





# Integrated Management Plan for Meighan Wetland

Prepared In Cooperation with  
Governmental Organizations, NGOs  
and Local Communities of Meighan Wetland



Conservation  
of Iranian Wetlands Project



*Department of Environment*  
Markazi Department  
of Environment

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## In the name of the creator of nature

### 1. Introduction

Meighan Wetland is one of the highest salt flats in the center of the country and it is located about 8 km northeast of Arak city. This wetland is one of the most important habitats of native and migratory birds in the central of the country, and in winter it is stopover for large groups of migratory birds includes Common Crane which migrate from cold northern regions to the tropical southern lands. Meighan desert wetland, due to its proximity to Arak metropolis has a direct impact on the quality of water and air in this city. Meighan Wetland has indicated as a hunting prohibited area, by pursuing of Markazi Province Department of Environment in autumn 2008. This wetland has undergone some changes because of occurrence frequent droughts especially in recent years, building numerous earth dams in the upstream catchment basin, intensified exploitation of underground aquifers in surrounding areas, expansion of industries in its surroundings, changes in land use, mining, heavy grazing and other factors, which it will suffer irreparable losses if it receive no attention.

Following to select Meighan Wetland as a pilot site to transfer experiences of Conservation of Iranian Wetlands Project, Integrated Management Plan for Meighan Wetland has proposed during the three-year expert common work (2014 to 2016 years) and four consultative workshops.

This plan, after discussing and being approved in working group of Integrated Management Plan for Meighan Wetland and also being approved in planning council of Markazi Governorship, has communicated to all provincial executive agencies in a letter No. 879235 dated December 5,

2016. The plan aims to create a single framework for planning and operating of the related national, provincial and local institutions in the catchment basin area, with taking into consideration the principles of the ecosystem management, regarding the important of, and the special and crucial ecological conditions of Meighan Wetland. Executive summary of the Integrated Management Plan for Meighan Wetland which is for facilitating study, making decision and also management decision making, is as follows.

## **2. The process of proposing Integrated Management Plan for Meighan Wetland**

Conservation of Iranian Wetlands Project has been defined and operationalized since 2005 year with participation of Department of Environment as a national reference, United Nations Development Programme (UNDP), and Global Environment Facility (GEF), aiming to reduce or eliminate persistent threats and in general to sustain and survive environment, and to provide optimum conditions of management of this precious natural ecosystem. Integrated Management Plan for Iranian Wetlands firstly has been proposed for three important wetlands of the country including the Urmia Lake, Shadegan Wetland, and Parishan Wetland. A participatory strategic approach is used in preparation of management plan for the three wetlands. In continuance of this process in order to build capacity, to establish management system and to transfer resulted experiences of it, 7 wetlands of the country were selected to establish a management system on them based on ecosystem approach, in the development phase of the achievements of Conservation of Iranian

Wetlands Project. According to specified criteria, the program must be submitted to highest decision making body in the province and after its approval, communicated to implementers and involved persons within the province to implement it. Meighan Wetland is one of the selected wetlands.

The participatory strategic approach has been used to preparation and proposition Integrated Management Plan for Meighan Wetland. In order to exchange opinions and information among the various beneficiaries and proposing the draft of Integrated Management Plan for Meighan Wetland, four workshops held with the participation of all related provincial groups and with technical support of Conservation of Iranian Wetlands Project during 2014 to 2016 years. In each of these workshops, more than 50 representatives of the executive agencies, academic institutions, NGOs and local communities were attended and took an active participation in its debates.

The first workshop was held over two days in June 2014. The first day was devoted to a field visit of the wetland and on the second day, subjects including wetland values and functions, problems and threats facing the wetland, beneficiaries, perspective and objectives of proposing the program were studied. In December 2014, supplementary workshop on analysis of beneficiaries was held aiming to determine and complete final list of the beneficiaries of the wetland. The second workshop of proposing Integrated Management Plan for Meighan Wetland was held for 2 days in June 2015. In this workshop the present problems and threats of Meighan Wetland was categorized and analyzed; as well as two supplementary expert meetings were held in August 2015 with the participation of main and key beneficiaries. The third workshop of proposing Integrated Management Plan



for Meighan Wetland was held in December 2015 in Islamic Azad University of Arak. On its first day, strategic objectives tables were reviewed and completed, and on its second day, structure of provincial working groups and local communities of Integrated Management Plan for Meighan Wetland, and the structure of proposing programs and the wetland's monitoring protocols were prepared. The fourth workshop was held on May 2016 in Islamic Azad University of Arak with the aim of zoning the wetland and determining permitted uses of each zone.

The present document, as a final version of Meighan Wetland's management plan is resulted of the mentioned four workshops, received complementary and modified opinions of the beneficiaries, doing complementary studies, and holding professional meetings about different aspects of Integrated Management Plan for Meighan Wetland, which is provided by experts of Conservation of Iranian Wetlands Project, experts of Markazi Province Department of Environment, faculty members of Islamic Azad University of Arak and also in collaboration with government agencies, NGOs and local communities of Meighan Wetland.

### 3. Summary of Meighan Wetland features

#### 3.1. Physical characteristics

Catchment basin of Meighan Wetland with an area of 549578 ha is located at 33°49'29" - 34°44'52" N and 49°22'13" - 50°17'55" E, it's as a closed bowl between Zagros and Central Iran mountains and all of its area is located in Markazi Province. A large part of the basin area of about 353800 ha is assigned to the plain and the rest is foothill and mountain. Average annual rainfall of Meighan Wetland catchment basin is 287 mm.

Meighan Wetland is located in center of Iran at a distance about 8 km northeast of Arak metropolis and 5 km southwest of Davudabad city. This wetland is a seasonal saltwater lake and a lowland desert area, and its marginal lands has covered by halophyte bush and shrub plants, sand dunes, alluvial fans and smooth plains. According to long-term climate data (1958 to 2015) from Arak Synoptic Weather Station, average annual rainfall of the station has been 308 mm; prevailing winds have been from the west and southwest direction; maximum of occurred wind speed has been 123 km/h; average annual evaporation of 2036 mm; the highest and lowest temperature records have been -30.5 and +44°C, respectively; average annual temperature has been 14 °C; average relative humidity in winter and summer have been 63 and 28%, respectively, and average annual humidity has been 46%; duration of dry period of 150 days a year (from early June to early November); and the average of annual sunshine hours of 2993 h. Climate of the rejoin is semi-arid, and cold arid by De-Martons and Emberger's classification, respectively.

Meighan Wetland with an elevation of 1660 meters above sea level is one of the Iranian highest salt flats. Meighan Wetland area due to water

flowing to it varies from 8178 to 12012 ha and its perimeter varies from 40 to 51 km. During wet period of the year and the wetland dewatering time, the water depth in its different areas fluctuates between 1 to 150 cm, and in dry season of the year, generally free water evaporates and the wetland surface in deeper areas comes in swamp form, in most areas it comes in wet salt marsh form, and in some part of north of the wetland it comes in clay flat form. The wetland water supply resources constitute of atmospheric precipitation, water of entry waterways from eight sub-basins, springs scattered on the bed of the lake, and Arak wastewater treatment plant effluent.

### 3.2. Natural environment

Catchment basin of Meighan Wetland in terms of phytogeography is a part of the territory of Iran-Turan that has various hydrohalophyte vegetation types around the wetland which are specific to desert land areas, and its next ring -including plains around Playa, contains steppe vegetation types, and in upstream mountainous area of the catchment basin, it contains types of semi-steppe areas.

Being on the path of 22 international wetlands and 105 Important Birds Area (IBA) is one of the most prominent features of Meighan Wetland. Meighan Wetland and surrounding plains are of the most important habitats of native and migratory birds in the Markazi Province. This wetland is a permanent or temporary habitat and a refreshing place for migratory birds in the center of the country and in winter it is stopover for large groups of the migratory birds which migrate from cold northern regions to tropical southern lands. Meighan Wetland with a population of more than 10

thousand pieces of Common Crane, in the cold season is one of the best overwintering habitats of this bird in the center of the country. It has been reported that in Meighan Wetland hunting prohibited area generally there are 154 species of 4 animal classes, including 16 mammal species, 102 bird species, 32 reptile species, and four amphibian species.

### **3.3. Human environment and administrative structure**

According to 2011 Population and Housing Census of Statistical Center of Iran, catchment basin of Meighan Wetland with a population about 650 thousand people is the most densely populated area of Markazi Province. In terms of extent, this basin includes 18.8 percent of the province area but in terms of the population includes about 46 percent of the province population. Arak Metropolis as the most important settlement in Markazi Province with a population of 526,182 people is located in the basin. Ashtian (population of 9015 people), Farmahin (population of 4297 people), Karchan (population of 3752 people), Saruq (population of 1386 people), and Davudabad cities (population of 5,252 people) are also in this catchment basin. Much areas of Arak and Farahan counties and many areas of Ashtian and Komijan counties are located in this catchment basin .

The population of Meighan Wetland's local and native communities are 10638 people that are resided in Davudabad city and Dehnamak, Sahlabad, Mobarakabad, Taramazd, Rahzan, Meighan, Moradabad, Mashhad-e Meighan, Eybakabad and Vismeh villages. The main source of income of the local communities is from agriculture and animal husbandry.

Summary of Meighan Wetland features is presented briefly in Table 1.

Table 1. Summary of Meighan Wetland features

| Subject   | Description   |
|---|---|
| Name  | Meighan wetland   |
| Location  | 34°08'- 34°16' N and 49°45'- 49°55' E   |
| Wetland area  | Between 8178 to 12012 ha  |
| Catchment basin area  | 549578 ha equivalent to 5495.78 km <sup>2</sup>   |
| Elevation   | 1660 m. amsl  |
| Average annual precipitation                                  | 287 mm for the catchment basin and about 260 mm for the wetland   |
| Management position   | The wetland manages by Markazi Province Department of Environment   |
| Conservation status   | Since 2008, the wetland has indicated as a hunting prohibited area, and now it is applying for increasing level   |
| Land tenure   | State owned along with individual irrigated and rainfed agricultural lands surrounding the wetland and the lands transferred to industrial sectors  |
| Land use  | Wetland/ water body, natural and handy planted rangeland and desert areas, irrigated and rainfed agricultural lands, industrial areas, mining areas, airport, township wastewater treatment plant, human settlements  |
| Main sources of water   | Rainfall, surface runoffs from the catchment basin, springs scattered on the lake's bed, Arak wastewater treatment plant effluent   |
| Type of the wetland based on Ramsar Convention Classification | Lacustrine or lake  |
| Main ecological values  | Diverse wetland habitats, the most important overwintering habitat for Common Crane ( <i>Grus grus</i> ) in the center of the country, the most prominent habitat of <i>Nitraria schoberi</i> shrub in the country, being located on the path of 22 international wetlands in the north and south of the country, having populations of waterfowls and shorebirds with global importance, Artemia habitat |
| Wetland products  | Waterfowls and shorebirds, sodium sulfate, Artemia, forage, medicinal plants, Cattail and reeds   |
| Wetland functions   | Supporting of biodiversity; view and landscape; recharging underground aquifers; climatic moderation; reducing pollutions; preventing the formation of hazes production hotspot; controlling wind erosion; carbon sequestration   |
| Services  | Ecotourism, recreations, education, scientific researches, cultural values  |
| Most important plant species                                  | <i>Nitraria schoberi</i> , <i>Halocnemum strobilaceum</i> , <i>Pucciniella bulbosa</i> , <i>Aeluropus litoralis</i> , <i>Salsola incanescens</i> , <i>Camphorosma monspeliacum</i> , <i>Limonium iranicum</i> , <i>Salicornia herbacea</i> , <i>Phragmites australis</i> , <i>Atriplex verrucifera</i> , <i>Haloxylon persicum</i> , <i>Lycium ruthenicum</i>   |
| Most important aquatic species                                | Artemia ( <i>Artemia parthenogenetica</i> ), Unicellular Alga ( <i>Dunaliella salina</i> )  |

Table 1. (cont'd)

| Subject                       | Description  |
|-------------------------------|--|
| Most important animal species | <p>Birds: Common Crane (<i>Grus grus</i>), Greylag Goose (<i>Anser anser</i>), Ruddy Shelduck (<i>Tadorna ferruginea</i>), Common Shelduck (<i>Tadorna tadorna</i>), Teal (<i>Anas crecca</i>), Mallard (<i>Anas platyrhynchos</i>), Common Redshank (<i>Tringa totanus</i>), Armenian Gull (<i>Larus armenicus</i>), Flamingo (<i>Phoenicopterus ruber</i>), Eurasian Coot or Common Coot (<i>Fulica atra</i>), Common Ringed Plover (<i>Charadrius hiaticula</i>), Marsh Harrier (<i>Circus aeruginosus</i>), Lapwing (<i>Vanellus vanellus</i>), Pied Avocet (<i>Recurvirostra avosetta</i>), Black-winged Stilt (<i>Himantopus himantopus</i>), Collared Pratincole (<i>Glareola pratincola</i>), Grey Heron (<i>Ardea cinerea</i>), Water Rail (<i>Rallus aquaticus</i>)</p> <p>Mammals: Marbled Polecat (<i>Vormela peregusna</i>), Indian Crested Porcupine (<i>Hystrix indica</i>), Brandt's Hedgehog (<i>Paraechinus hypomelas</i>), Wolf (<i>Canis lupus</i>), Golden Jackal (<i>Canis aureus</i>), Common Fox or Red Fox (<i>Vulpes vulpes</i>), Rabbit (<i>Lepus europaeus</i>), Rat (<i>Rattus sp.</i>)</p> <p>Reptiles and amphibians: Persian toad - headed agama (<i>Phrynocephalus persicus</i>)</p> <p>Mediterranean Spur-thighed Tortoise (<i>Testudo graeca</i>)</p> |
| Major ecological changes      | <p>Physical destruction of the big island 's habitats due to mining activities, creation of permanent pond with an area of 200 ha in the pits of extraction mineral sodium sulfate, upset of the hydraulic balance of the wetland due to construction of 4 km access road from the mine in the middle of the wetland, becoming some part of the saltwater wetland to the freshwater wetland and creation of marsh new ecosystems because of Arak wastewater treatment plant effluent entry as the most important wetland 's water supply in recent years, reducing water level in underground aquifers around the wetland and upsetting the balance of salt and fresh water in the aquifers due to indiscriminate extraction of underground water from wells around the wetland, rapid changes in land use in the wetland 's south habitats through transferring rangeland areas to the aluminum company, airport and wastewater treatment plant, and creation of critical hotspot of wind erosion in north marginal lands of the wetland</p>  |

### 3.4. Wetland values and threats

#### Wetland values and threats

| Wetland values   | Wetlands threats   |
|--|--|
| Protection of biodiversity and genetic supply<br>Habitat value<br>Hydrological value<br>Climate moderation and freshen<br>Refining and absorbing pollutants<br>Reduction and sequestration wind sediments,<br>fixing salt deposits and carbon sequestration<br>Supplying forage for livestock<br>Extraction of Sodium Sulphate<br>Medical and industrial herbs<br>Fishery values<br>Aesthetic, Ecotourism and cultural values<br>Study, research and education | Competition in water resources use and allocation<br>Water and soil pollution<br>Reduction of water inflows<br>Reduction of flow of underground water<br>Disruption and disturbance for wildlife<br>Uncontrolled tourism<br>Desertification and wind erosion<br>Climate changes<br>Management problems<br>Land-use change and creating turbulence in the<br>wetland habitats<br>Disruption in hydrodynamics of the wetland<br>Illegal hunting of birds and wildlife<br>Destruction of vegetation |

## 4. Management Plan

### 4.1. A 25 year vision for Meighan Wetland

#### 25 Year vision for Meighan Wetland

*Meighan Wetland is a sustainable and dynamic ecosystem, with adequate and healthy water, and rich biodiversity, having particular regional and international importance which is provider of welfare and health of the local communities and the life of its alive creatures.*

#### 4.2. Overall management goal



#### 4.3. Strategic objectives

In order to achieve the overall goal and 25-year vision of management plan for Meighan Wetland, 6 strategic objectives was determined in consultative workshops to propose integrated management for Meighan Wetland, for managing the wetland. Details of these goals with priority actions to achieve them and also responsibilities of various departments are described in the following tables. The following keys refer to the responsible organization:

- DOE Department of Environment
- AJO Agriculture Jihad Organization
- DNRW Department of Natural Resources & Watershed
- MRWA Markazi Regional Water Authorities
- MPWWC Markazi Province Water & Wastewater Co.
- MPG Markazi Province Governorship
- MPOMP Management & Planning Organization of Markazi Province
- DRUD Department of Roads & Urban Development
- DIMT Department of Industry, Mine & Trade
- URCP Universities & Research Centers of Province
- NGOs Non-Governmental Organizations



LC Local Communities

AM Arak Municipality

IEC Industrial Estates Corporations

JA Judicial Authorities

DRD Deeds Registration Department

MPFM Markazi Province Fisheries Management

UWWC Urban Water & Wastewater Co.

MPCHTO Markazi Province Cultural Heritage & Tourism Organization

AUMS Arak University of Medical Sciences

MO Meteorological Organization

HF Housing Foundation

OPTC Oil Pipeline & Telecommunication Company

ADM; RMAW Arak & Davudabad Municipalities; Rural Municipalities

#### Around the Wetland

MSC Mineral Salts Co.

BMM Broadcasting & Mass Media

MPVS Markazi Provincial Veterinary Service

DCLSW Department of Cooperatives, Labour & Social Welfare

AGDG Arak Government & District Governments

MPTWG Markazi Province Tourism Working Group

MPCO Markazi Province Cooperative Office

**Objective 1: Sustainable and integrated management of water and soil resources**

| Priority issues                          | Targets   | Priority actions  | Responsible agent (R)<br>Partner agent (P)                                 |
|--|---|---|--|
| Integrated management of water resources | <p><b>5 years:</b><br/>Providing at least 50% of environmental water requirements of the wetland</p> <p><b>25 years:</b><br/>Providing at least 100% of environmental water requirements of the wetland</p> | <p>1.1. Determination of environmental water requirements of the wetland</p> <p>1.2. Approving needed water right of the wetland</p> <p>1.3. Studying and fixing allocation of Arak wastewater treatment plant effluent to Meighan Wetland</p> <p>1.4. Study the environmental effects of Arak wastewater treatment plant effluent to Meighan Wetland</p>   | <p>R: DOE</p> <p>P: MRWA, MPWWC</p>  |
|  |   | <p>1.5. Blocking all unauthorized wells in the wetland privacy</p> <p>1.6. Installation of smart meters on allowed wells</p> <p>1.7. Lack of water allocation to water user industries in the catchment basin of the wetland</p> <p>1.8. Review of the present allocation in the basin in order to provide the wetland 's water right</p> <p>1.9. Applying integrated management of water resources in the catchment basin to provide the wetland 's water right</p> <p>1.10. Reforming methods related to water resources use</p> <p>1.11. Collecting surface waters and reforming waterways of the wetland area in order to better direct the runoff toward the wetland</p> | <p>R: MRWA</p> <p>P: DOE, AJO, DNRW, MPG, DIMT, JA, NGOs, LC, ADM, IEC</p> |
|  |   | <p>1.12. Study water allocation of earth dams of Meighan Wetland catchment basin and its effects on the wetland ecosystem</p> <p>1.13. Allocation wetland 's water share from earth dams</p> <p>1.14. Reforming drainage system of the wetland catchment basin, and reviewing watershed plans in order to provide the wetland 's water right</p> <p>1.15. Avoiding to construct any structure for water storage in upstream watersheds, including Gerdou Valley</p>   | <p>R: DNRW</p> <p>P: DOE, AJO, MRWA, MPWWC</p>                             |

**Objective 1 (cont'd): Sustainable and integrated management of water and soil resources**

| Priority issues                          | Targets   | Priority actions  | Responsible agent (R)<br>Partner agent (P)                        |
|--|---|---|---|
| Integrated management of water resources | <p><b>5 years:</b><br/>Providing at least 50% of environmental water requirements of the wetland</p> <p><b>25 years:</b><br/>Providing at least 100% of environmental water requirements of the wetland</p> | 1.16. Allocation of Wastewater Reuse of Eybakabad and Kheirabad industrial estates in order to green fields development in the area and surrounding of this estates   | R: IEC<br>P: DOE, MPWWC, DIMT                                     |
|  |   | 1.17. Establishment of sustainable agriculture, including reforming irrigation methods and reducing area under cultivation and changing agricultural cropping pattern   | R: AJO<br>P: DOE, MRWA, NGOs, LC                                  |
|  |   | 1.18. Review of land use studies of the province in catchment basin of Meighan Wetland in order to provide wetland's water requirements   | R: MPG, MPOMP<br>P: DOE, AJO, MRWA, MPWWC, DRUD, DIMT, URCP, NGOs |
| Integrated management of soil resources  | <p><b>5 years:</b><br/>Improvement 50% of the catchment basin vegetation</p> <p><b>25 years:</b><br/>Full preventing the soil erosion process</p>   | <p>2.1. Estimation amount, sources and types of soil erosion in the catchment basin of the wetland</p> <p>2.2. Doing watershed mechanical operations such as gabion packing and making dry stone to control waterway erosion</p> <p>2.3. Doing biological operations such as planting adapted and native plants around waterways leading to the wetland</p> <p>2.4. Establishment of sustainable agriculture, including doing conservative tillage, sustainable agricultural extension and education to farmers, and preventing land use change</p> | R: AJO, DNRW<br>P: DOE, MRWA, LC                                  |
| Land ownership                           | <p><b>5 years:</b><br/>Fixing the wetland boundary by benchmark</p> <p><b>25 years:</b><br/>Obtaining official document of the wetland</p>  | <p>3.1. Determining quality and quantity privacy of the wetland</p> <p>3.2. Determining ecological privacy of the wetland</p> <p>3.3. Implementation of fixing operation of the wetland boundary through installation benchmark</p> <p>3.4. Implementation of process of obtaining document related to the wetland range during a participatory process</p>   | R: DOE, MRWA<br>P: AJO, DNRW, LC, JA, DRD                         |

**Objective 2: Management and control of pollution related to the wetland**

| Priority issues                                  | Targets  | Priority actions   | Responsible agent (R)<br>Partner agent (P)                               |
|--|--|--|--|
| Air pollution (hazes resulting from the wetland) | <p><b>5 years:</b><br/>40% Reduction in hazes production hotspots in the range of the wetland</p> <p><b>25 years:</b><br/>80% Reduction in hazes production hotspots in the range of the wetland</p> | <p>1.1. Doing studies in the field of identification haze production hotspots in the range of the Meighan Wetland and how to control them</p> <p>1.2. Controlling haze production hotspots caused by mining activities of Mineral Salts Company</p> <p>1.3. Examining the possibility of distribution of Arak wastewater treatment plant effluent at some point of the wetland in order to control and reduce hazes</p> <p>1.4. Doing studies in the field of study annual changes process in Meighan Wetland's water level and its impact assessment on arak city air pollution</p> | <p>R:DOE,<br/>DNRW<br/>P:MRWA,<br/>MPWWC,<br/>MPG,<br/>URCP,<br/>MSC</p> |
|  |  | <p>1.5. Doing management measures such as conservation, restoration and development of suitable vegetation; constructing biotic and abiotic windbreak; and mulching in order to harness wind erosion hotspots and haze production sources</p>  | <p>R: DNRW<br/>P: DOE</p>  |
| Soil pollution                                   | <p><b>5 years:</b><br/>40% Reduction in soil pollutant hotspots in the range of the wetland</p> <p><b>25 years:</b><br/>100% Reduction in soil pollutant hotspots in the range of the wetland</p>    | <p>2.1. Identifying sources of soil pollution</p> <p>2.2. Controlling sources of soil pollution based on done studies</p> <p>2.3. Preventing to leave carcass of domestic animals in the wetland area</p> <p>2.4. Preventing the entry of industrial and household waste into the wetland area</p>   | <p>R: DOE<br/>P: AJO,<br/>DIMIT,<br/>ADM,<br/>RMAW,<br/>IEC</p>          |

## Objective 2 (cont'd): Management and control pollution related to the wetland

| Priority issues                                | Targets  | Priority actions  | Responsible agent (R)<br>Partner agent (P)             |
|--|--|---|--|
| Water pollution                                | <p><b>5 years:</b><br/>Reduction of water pollutants entering into the wetland as much as 60% compared to the year 2016</p> <p><b>25 years:</b><br/>Reduction of water pollutants up to the standards of Department of Environment</p>                   | <p>3.1. Separation of industrial wastewater collection and treatment system (especially Arak heavy industries) from Arak township wastewater because of increased risk of heavy metals in the wetland's soil and water</p> <p>3.2. Identifying the sources of water pollutant</p> <p>3.3 Preventing the entry of untreated effluents into the wetland</p> <p>3.4. Preventing the entry of agricultural effluents contaminated by fertilizers and pesticides into the wetland</p>  | <p>R: DOE, MPWWC<br/>P: AJO, DNRW, MRWA, ADM, RMAW</p> |
| Noise, electromagnetic and radiation pollution | <p><b>5 years:</b><br/>Reduction of noise intensity to eliminate the disruption caused in the habitats of birds and other wildlife species</p> <p><b>25 years:</b><br/>Reduction of noise intensity up to the standards of Department of Environment</p> | <p>4.1. Identifying the sources of noise, electromagnetic and radiation pollutions in the range of the wetland</p> <p>4.2. Reduction and elimination of pollutant sources based on studies</p> <p>4.3. Reduction of pollution caused by vehicles transportation in the range of the wetland by blocking unnecessary dirt roads</p> <p>4.4. Identifying animal colonies sensitive to noise pollution</p> <p>4.5. Monitoring the airport in its active periods by department of environment, and doing necessary measures to reduce disruptions caused by flying in the wetland ecosystem</p> | <p>R: DOE, DRUD<br/>P: DNRW, DIMT, AUMS, LC</p>        |

**Objective 3: Conservation and restoration of biodiversity of Meighan Wetland**

| Priority issues  | Targets  | Priority actions  | Responsible agent (R)<br>Partner agent (P)   |
|--|--|---|--|
| <p>Conservation of the wetland's animal species, especially (Artemia, Common Crane, Flamingo, Houbara Bustard, Sociable Lapwing or Sociable Plover, White-Headed Duck, Black Stork, Armenian Gull)</p> | <p><b>5 years:</b><br/>                     - If Armenian Gull breeding population reaches to 30 pairs<br/>                     - If the number of Artemia cyst in the wetland area increases as much as 10% compared to the year 2016<br/>                     - If the population of Common Crane doesn't less than it's of the 2015 year (9000 pieces)</p> <p><b>25 years:</b><br/>                     - If Armenian Gull breeding population reaches to 70 pairs<br/>                     - If the number of Artemia cyst in the wetland area increases as much as 25% compared to the year 2016<br/>                     - If the population of Common Crane reaches to 12000 pieces</p> | <p>1.1. Studying and evaluating Artemia reserves and preparing its distribution and frequency map in the wetland<br/>                     1.2. Evaluating Unicellular Alga Dunaliella population (as a main food of Artemia) and preparing its distribution and frequency map in the wetland</p>  | <p>R: MPFM<br/>                     P: DOE, URCP</p>   |
|  |  | <p>1.3. Studying ecological capacity and potential of the wetland and determining ways to its development<br/>                     1.4. Supporting research and projects related to biodiversity<br/>                     1.5. Preventing hunting and fishing<br/>                     1.6. Providing food for birds on time in the ice season<br/>                     1.7. Informing and raising awareness about value of the wetland's animal species<br/>                     1.8. Proposing and implementing a program to treat and release injured and sick wildlife<br/>                     1.9. Equipping regional environmental monitoring stations with sufficient manpowers and facilities to strengthen law enforcement and conservation of the area</p> | <p>R: DOE<br/>                     R: DNRW, MPG, MPCHTO, MPFM, ETO, URCP, NGOs, LC, BMM, MPVS, MPOMP, JA</p> |

**Objective 3 (cont'd): Conservation and restoration of biodiversity of Meighan Wetland**

| Priority issues                                  | Targets   | Priority actions  | Responsible agent (R)<br>Partner agent (P)           |
|--|---|---|--|
| Conservation of birds and other wildlife habitat | <p><b>5 years:</b><br/>Increasing conservation level of the area to national level</p> <p><b>25 years:</b><br/>Increasing conservation level of the area to international level</p>   | <p>2.1. Securing habitats and reducing human interventions in the wetland area</p> <p>2.2. Preserving and biological operation in southern, western and north around part, up to 200 meters of water tail</p> <p>2.3. Non-issuance of any license for establishment, exploitation and development of industries, and so on in aquatic and terrestrial habitats in the range of the wetland</p> <p>2.4. Avoiding unsustainable tourism</p> | <p>R: DOE, DNRW</p> <p>P: MPCHTO, DIMT, NGOs, LC</p> |
| Vegetation                                       | <p><b>5 years:</b><br/>Conserving and restoring vegetation in natural areas around the wetland as much as 70%</p> <p><b>25 years:</b><br/>Total conserving and restoring vegetation in natural areas around the wetland</p> | <p>3.1. Preparing vegetation map of the wetland area (scale 1: 30,000)</p> <p>3.2. Restoring vegetation using native species</p> <p>3.3. Preventing fire in the range of the wetland</p> <p>3.4. Identifying threats facing vegetation</p> <p>3.5. Constructing necessary infrastructures to deal with natural disasters</p> <p>3.6. Monitoring and preventing overgrazing, especially in preserved areas</p>                             | <p>R: DOE, DNRW</p> <p>P: URCP, NGOs, LC, MSC</p>    |

**Objective 4: Promoting sustainable livelihood in local communities around the Meighan Wetland in order to conserve it**

| Priority issues  | Targets  | Priority actions   | Responsible agent (R)<br>Partner agent (P)                                |
|--|--|--|---|
| Unsustainable livelihood of local communities around the wetland | <p><b>5 years:</b><br/>Introduction and establishment program for alternative/supplementary livelihood has approved and at least it has reached to 30% of its goals</p> <p><b>25 years:</b><br/>Full implementation of the program for alternative/supplementary livelihood in order to conserve the wetland</p> | <p>1.1. Studying and identifying alternative/supplementary livelihood for local communities around the wetland</p> <p>1.2. Proposing and implementing introduction and establishment program for alternative/ supplementary livelihood related to the wetland</p> <p>1.3. Implementation of at least two pilots of alternative/supplementary livelihood in villages around the wetland</p>   | <p>R: MPG<br/>P: DOE, AJO, DNRW, MPCHTO, NGOs, LC, DCLSW</p>              |
| Unsustainable and uncontrolled tourism                           | <p><b>5 years:</b><br/>Integrated management plan for natural tourism (ecotourism) has approved and at least 40% of its goals has achieved</p> <p><b>25 years:</b><br/>Full implementation of the integrated management plan for natural tourism (ecotourism) in the region</p>                                  | <p>2.1. Proposing integrated plan for natural tourism (ecotourism) management with participation of local communities</p> <p>2.2. Developing and constructing ecotourism infrastructures with participation and investment of local communities</p> <p>2.3. Studying effects of ecotourism on local communities (with an emphasis on local communities' livelihood)</p> <p>2.4. Education and empowerment of local communities and tourism offices to participate in development of sustainable ecotourism</p> | <p>R: MPCHTO, MPTWG<br/>P: DOE, AJO, MPG, DNRW, NGOs, LC, DCLSW, AGDG</p> |



**Objective 5: Reducing the negative effects of the present industries on the wetland**

| Priority issues                                      | Targets   | Priority actions  | Responsible agent (R)<br>Partner agent (P)  |
|--|---|---|---|
| Non normative exploitation of the mine               | <p><b>5 years:</b></p> <ul style="list-style-type: none"> <li>- Reducing the negative effects of mining exploitation on the wetland at a rate of 80%</li> <li>- Restoring damaged parts resulting from mining at a rate of 50%</li> <li>- Non-exploitation of mineral resources of small island because of its environmental values and being pristine</li> </ul> <p><b>25 years:</b></p> <ul style="list-style-type: none"> <li>- Full stopping the exploitation of the mine from the wetland</li> <li>- Full restoring damaged parts resulting from mining</li> </ul> | <p>1.1. Preventing any development of Iran Mineral Salts Company activities</p> <p>1.2. Doing studies to investigate the effects of mining exploitation on the wetland ecosystem and local communities</p> <p>1.3. Preparation and implementation of action plan in cooperation manner to reduce the effects of exploitation of the mine on the wetland</p> <p>1.4. Preventing to disrupt the wetland bed</p> <p>1.5. Organizing wet and mineral wastes</p> <p>1.6. Removing the inner road of the wetland and studying alternative methods to transport minerals from the mine to the factory without road</p> <p>1.7. Reconstructing and reforming excavated pits (returning the wastes to the excavated sites)</p> <p>1.8. Banning exploitation of mineral resources from small island</p> <p>1.9. Non-renewal of mining license of Iran Mineral Salts Company</p> | R: DOE<br>P: MPG, DIMT, URCP, LC, AGDG, MSC |
| Development of industrial estates around the wetland | <p><b>5 years:</b></p> <p>Preventing possible intrusion of industries and reducing their effects on the wetland</p>   | <p>2.1. Proposing a plan to determine the wetland 's privacy in order to be approved on Department of Environment</p>   | R: DOE<br>MRWA<br>P: DNRW                   |
|  | <p><b>25 years:</b></p> <p>Reducing the impact of human and industrial activities in the privacy and bed of Meighan Wetland</p>   | <p>2.2. Regular monitoring by Department of Environment on establishment and activities of industries in industrial estates</p> <p>2.3. Prevention of issuing licenses for land use change and establishment of industries in the wetland 's privacy</p> <p>2.4. Studying effects of industries are building and the present industries on the wetland</p> <p>2.5. Preparing environmental management plan and doing necessary reforms</p>  | R: DOE, DIMT<br>P: AJO, DNRW, IEC           |

**Objective 6: Raising awareness, informing and participation of involved persons**

| Priority issues         | Targets  | Priority actions   | Responsible agent (R)<br>Partner agent (P)  |
|-------------------------|--|--|---|
| Informing and educating | <p><b>5 years:</b><br/>Increasing public awareness about wetland values and functions as much as 50%</p> <p><b>25 years:</b><br/>Increasing public awareness about wetland values and functions as much as 100%</p>  | <p>1.1. Proposing and implementing of an integrated plan for education and informing</p> <p>1.2. Installing signpost and introducing the wetland in the region</p> <p>1.3. Preparing brochures and maps of the wetland and distributing them</p> <p>1.4. Preparation of TV/Radio programs on the wetlands' values</p> <p>1.5. Culture-building about conservation of the wetland through providing field training and textbooks to the students</p> <p>1.6. Establishing environmental and wetland schools in the province</p> <p>1.7. Raising the local communities' awareness level on values and functions of the wetland</p> | <p>R: DOE</p> <p>P: AJO, DNRW, MRWA, ETO, MPCHTO, URCP, LC, NGOs, BMM</p>                               |
| Participation           | <p><b>5 years:</b><br/>Increasing the level of participation of involved persons in the conservation and management of the wetland at a rate of 50%</p> <p><b>25 years:</b><br/>Full participation of involved persons in the conservation and management of the wetland</p> | <p>2.1. Proposing participation pattern through definition and implementation of at least two participatory plan in selected pilots</p> <p>2.2. Introducing participatory concepts and approaches by visiting successful pilots and holding training courses</p> <p>2.3. Identification and use of existing capacities for implementation of participatory projects</p> <p>2.4. Capacity building by NGOs to increase their participation in conservation and management of the wetland</p>  | <p>R: DOE</p> <p>P: AJO, DNRW, MRWA, MPWWC, MPG, MPCHTO, DRUD, DIMT, MPFM, ETO, URCP, NGOs, LC, BMM</p> |

**Objective 6 (cont'd): Raising awareness, informing and participation of involved persons**

| Priority issues | Targets   | Priority actions  | Responsible agent (R)<br>Partner agent (P)                          |
|-----------------|---|---|---|
| Research        | <p align="center"><b>5 years:</b><br/>Creating electronic database of the wetland</p> <p align="center"><b>25 years:</b><br/>Maintaining and updating the database of the wetland</p> | <p>3.1. Collecting all researches and studies conducted on the wetland</p> <p>3.2. Integrating, updating and making available the relevant research on the wetland</p> <p>3.3. Design and operation of the wetland's database</p> <p>3.4. Creating an electronic database of concluded and ongoing studies</p> <p>3.5. Continuity and orientation to the wetland's studies based on Integrated Management Plan and the research priorities</p> <p>3.6. Monitoring the wetland ecosystem based on approved protocols and recording date in the database</p> <p>3.7. Proposing functional research priorities on the wetland and submitting it to academic institutions</p> <p>3.8. Holding bi-annual conference of Meighan Wetland</p> | <p>R: DOE</p> <p>P: AJO, DNRW, URCP, MPG, MRWA, MPWWC, NGOs, LC</p> |

## 5. Governance and implementation mechanisms

### Executive structure and job description of the provincial committee of Integrated Management Plan for Meighan Wetland

| Members and structure   | Job description  | Descriptions   |
|---|--|--|
| <ul style="list-style-type: none"> <li>- Governor (Chairman of the committee)</li> <li>- Coordination deputy of the governorships' staff affairs</li> <li>- General Director of the province's Department of Environment (secretary of the committee)</li> <li>- Governor of the Arak city</li> <li>- Head of the province's Management and Planning Organization</li> <li>- Head of the province's Agricultural Jihad Organization</li> <li>- General director of the province's Natural Resources and Watershed</li> <li>- CEO of the province's Regional Water Authority</li> <li>- General Director of the province's Cultural Heritage, Handicrafts &amp; Tourism</li> <li>- CEO of the province's Water &amp; Wastewater Co.</li> <li>- General Director of the province's Roads &amp; Urban Development</li> <li>- General director of the province's Industry, Mine &amp; Trade</li> <li>- CEO of the province's Rural Water &amp; Wastewater Co.</li> <li>- 2 faculty members of the provinces' universities &amp; research centers</li> <li>- 1 representative of the Islamic Council of Arak metropolis</li> <li>- 2 representatives of the local communities</li> <li>- 1 representative of Environmental and Natural Resources Network</li> </ul> <p><b>In addition, the following members invite to meetings according to the necessity:</b></p> <ul style="list-style-type: none"> <li>- General director of the province's Meteorological Organization</li> <li>- Manager of the province's Fisheries</li> <li>- General director of the province's Housing Foundation</li> <li>- CEO of the province's Oil Pipeline and Telecommunication Company</li> <li>- General director of the province's Veterinary Service</li> <li>- General director of the province's Education &amp; Training Organization</li> <li>- Rector of Arak University of Medical Sciences</li> <li>- CEO of the province's Industrial Estates Corporation</li> <li>- Head of the province's Agricultural &amp; Natural Resources Engineering Organization</li> <li>- CEO of the Mineral Salts Co.</li> <li>- Mayor of Arak metropolis</li> </ul> | <ol style="list-style-type: none"> <li>1. Supervision on implementation programs of the wetland integrated management, and evaluation and monitoring them</li> <li>2. Reviewing and updating the management plan on an annual basis</li> <li>3. Preparing annual executive and operating program and aligning state agencies' executive plans in the range of the wetland</li> <li>4. Preparing annual executive report of the integrated management plan</li> <li>5. Facilitating cross-sectoral coordination and resolving possible conflicts</li> <li>6. Planning and coordinating to allocate and attract necessary budget from provincial and national sources</li> </ol> | <p><b>Permanent secretariat of Integrated Management Plan for Meighan Wetland that is based on Markazi Province Department of Environment is responsible for keeping track of the following:</b></p> <ol style="list-style-type: none"> <li>1. Preparing and following up annual work programs on the relevant authorities</li> <li>2. Coordinating in order to finance needed in various sectors</li> <li>3. Multi-sectoral coordinating to integrate the plan activities</li> <li>4. Submitting work progress reports</li> <li>5. Establishment of a monitoring system for the wetland management, and submitting monitoring and assessing report to various levels of management</li> <li>6. Annual evaluation of implementation of the integrated management plan for the wetland</li> <li>7. Facilitating communication among beneficiaries, particularly local communities</li> <li>8. Documenting information of the integrated management plan for the wetland and publishing the plans' news and announcements (administrative informing, newsletter, brochure, website, etc.)</li> </ol> |

### Executive structure and job description of Meighan Wetland 's association of the local communities

| Members and structure   | job description   |
|---|---|
| <p><b>The association has 11 members as follows:</b></p> <ul style="list-style-type: none"> <li>- 1 representative of the City Council of Davudabad</li> <li>- 1 representative of the Municipality of Davudabad</li> <li>- 8 representatives of villages around the wetland (Vismeh, Dehnamak, Sahlabad, Mobarakabad, Taramazd, Rahzan, Moradabad and Meighan)</li> <li>- 1 representative of the Mineral Salts Co.</li> </ul> | <ol style="list-style-type: none"> <li>1. Selecting and introducing two representatives of local communities to participate in provincial committee of Integrated Management Plan for Meighan Wetland</li> <li>2. Holding regular meetings periodically</li> <li>3. Preparing and filing of meeting minutes</li> <li>4. Consulting and discussing on the wetland</li> <li>5. Communication with state agencies</li> <li>6. Cooperation in attracting participation of local people in implementation of management programs of the wetland</li> </ol> |

### Appendix 1. Meighan Wetland monitoring plan

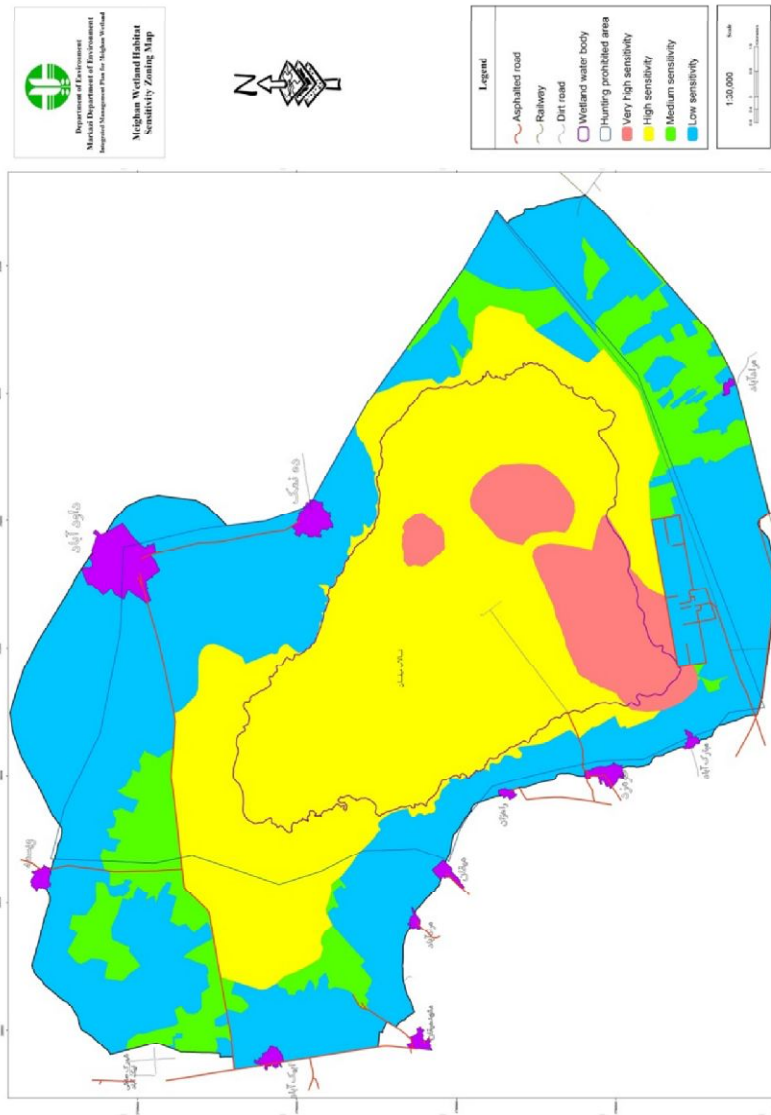
Meighan Wetland integrated monitoring plan was proposed in order to regularly review the status of the wetland, to ensure its proper operation, to control changes in the wetland's environmental indicators over the time, and to ensure effectiveness of implementation of Integrated Management Plan for the Wetland; it was proposed in participatory structure and through expert meetings of the water and soil, biodiversity, and socio-economic expert groups of Meighan Wetland. The following table represents a summary of Meighan Wetland monitoring plan including monitored features and parameters, and responsible institution for each of them. The results of any monitoring, in addition to showing the status of the wetland environment will provide necessary information to any possible review and complete the management plan.

## Meighan Wetland monitoring plan

| Monitored features     |   | Responsible agent for monitoring (R)<br>Partner agent for monitoring (P) |                          |
|------------------------|---|--|--------------------------|
| Biodiversity           | Index migratory waterfowls and shorebirds of the wetland (Common Cane, ...)   | R: DOE   |                          |
|                        | Breeding waterfowls and shorebirds in the range of the wetland (Armenian Gull, ...)   | R: DOE   |                          |
|                        | Mammals in the range of the wetland with an emphasis on Marbled Polecat species   | R: DOE   |                          |
|                        | Reptiles in the range of the wetland with an emphasis on Persian Toad-Headed Agama  | R: DOE   |                          |
|                        | Artemia   | R: MPFM  |                          |
|                        | Index plant species in the range of the wetland with an emphasis on <i>Nitraria schoberi</i> , <i>Halocnemum strobilaceum</i> , <i>Atriplex verrucifera</i> | R: DOE, DNRW<br>P: URCP  |                          |
|                        | carbon sequestration  | R: DOE, DNRW<br>P: URCP  |                          |
| Water and soil sources | Water quantity  | Wetland  | R: DOE, MRWA             |
|                        |   | Underground waters   | R: MRWA                  |
|                        |   | Output from wastewater treatment plant to the wetland                    | R: DOE, MRWA             |
|                        |   | Waterways  | R: MRWA                  |
|                        | Water quality   | Wetland (wetland area, permanent ponds in the minerals extraction site)  | R: MRWA<br>P: DOE        |
|                        |   | Underground waters   | R: MRWA                  |
|                        |   | Output of wastewater treatment plant                                     | R: MRWA, MPWWC<br>P: DOE |
|                        | Soil pollution  | R: DOE<br>P: MRWA, MPWWC, URCP   |                          |
|                        | Soil erosion  | R: DOE, DNRW<br>P: MRWA, URCP  |                          |
|                        | Agriculture   | R: AJO<br>P: MRWA, LC  |                          |
|                        | Land use of the wetland area  | R: AJO<br>P: DNRW, DOE, LC   |                          |
| Socio-economic status  | Sustainable tourism   | R: MPCHTO  |                          |
|                        | Migration   | R: MPG   |                          |
|                        | Participation of local communities  | R: DOE<br>P: LC  |                          |
|                        | Environmental awareness level   | R: DOE<br>P: NGOs  |                          |
|                        | Sustainable livelihood  | R: MPG<br>P: LC, MPCO  |                          |

## Appendix 2. Meighan Wetland zoning

Zoning map of Meighan Wetland range and list of permitted and non-permitted activities in each zone are presented in next Figure and Table.



Zoning map of sensitivity of the habitats in Meighan Wetland range

**Outline of the permitted and non-permitted activities in the different levels of sensitivity of Meighan Wetland range**

| <b>Amount of sensitivity</b> | <b>Permitted activities</b>  | <b>Non-permitted activities</b> | <b>Responsible agent and Partner agent to determine administrative regulations</b>  |
|------------------------------|--|---------------------------------|---|
| Very high sensitivity        | Investigations, researches and studies (with permission)<br>Conservation (according to guidelines)   | Other activities                | DOE   |
| High sensitivity             | Investigations, researches and studies (with permission)<br>Decentralized ecotourism (with permission)<br>Conservation, rehabilitation and reconstruction (according to guidelines)  | Other activities                | DOE<br>In partnership with:<br>DNRW, Academic and research institutions   |
| Medium sensitivity           | Investigations, researches and studies (with permission)<br>Conservation, rehabilitation and reconstruction (according to guidelines)<br>Decentralized ecotourism (with permission)  | Other activities                | DOE<br>In partnership with:<br>DNRW, Academic and research institutions<br>Cultural Heritage, Handicrafts & Tourism Organization      |
| Low sensitivity              | Investigations, researches and studies (with permission)<br>Conservation, rehabilitation and reconstruction (according to guidelines)<br>Decentralized ecotourism (with permission)<br>Sustainable agriculture (with permission)<br>Sustainable animal husbandry (with permission)<br>Sustainable livelihood (with permission) | Other activities                | DOE<br>In partnership with:<br>DNRW, Academic and research institutions<br>Cultural Heritage, Handicrafts & Tourism Organization, AJO |





Conservation of Iranian Wetlands Project

Saving Wetlands, for People, for Nature



Markazi Department of Environment

## Integrated Management Plan for Meighan Wetland

Prepared In Cooperation with  
Governmental Organizations, NGOs  
and Local Communities of Meighan Wetland

