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Artificial Wetlands in Khuzistan, Iran; Problems and Solutions

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Introduction

Drainage water of agricultural and fish farms in Khuzistan Province flows into the artificial wetlands.



Due to quality problems, the drainage water cannot be discharged into the nearby Karun River.



The area of the wetlands and its water salinity is increasing.

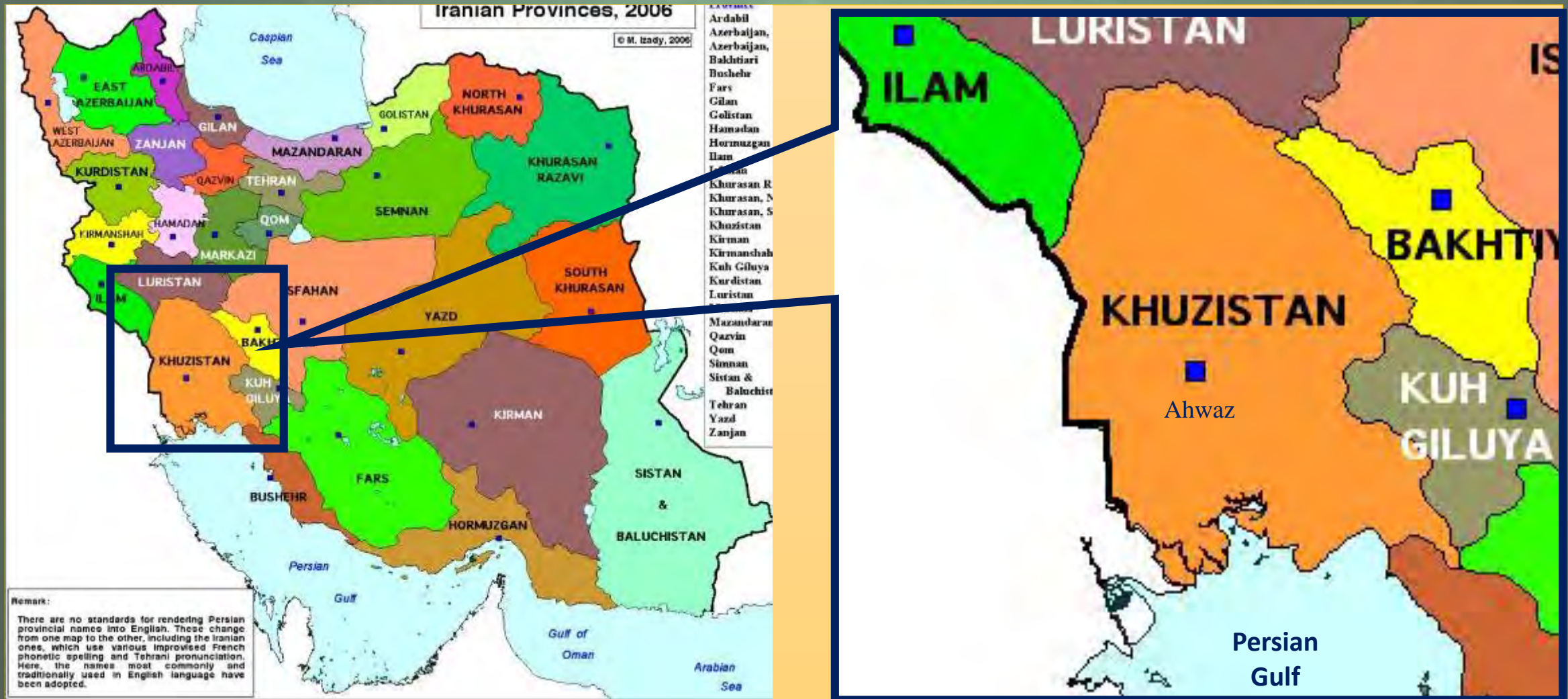


To keep water salinity in an acceptable level, an outlet is needed to be implemented



Hence, the environmental threats of the wetlands could be altered to opportunity.

Location of Khuzistan Province in South West of Iran





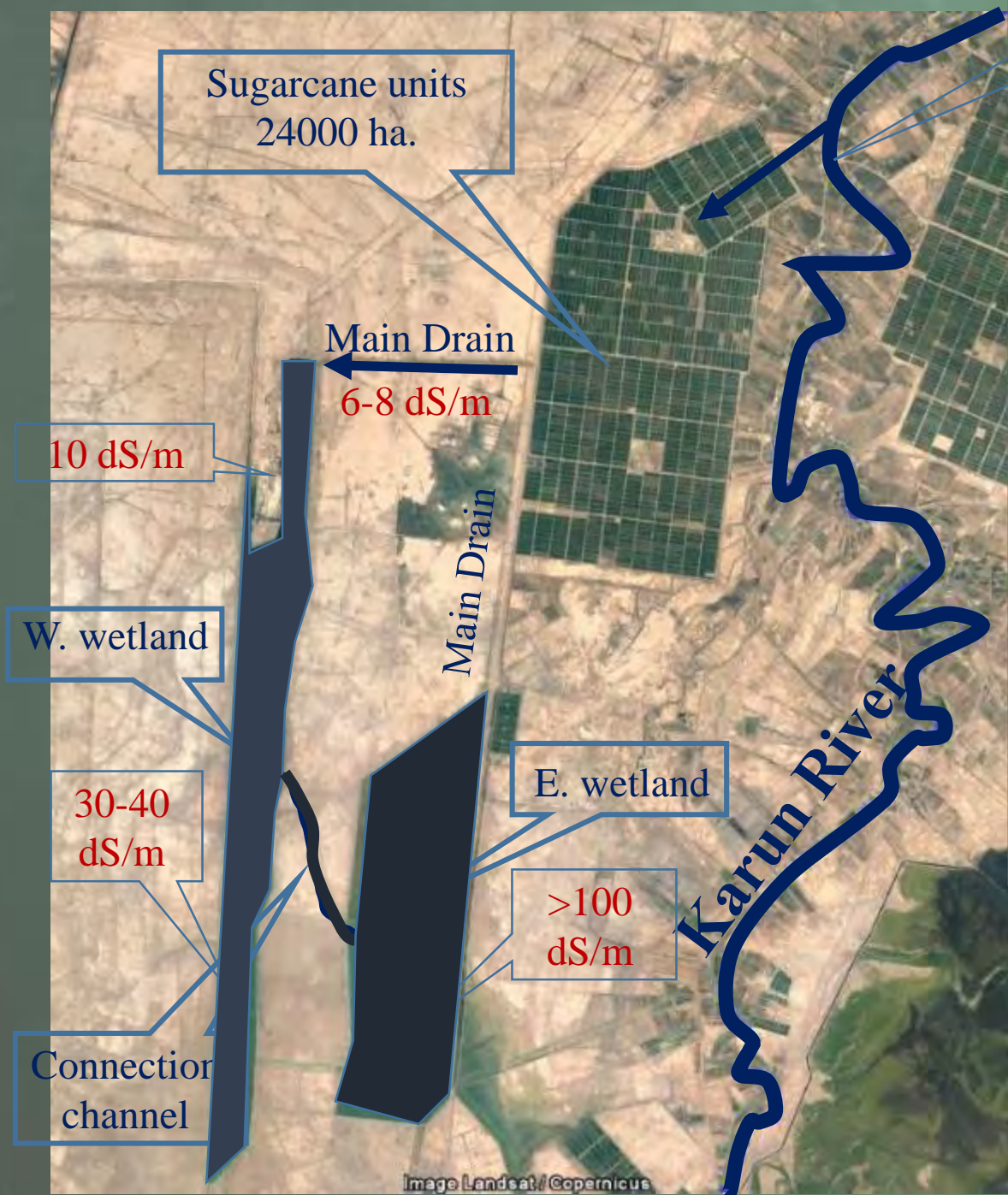
Karun River Basin

Khuzistan Province

Karun River

**Agro-industrial units and fish farms
30000 ha.**

**Artificial Wetlands
Annual Drainage water
336 MCM**



Karun, 2.5- 3 ds/m

Irrigation water use: 720 MCM/year
Drainage water: 324 MCM/year
Area of E. Wetland: 11000 ha.
Area of W. Wetland: 23000 ha. (Expanding)

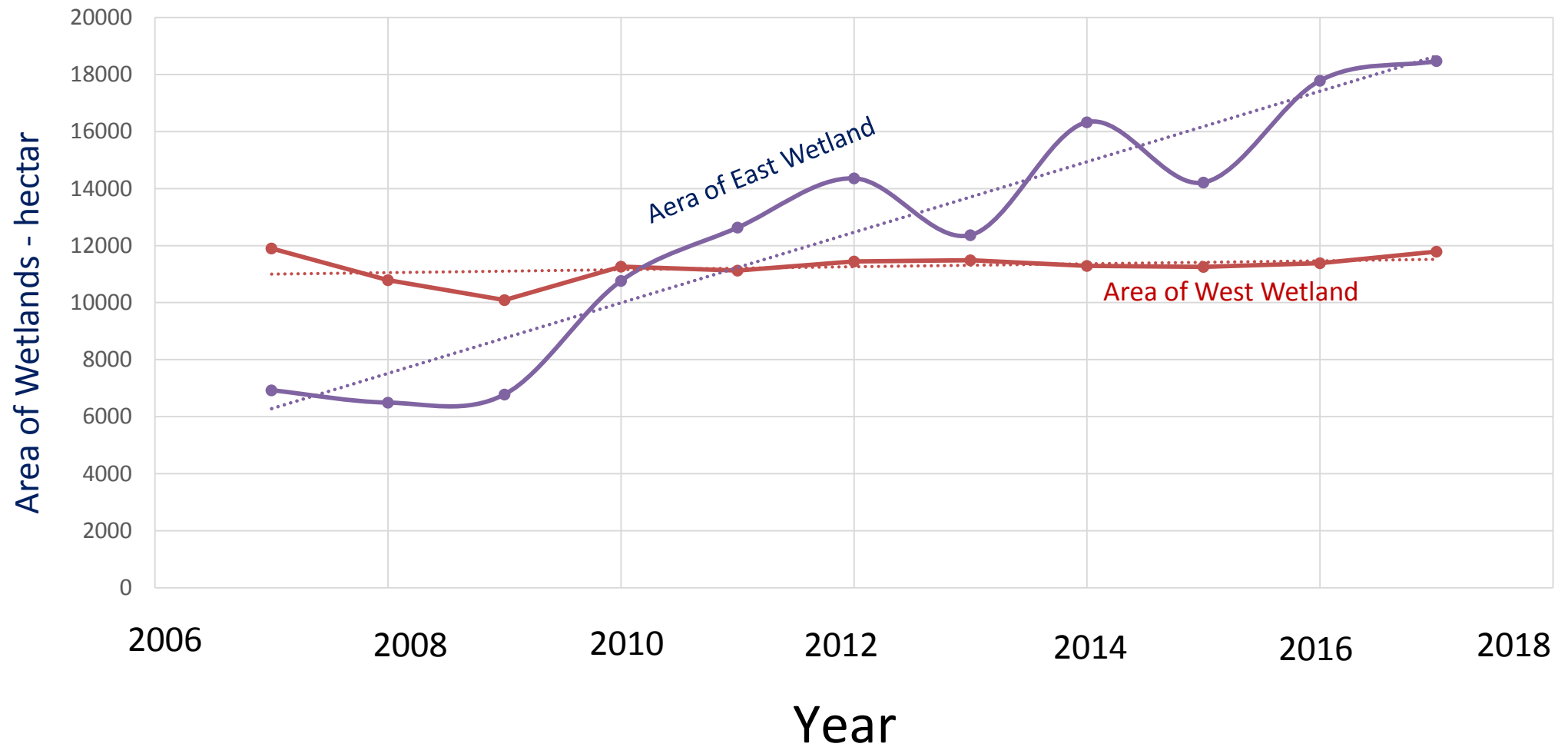
Drainage Water Pump Station of Sugarcane Units - 20 m³/s

Mean Annual Inflow and Outflow of wetlands

Inflow (MCM/year)		Outflow (MCM/year)	
Sugar Cane units	336	Evaporation	465
Fisheries	165		
Khorramshar Unit	38		
Rainfall	53		
Total	592	465	

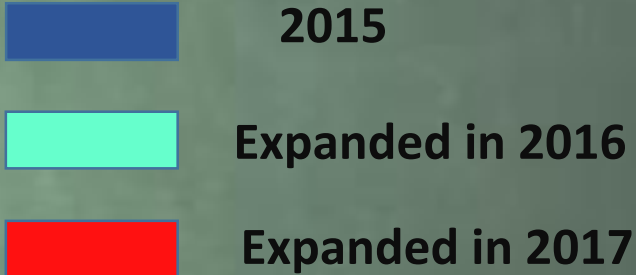
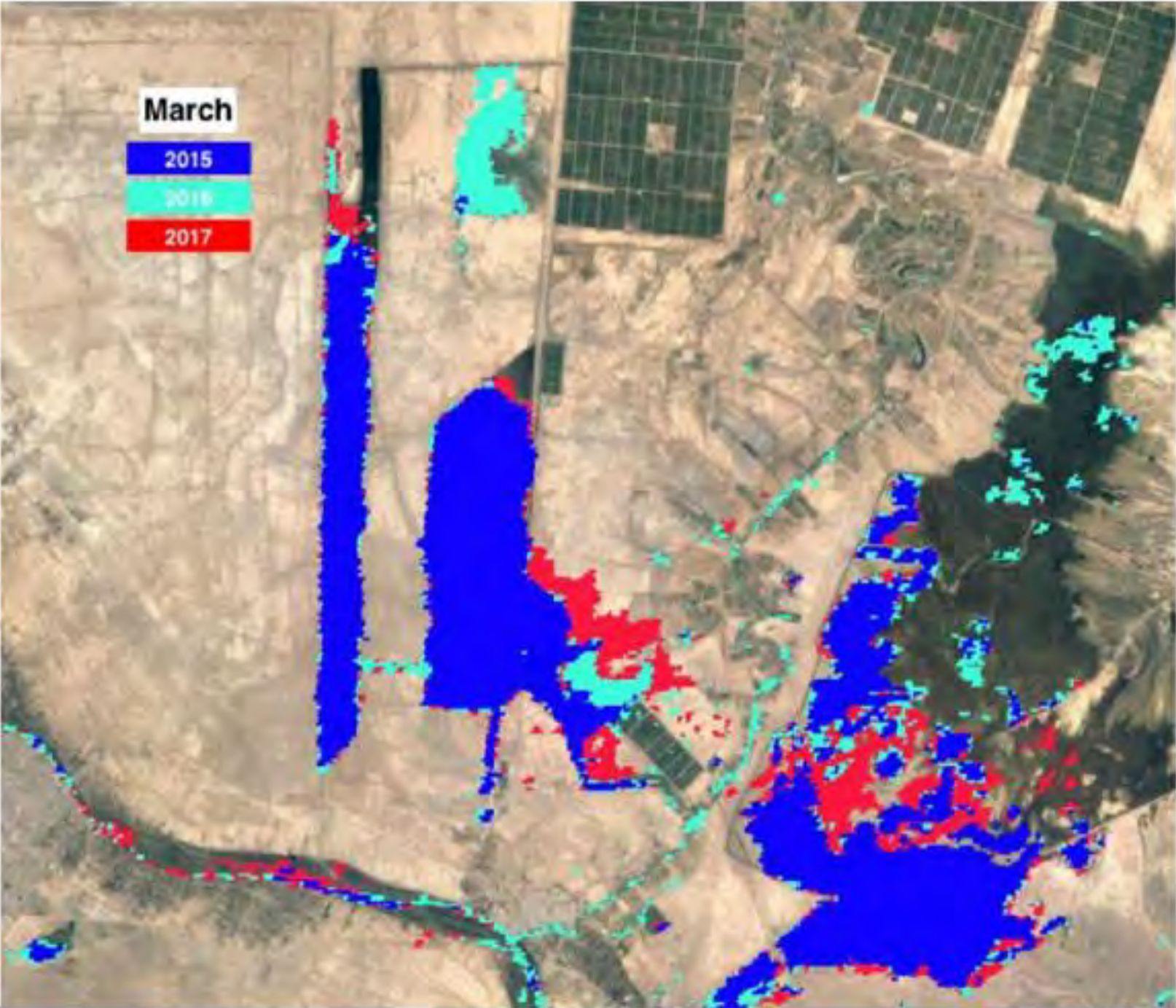
$$592 > 465$$

Hence, the area of the wetlands is increasing.



Expansion of the wetland area in recent years

Expansion of the wetlands during last 3 years





Consequences

1 **The wetlands are still expanding.**

2 **Water quality is deteriorating.**

3 **Water will be lost for reuse.**

Recommendations

Recommendations could be categorized in 2 scales:

- ✓ On-Farm scale
- ✓ Wetlands scale

Recommendations: On-Farm scale



Salt tolerant sugar beet with high yield



Cotton irrigated with water EC= 6-8 dS/m



Kanaf irrigated with water EC= 6-8 dS/m

➤ **Modification of cropping pattern i.e. :**

- **sugar beets instead of sugarcane (12000 m³/ha. vs 30000 m³/ha)**
- **salt tolerant rice,**
- **salt tolerant cotton,**
- **jute (knaf), etc.**

➤ **Using controlled drainage to reduce drainage water volume and to improve water quality.**

Recommendations: wetland scale



Seabass
fish



Vannamei
Shrimp



Algae



Artemia

➤ Using saline water for aquaculture

- Fish
- Shrimp
- Algae
- Artemia



➤ Using saline water for Biosaline agriculture

- quinoa
- Salicornia
- Atriplex

Recommendations: wetland scale (cont.)

- **Changing approaches to the wetlands**
 - Wetland is now an opportunity rather than a threat
 - Study on the optimum size of the wetland
 - Construction of an outlet.
 - Using wetland water for different uses based on its salinity.

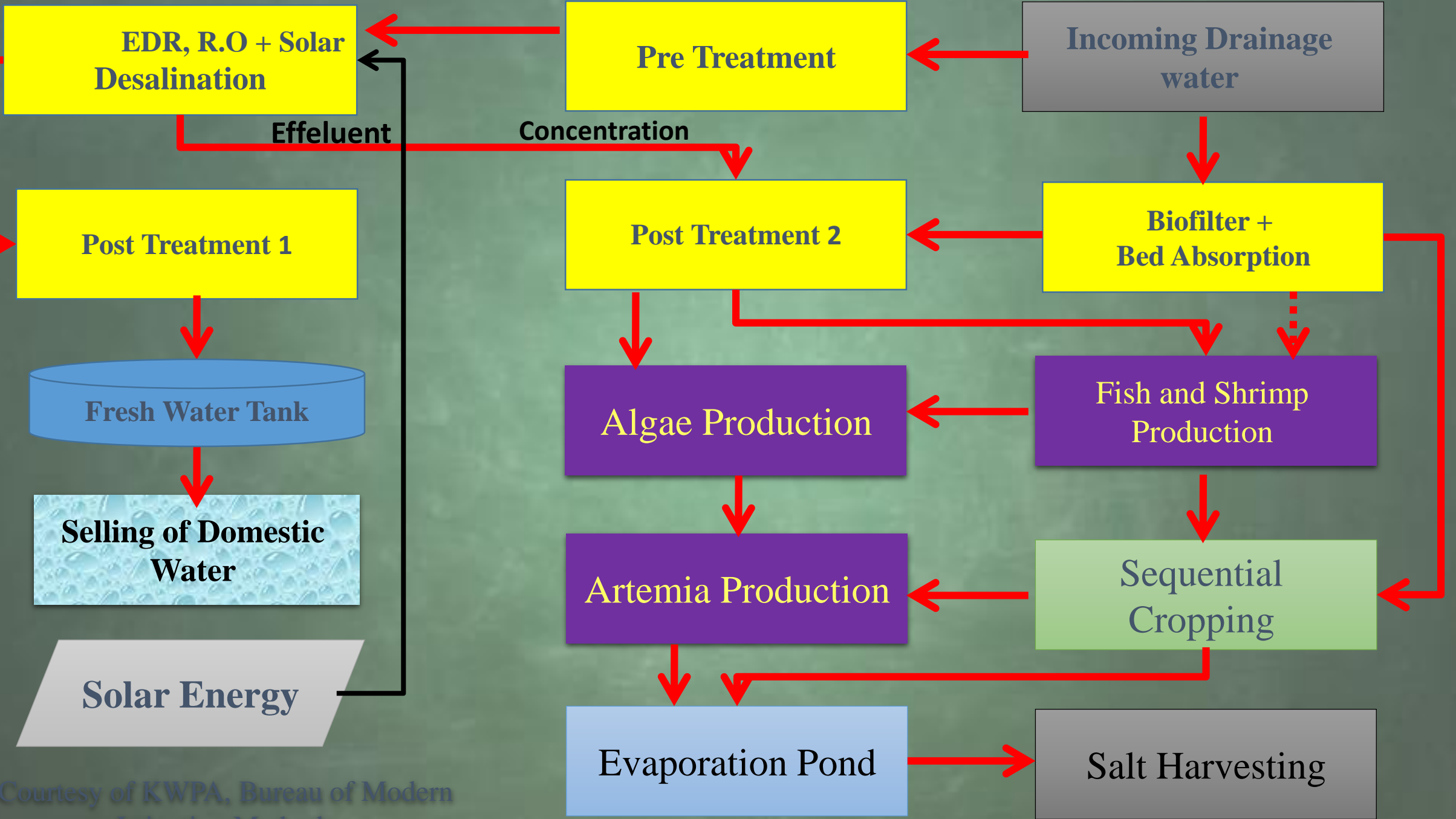
The size of the wetland depends on the outflow

Optimum size of the wetland

Discharge from							
(m ³ /s)							
Area of Wetland (ha.)	Min.	29,456	27,341	22,763	15,673	7,936	1,119
	Mean	37,268	35,802	29,213	21,457	13,671	7,334
	Max.	45,667	43,980	36,426	31,562	31,484	31,484

The desired size of the wetland is based on the decisions of the beneficiaries especially Department of Environment

HALOCUCHER FLOW DIGRAM



Courtesy of KWPA, Bureau of Modern Irrigation Methods

Thank you

