BRIEF REPORT  
BY  
SAHAR AL – BAYATTI  
ABDUL AMIR A. ESSA**

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## 1.1 GENERAL CONTEXT

## **A) Role of biodiversity for food and agriculture.**

Ancient findings suggest that the first agriculture, domestication of animals, and transition to a sedentary lifestyle took place in Iraq or what was known as Mesopotamia, which is the land in and around the Tigris and Euphrates rivers and also is the biggest part of the Fertile Crescent region, the region often called the Cradle of Civilization. Therefore its biological diversity is very valuable due to rich genetic diversity which it holds. According to many scientists the more close to the center of domestication the more genetic diversity will be found (Tapio *et al.*, 2010; Peter *et al.*, 2007; Loftus *et al.*, 1999). These genetic resources are valuable to poor livestock smallholders, farmers and fishermen in Iraq and may be important raw material for future animal and plant genetic improvement and food security for the country. With the establishment of a new government (after 2003) it was realized that Iraq needs to evaluate its biological diversity and conserve it. Therefore the Ministry of Agriculture established a program to conserve its animal and plant genetic resources. As a result of this program's formation, an Animal and Plant Genetic Sources Department in the Ministry of Agriculture was established and the developing of staff, policies, building laboratories and gene bank repository facilities for the projects are going on since 2010 for the animal and even earlier for plant. The Ministry of Agriculture also ratified the International Treaty on Plant Genetic Resources in 2012. In the other hand the former Ministry of Environment (now Environment Directorate on the Ministry of Health) led the country's accession to the Convention on Biological Diversity (CBD) and Iraq has become a member party of the Convention in 2009, and ratified the Cartagena Protocol on Biosafety in 2013 and generated regulation to deal with Genetically Modified organisms and its products which was endorsed by the government in 2015.

It should be noted that after over 25 years of war and sanctions in which very little work was done to document or protect Iraq's biological diversity, large gaps still remain to be filled (Ministry of Environment National Report, 2010) and therefore hard to tell about biodiversity changes in the past ten years however one of the major features of it may be rising awareness of biodiversity importance.

The United Nations Environmental Programme in 2003 listed four main threats to biodiversity in Iraq (1) lack of institutional or legal framework for conservation of biodiversity 2) lack of any effective protected areas network 3) lack of national biodiversity strategy or action plan 4) many species under threat from ecosystem degradation especially from the loss of the Mesopotamian marshlands and oil spills. However we are working now on solving those problems.

## B) Production systems present in the country.

The Republic of Iraq is in southwest Asia between latitudes 29°5' and 37°22' N and longitudes 38°45' and 48°45' E, with a total area ~ 438317 km<sup>2</sup>. It forms the eastern frontier of the Arab countries. Turkey to the north , Iran to the east, Jordan, Syria, and the Kingdom of Saudi to the west and the Arabian Gulf , Kuwait and the Kingdom of Saudi Arabia to the south. It displays a great diversity of climate (continental and subtropical), soil types and well characterized physiographic regions (Zagros mountain region, Foothills region, desert region, Jazeera region and the Mesopotamian plain region) The two rivers Tigris and Euphrates and their tributaries contribute to this variation and to the creation of different zones and habitats (Magid *et al.*, 2003). This resulted in the creation of many production systems in the country.

**Table 1.** Production systems present in the country.

<b>Production system</b>	<b>Indicate if present in the country (Y/N)</b>
Livestock grassland-based	Y
Livestock landless systems	Y
Naturally regenerated forests	Y
Planted forests	N
Self-recruiting capture	Y
Culture-based fisheries	Y
Fed aquaculture	N
Non-fed aquaculture	N
Irrigated crops (rice)	Y
Irrigated crops (other)	Y
Rainfed crops	Y
Mixed systems (livestock,	Y
Others (please specify)	

### **Description:**

- **Livestock grassland-based:** The operation of this system takes place under sedentary transhumant and nomadic system. In the nomadic and transhumant

flocks of sheep, goat and cows are grazed extensively on natural vegetation. Some transhumant makes use of crop residues available in the nearby cropping area. The movement of the majority of flocks in the transhumant system is restricted to closed zones compared to the wide range movement of the nomadic flocks where they cover long distances following the availability of pasture and water according to seasons.

- **Livestock landless systems:** Consists of 75% of the country which include the deserts and the extremely with extremely low rainfall and rocky \ steep mountains which are the natural grazing grounds for the millions of sheep, goats and camels in the country (Omer, 2011).
- **Naturally Regenerated forests:** Forests cover mountains region characterized by Mediterranean climate. These mountains are considered the most densely vegetated areas of Iraq because of sufficient rainfall and moderate temperature. The forests cover 70% while grasses and shrubs cover the remaining 30% of the region. Prominent species belong to the genera Quercus and Pinus (Omer, 2011).
- **Self-recruiting capture fisheries:** You can consider the natural and artificial lakes as self-recruiting capture fisheries, and the most important lakes in Iraq are : Al-Tharthar, Habania and Sawah. However the Mesopotamian Marshlands of southern Iraq are one of the most important features of the freshwater and brackish water ecosystems (Ministry of Environment report to CBD, 2010).
- **Culture-based fisheries:** Recently the most dominant kind which very successfully distributed is the Fish Culture in Cages on the Tigris River.
- **Irrigated crops (rice):** Present in south provinces especially Najaf and Qadisiya which produces 55% and 25 % respectively of the total rice production of the country other provinces are Maysan and Thi Qar. Iraq Amber rice is known for its aroma and flavor.
- **Irrigated crops (other):** Wheat, barley and corn are the most planted cereals in the country, vegetables and fruits especially date, and industrial crops like cotton are also planted in the country.
- **Rainfed crops:** Especially wheat in north of Iraq in the plain of Mosul Kirkuk and Erbil.
- **Mixed systems (livestock, crop):** Lands that potentially suitable for agriculture production which is about (120 000 km<sup>2</sup>) or 27% of the total area of the country, there are 40 000 km<sup>2</sup> in the rainfed northern region and the rest in the irrigable areas of the Mesopotamian plains (Omer, 2011). Under these areas integrated

farming systems where animals in the region are mainly grazes on crop residues and natural pastures supplemented by imported cereals and protein.

## **1.2 . STATE, TRENDS AND DRIVERS OF CHANGE OF BIODIVERSITY FOR FOOD AND AGRICULTURE.**

### **A) Description:**

Iraq neither enjoyed political nor economical stability for the last decades, this effects biodiversity state and efforts to documents and to conserve it. However in its efforts to establish cryobanks for animal and plant genetic resources, the Directorates of Animal Genetic Resources and the Seed Testing and Certification issued a data bases for animal and plant genetic resources separately, and the Seed Testing and Certification Directorate kept some of its plant genetic resources outside the country for long- term preservation and inside the country for short – term preservation.

Challenges and threats that can affect biodiversity can be distinguished in two categories: indirect and direct drivers of change (Ministry of Environment report to CBD, 2010).

- Direct Drivers of change:
  1. Urbanization and population increase consider direct drivers of change in our country.
  2. Technology and lifestyle, we can see this direct effect of the catch of fisheries and fish culture in cages which widely spread in the country in the last years.
  3. Artificial inseminations of cattle, threats existence of indigenous cattle breeds.
  4. Degradation: Various large- scale water diversion projects have degraded the Tigris-Euphrates alluvial salt marsh and had major impacts on land use patterns in this region. Beside the decrease in the amount of the rainfall, in the last years.
  5. Sewage and industrial pollution pose a particular threat to freshwater fish and its ecosystem.
- Indirect Drivers of change
  1. Open market policy which filled our markets with imported goods.
  2. Changes in food habits.

### **B) Biodiversity information system.**

Currently, there is no effective national information system in place associated to biodiversity, but efforts led by former Ministry of Environment to evaluate the biodiversity according to CBD requirements and to establish a strategy and action plan is ongoing now.

**C) Biodiversity species that actively managed in production systems for provision of ecosystem services.**

In regard to **Table 2**: currently there is no associated biodiversity species that are actively managed in production system for the provision of ecosystem services.

**D) Wild food species used for food in the country.**

**Table 3.** Wild food species used for food in the country.

<b>Wild food species</b>	<b>Change in state (2,1,0,-1,-2, NK)</b>
Migratory geese	-1
Migratory duck	-1
Persian gazelle Gazelle subgutturosa	-2
Barbus esocinus (wild fish)	-2
Barbus sharpeyi( wild fish)	-1
Barbus luteus( wild fish)	NK
Barbus xanthopterus ( wild fish)	-1
Barbus grypusn( wild fish)	-2
Ilisha Hilsa( wild fish)	-1
Chucker partridge Alectoris Chuckar	NK
Partridge Francolinus Francolinus Black	NK
See see partridge Ammoperdix	NK
Wild goat Capra aegagrus	NK
Dorea's gazelle Gazelle doreas	NK
Gazelle gazelle Mountain gazelle	NK
Deer	-2

**E) The proportion of population that uses wild food on regular basis for food and nutrition.**

Although such information is not officially available, but I can say it is very tiny portion of people inhabiting the marsh land south Iraq and regularly fishing and hunting duck and geese for their food.

#### **F) State, trends and drivers of change affecting biodiversity.**

- There is no monitoring system for biodiversity yet in the country, so I cannot provide you with a summary of the state and trends of any vertebrates or plants or micro-organisms or any other kind of organisms.
- We didn't take an action yet to reduce adverse effects of drivers on associated biodiversity.

#### **1.3 NEEDS AND PRIORITIES.**

- Strategy and action plan.
- Network building inside the country and among stakeholders to implement the action plan and to address all needs for monitor all aspects of biodiversity and to prioritize it needs for conservation and of sustainable use.

#### **2. SUSTAINABLE USE AND CONSERVATION OF BIODIVERSITY FOR FOOD AND AGRICULTURE.**

##### **2.1 SUSTAINABLE USE:**

- A) In regard to **Table 4**, there is no management practice in place to support the maintenance and use of biodiversity for food and agriculture. However we are working now on a regulation (Law for conserving, maintaining and exchange of animal and plant genetic resources and their traditional knowledge), if this law is endorsed and get into action many action plans and practices will build upon it.
- B) Examples on diversity effects on productivity, food security and nutrition, rural livelihood, ecosystem services sustainability, resilience of sustainable intensification.

The situation in our country is not well assessed for each, and action needed to put a plan to address this issue.

- C) Examples of how the use of biodiversity for food and agriculture contributed to cope with climate change, invasive alien species, and natural of human-made disasters.

In regard to **Table 5**, we didn't use biodiversity to cope any of the above aspects.

**D)** List of (ecosystem, landscape, seascape ) approaches that improved the management and use of BFA in the region.

In regard to our country, there is a proposal for conserving the marshland under the name (Mesopotamian Marshlands National Park) and ongoing projects like the (Eden Group New) which head by the Ministry of Environment(Ministry of Environment report to CBD, 2010), which are facing many obstacles for instance absent of national legislation, poor national security, economic instability.

**E)** Examples of activity undertaken to maintain and use traditional knowledge of associated biodiversity and wild foods:

We didn't take an action in this regard but the law for conserving and maintaining animal and plant genetic resources and the traditional knowledge related to it. If this law endorsed and entered in force it will open the door to many actions to take place in this regard.

**F)** Possible needs and priorities in terms of the sustainable use of biodiversity for food and agriculture:

In regard to our country we need the following:

- Rising awareness.
- Policies and regulations
- Institutions and capacity building
- Sustain long-term projects

## **2.2 CONSERVATION**

A) The status of *in situ* conservation of associated biodiversity and wild food species in the country.

The following table provides an overview of most of the key activities and initiatives that have already begun or are proposed for Iraq (Ministry of Environment report to CBD, 2010).

KEY ISSUE	EXISTING ACTIVITIES AND INITIATIVES
BIODIVERSITY RESEARCH AND MONITORING	Key Biodiversity Areas Surveys (KBA) Nature Iraq 2004-2009
	Flora of Iraq project
	Smithsonian Natural History Museum and Bar Code of Life project research on aquatic invertebrates
	Development of draft checklists of birds, mammals, reptiles, amphibians and fish of Iraq, as well as initial development of a plant list based on historical information
INTERNATIONAL CONVENTIONS	Hawizeh Marsh designed as Wetland of International Importance under the Ramsar Convention on Wetlands
	Three UNESCO World Heritage sites in Iraq (Hatra, Ashur and Samarra archaeological city)
PROTECTED AREAS	Al Garbi Breeding Project in Amarah for goitered gazelle ( <i>Gazella subgutturosa</i> ) by the Ministry of Agriculture
	Gazelle breeding project in Rutba by the Ministry of Agriculture
	Barzan tribal reserve in the Iraqi Kurdistan
	Mesopotamian Marshland National Park (under approval)
	Activities towards the designation of the Marshlands as a UNESCO World Heritage Site
	Designation of Hawizeh as a Ramsar Site and development of the Management Plan
	The Ministry of Environment has prepared a draft protected area regulation and has submitted it to the Protected Areas National Committee and to international experts (Syria, Egypt and Italy) for review. The Ministry of Agriculture is developing draft legislation on agricultural protected areas.
	Local tribes in the Abu Zirig Marshlands (Central Marshes) have curtailed the use of unsustainable fishing practices.
	There are some activities related to the development of protected areas in the KRG.
	WATER RESOURCES MANAGEMENT
Dalmaj marsh is managed by Ministry of Agriculture for the supply of brood stock for Bunni ( <i>Barbus sharpeyi</i> ).	
An MoU has been signed between TRI (Twin River Institute) and Ministry of Water Resources-Baghdad & KRG and the Ministry of Agriculture to try to address the following issues related to water resources:	
<ul style="list-style-type: none"> <li>• Establishment of a unified data bank and system.</li> <li>• Assessing the quality of the available data.</li> <li>• Prepare technical reports concerning the water quality of the Euphrates, Tigris, their tributaries and the marshes.</li> <li>• Establishment of rating curves at some key points and stream sites.</li> <li>• Exchange data and information.</li> <li>• Developing a drought management system.</li> <li>• Study the balance between the water availability and demand</li> </ul>	
INVASIVE SPECIES	Management plan for Water Hyacinth ( <i>Eichhornia</i> spp.) in Ministry of Water Resources.
FORESTRY	During previous years the Ministry of Agriculture rented forest lands to local contractors who cut the forest. In 2005, the Ministry of Agriculture stopped this activity and developed, in 2009, a new law for forest protection.
	The Ministries of Environment, Higher Education and Scientific Research, Agriculture and others conducted research in 2005, on the degradation or decline of Iraqi forested areas.
FISHERIES	Fishing moratorium in several lakes during a portion of the year.

B) *Ex situ* conservation status of associated biodiversity and wild food species.

- *Ex situ in vitro* preservation.

The Seed Testing and Certification Directory at the Ministry of Agriculture in Iraq conserving seed and other plant tissue in a plant genebank repository at -18°C for short and medium term preservation, the long-term preservation of plant genetic resources was sent outside the country to an international genebank of the International Center for Agriculture Research in Dry Area (ICARDA). On the other side the Animal Resources Directorate now constructing repository for animal genetic resources preservation, the constructing process now slowing down because of economic crises resulted from the poor security situation and the conflicts with the extreme groups.

- *Ex situ in vivo* preservation.

The Agriculture Research Directorate at the Ministry of Agriculture keeps at its stations some indigenous animal breeds as shown in the table below.

Species	No. of breeds
Poultry	6
Buffalo	1
Sheep	4
Goat	2

C) Needs and priority for conserving biodiversity.

- Financial supports in the form of training of molecular characterization breed genetic improvement and providing advanced equipments.
- Development of management plans for protected areas.
- Establishment of a national net work of protected areas.
- National law for forest management and protection.
- Legislation and practical control concerning invasive species
- Pollution remediation and control.
- Review and update all Environmental legislation.
- Environmental Impact Assessment and Strategic Environmental Assessment policies for biodiversity protection.
- Enhancement and promotion of local, traditional knowledge and practices to sustainably manage the environment and resources.

- Promote activities that generate revenue from sustainable use of nature resources.

## 2.3 ACCESS AND EXCHANGE

- A) In regard to **Table 6:** We don't have a specific system nor measures regulating access and fair and equitable sharing of benefits arising from the utilization of biodiversity.
- B) We need a need a regulation or system governing the access to and ensuring the fair and equitable sharing of benefits arising from the utilization of biodiversity for food and agriculture and for saving biodiversity.

## 3. POLICIES, INSTITUTIONS AND CAPACITY

### 3.1 POLICIES, PROGRAMMES, INSTITUTIONS AND OTHER STAKEHOLDERS

- A) Adopted policies and programmes to support the conservation and sustainable use of biodiversity for food and agriculture.

Existing Iraqi – related legislations (Ministry of Environment report to CBD, 2010).

Reference	Title	Current state and description
2009 – Law No. 30 (formerly 1955 – LAW No. 75)	Forest Law	Updated 2009,Ongoing
1965 – LAW No. 106	Rangelands and their Protection	Ongoing
1976 -LAW No. 48	Fishing, exploitation and protection of living aquatic species	Ongoing
2010 – LAW No. 17 (formerly 1979- LAW No. 21)	Law on the protection of wild animals and birds	Updated in 2010,Ongoing
1997 –LAW No. 3 (formerly 1986 LAW No. 79)	Protection and improvement of environment	Ongoing Updated 2008, Ongoing
2009 – Regulation No. 17 (formerly 1985-Resolution No. 995)	Establishment of aquaculture operations	Ongoing Updated 2009, Ongoing
1991 - Decision No. 1 (EPB)	Cutting of trees	Ongoing
1992 - Instructions No. 11	Prohibition of plant importation into Iraq	Ongoing
2009 – Law No.7	Iraq joining the convention of Desertification	New, Approved
2009 – Law No. 30	Law of Forests and nurseries	New, Approved
2007- Law No. 7	Iraq joining RAMSAR Convention for the wetlands	New, Approved

2007 – Law No. 48	iraq joining the regional commission for Fish traps	New, Approved
2008 – Law No. 31	Iraq joins the Convention for Biological Diversity	New, Approved
2015-Regulation No. 2	GMO Biosafety regulation	New, Approved

In addition to the above more specific law are proposed for the conservation of plant and animal genetic resources for food and agriculture and are on their way for approval.

**B) Short analysis of the strengths and weakness and the level of implementation:** It is hard to tell at this stage but the level of implementation not as perfect as we wish because of the poor security situation of the country.

**BOX 3:**

- **Nature Iraq, which is a NGO, successfully, surveyed the north find and to conserve the important indigenous wild goat (Capra aegagrus) and effectively raising public awareness on conserving biological diversity importance.**
- **The small animal holders play an important role in keeping their indigenous animals regardless their poor productivity, and the traditional knowledge and heritage you can find it with them.**

**C) Successful inter ministerial cooperation in the area of conservation and sustainable use of biodiversity and the relevant collaboration mechanisms.**

- We have two multi ministerial committee' in the ministry of agriculture deals with this issue head by the Advisor of the Minister, these committees scribed the law of conserving animal the plant genetic resources.
- The Ministry of Health head multi ministerial committee for biosafety in regard to Cartagena protocol for biosafety and conserving biological diversity.

**D) Possible needs and priorities in terms of policies, programmes and institutional governing biodiversity:**

- We animal genebank data operating system.

- We need system for risk assessment of genetically modified organisms for the health and its threats to the biodiversity and environment.
- We need a programme for access and benefit sharing.

### 3.2 CAPACITY

A) Training and education needs that target the conservation and sustainable use and possible constraints.

<b>Training</b>	<b>constraints</b>
Tissue long term preservation	<ul style="list-style-type: none"> <li>• The animal genebank not operated yet and the knowledge may lose.</li> </ul>
Embryo dividing, multiplying and transfir	<ul style="list-style-type: none"> <li>• The genebank not operated yet and the knowledge may lose.</li> <li>• Shortage in specialists employees</li> <li>• Shortage in needed equipments</li> </ul>
Long- term seed preservation	<ul style="list-style-type: none"> <li>• Need special tanks and repository</li> </ul>
Long –term egg preservation	The animal genebank not operated yet and the knowledge may lose.

B) Research needed to strengthen the conservation and sustainable use of associated biodiversity and possible constraints

<b>Research</b>	<b>constraints</b>
Whole genome sequences and phylogenetic studies	<ul style="list-style-type: none"> <li>• Local genome should be compared to others internationals ones for this study.</li> <li>• Shortage in specialists and equipments</li> <li>• For the results to be accepted internationally it should be done in cooperation with well known high reputation institute.</li> </ul>
Genetic structure and diversity studies with SNP- chip technique.	<ul style="list-style-type: none"> <li>• Shortage in specialists and equipments</li> </ul> <p>For the results to be accepted internationally it should be done in cooperation with well known high reputation institute.</p>

## 4. REGIONAL COOPERATION

### 4.1 REGIONAL INITIATIVES THE COUNTRY IS INVOLVED IN TO CONSERVE AND USE BIODIVERSITY FOR FOOD AND AGRICULTUR.

**Table 7. Regional Policies and programmes.**

<b>Regional policies and programmes</b>	<b>Description</b>
Plant Genetic Resources Data Sharing with the Network of the Arab Organization For Agriculture Development.	Started recently at the end of 2015 and the Seed Testing and Certification Directorate started to enter their seed data collection into it.

## **4.2 NEEDS AND PRIORITIES**

A) Possible needs and priorities in term of embedding biodiversity for food and agriculture.

- Network building and research collaboration with relevant institutions across the region.
- Master project for monitoring and conservation across the region

## **5. SYNTHESIS OF NEEDS AND PRIORITIES AND THE POSSIBLE WAY FORWARD**

<b>Priority areas</b>	<b>Needs and priorities</b>	<b>Possible actions to be undertaken</b>
1. Assessment and monitoring	Training , funding , collaboration	<ul style="list-style-type: none"> <li>• Action plan for regional collaboration.</li> <li>• Regional and multinational research collaboration.</li> <li>• Network building</li> </ul>
2. Conservation and sustainable use	Training, funding , collaboration	<ul style="list-style-type: none"> <li>• Policies and regulation building</li> </ul>
3. Policies, institutions and capacity	<ul style="list-style-type: none"> <li>• Risk assessment system</li> <li>• System for access and benefit sharing</li> </ul>	<ul style="list-style-type: none"> <li>• Assign working group to generate such programmes</li> </ul>
4. Regional and international cooperation	Training , funding , collaboration	<ul style="list-style-type: none"> <li>• Network building for research collaboration</li> <li>• Master multinational project.</li> </ul>

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