

Ecological Importance of Wetlands and Samples in Konya Closed Basin

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ABSTRACT

Wetlands are noteworthy areas as breeding-ground for biota, threatened by drought and human intervention in Turkey as well as a large part of the world. The wetlands of Konya Closed Basin (KCB) with the diversity of its fauna and flora, is irreplaceable for nature conservation in Turkey and globally. Although KCB has the least amount of rainfall in Turkey, it has very important wetlands. In KCB, there are 16 important bird areas and 6 major plant sites. Moreover, KCB has breeding grounds for eight of out of thirteen bird species which are in danger of extinction all over the world. In recent years, ongoing drought conditions, increasing agricultural demands, and urban and industry water needs have led a significant reduction in the level of groundwater. Huge nonrenewable ground water abstraction for irrigation has caused to decline approximately 1-3 m in a year. This situation has created a negative impact on wetlands. The aim of this paper was to draw attention to importance of wetlands. In the study, the potential of water resources, characteristics and problems of the wetlands, challenges and solutions to protect wetlands were evaluated and discussed. The data were obtained from scientific publications, public and private organizations.

In the KCB, while there were 45,000 wells and 1.760.456 hectares area under cultivation in 2002, there were in 2011 over 100,000 wells and 2.023.513 hectares area under cultivation. Some of the wetlands, such as, Hotamış marshes and Eşmekaya marshes got completely dry. In addition, Ereğli marshes, Tuz Lake, Beyşehir Lake, Meke maar (Lake) and Samsam Lake decreased by 30-85%. The loss of biodiversity in the wetlands of KCB has reached a fearful rate.

It has been confirmed in the KCB that water consumption above feeding capacity of the basin is not sustainable. Using in accordance with feeding capacity of the groundwater, using water-saving methods on irrigation and developing awareness on water-saving in society can contribute to the solution of the problem.

Keywords: Wetlands in Konya, Sustainability, Climate Change, Groundwater.

I. INTRODUCTION

Wetland; natural or man-made, permament or temporary, continuous or seasonal, ditch or running, fresh, brackish or salt water, at a maximum of 6m during low tide, mattering as habitats to especially aquatic birds and other life, all waters, swamps, marshes and peat moor and all areas ecologically swept by water from their coastline inwards (Çagırankaya and Meriç, 2013). Wetlands accommodate % 40of all species and 12% of all animal species in the world. The two main route of four bird migration route passes through Turkey in the West Palearctic region. These are North-south migration routes (Bosphorus migration route) and North-South migration (Çoruh) route (WWF-Türkey.2010).

Konya Closed Basin (KCB) is important for nature conservation in Turkey and globally, particularly for its wetlands, the extensive areas of remaining salt steppe and the diversity of its fauna and flora (Schipper and Schot 2004). Under the Ramsar Convention, 13 sites in Turkey have been announced as Ramsar Sites: Sultan Marshes in Kayseri, Kuş Lake in Balıkesir, Seyfe Lake in Kırşehir, Göksu Delta in Mersin, Burdur Lake in Isparta in 1994; Kızılırmak Delta in Samsun, Uluabat Lake in Bursa, Gediz Delta in İzmir, Akyatan Lagoon in Adana in 1998; Yumurtalık Lagoons in Adana, Meke Maar in Konya in 2005; Kızören Obruk in Konya in

2006; Kuyucuk Lake in Kars in 2009 (Çagırankaya, and Meric, 2013). But, an important part of the wetland in the KCB has also dried up or shrunk the rate of 30-85%. Similarly, USA have lost 54% of wetlands (87 miles hectares) and England 40% of coastal wetlands since 1960. 80% of the marshes were dried in Landes region in the south west of France. It is estimated that about 90% of new Zealand natural wetlands be destroyed (Cirik, 1993). Magnin and Yarar (1997) Report that, decreases in lake extent for Suğla Lake, Hotamış Lake and Samsam Lake from their original size to the situation in the 1990s. The wetlands have been affected negatively by high evapotranspiration in the region. In July, average precipitation shortages are up to 160 mm, and potential evapotranspiration ranges from a minimum of 0 mm for built-up areas up to a maximum of 170 mm for Tuz Lake and the cultivated areas in the centre of Konya Closed Basin (Schipper and Schot, 2004). Estimated Average yearly Evapotranspiration (2005-2009) in KCB is 709,6 mm. The irrigation water use for 2005-2009, within the water -limited Konya Plain ranged up to 500 mm year⁻¹ with a mean -308 mm year⁻¹. In the case of croplands, the mean P-ET deficits are -308mm year⁻¹ and -230 mm year⁻¹ for irrigated and non irrigated croplands respectively (Gökmen. 2013). According to (Arslan and Göçmez, 2004), precipitation is more than evaporation + transpiration (ET) from January until the end of March in the region. Water needs are met by the useful water reserves in April and May, there reveals water deficient from June until the end of October. The soil water reserve is completed again in November and December. De Martonne (1942) index is calculated as 8,882. Accordingly, The KCB region is represented as semiarid climate zone. It is closer to the transition zone between the humid with semi-arid area.

Although, KCB has the least amount of rainfall in Central Anatolia (Turkey), it has 1.9 million hectares of arable land, and 1.6 million hectares of it is suitable for irrigation. The Taurus Montains located in the south and southwest of KCB are the main water source areas, where high rainfall and snowmelt feed the ephemeral rivers and recharge the aquifer. Taurus Montains has well developed karst geology. In 2011, according to calculations made in cropping pattern in irrigated areas; while, yearly of irrigation water requirement is estimated that 4.319 billion m³year⁻¹, the actual water use is estimated 6.628 billion m³year⁻¹ (Şahin et al. 2013). To be irrigated all of the available agricultural land (compared to the average of 500 mm of irrigation water) are needed about 15 billion m³ net irrigation water (Topak et al. 2008). KCB agriculture is largely dependent upon irrigation. Increased production demands are rapidly depleting available surface and ground water sources. In 2011, approximately 2.023.513 hectares of KCB were under cultivation. As of 2002, there were 1.760.456 hectares under cultivation. In 2002, there were approximately 45,000 wells in the KCB. There are now over 100,000 (FAO, 2014). On the other hand, improvement of agricultural water use efficiency is an important factor in the struggle against drought. Yield increase and water saving with drip irrigation methods compared to other conventional irrigation methods are 72 % and 47% on potatoes, 25% and 33% on onions respectively (Dua 1995). According to Magar (1995), it is %4,8 and %30 on tomatoes, %8,8 and %59,6 on pumpkin respectively. In addition, water consumption is likely to be seriously affected by crop pattern. 1.43 (decare) da of vegetables and sugarbeet, 1,52 da maize, 1,82 da sunflower, 1,96 da potato, 2,08 da beans, 4,08 da wheat and 5,00 da barley can be irrigated with water that is used for 1 da alfalfa in KCB condition (Kara et al. 2008). The ratio of sugar beet cultivation in the Konya plain is 21.66%, net irrigation water requirement, is 32.2% of the Konya plain needs. Total water use of maize Konya basin is at the level of 6.2% in 2000 (Topak et al. 2008). In 2011, according to calculations made in cropping pattern in irrigated areas; while, yearly of irrigation water needs was estimated 4.319 billion m³year⁻¹, the actual water use was estimated 6.628 billion m³year⁻¹. For irrigating all of the available agricultural land (compared to the average of 500 mm of irrigation water) approximately 15 billion m³ net irrigation water are needed (Topak et al. 2008).

Over the last few decades, the basin experienced huge non renewable groundwater (GW) abstraction for irrigation, which caused approximately a had decline of 1 m year⁻¹ (Bayarı et al. 2009), 3 meters annually (FAO, 2014). Declining in the groundwater level leads to the drying out of wetlands. The result is increased desertification, wind erosion and salinization. The pace and rate of loss of biodiversity especially in wetlands is daunting (FAO, 2014). According to (İşçioğlu 2008), due to the hydrological cycle is linked in itself, the changes on far away from wetlands affect the wetlands negatively. Problems have developed depending on falling water levels because of groundwater abstraction over the feeding for irrigation. In the paper, importance of the wetlands are analysed in the KCB. In addition, the last status of wetlands are mentioned and focused on the proposals.

II. METHODS AND MATERIAL

The KCB area is located in the south of Ankara in the heart of Turkey (fig. 1). The area consists of two closed sub-basins that will further be referred to as Tuz Basin and Konya Basin (Schipper and Schot, 2004). Each of them is characterized by the presence of a large lake, respectively Tuz Lake and Beysehir Lake (Camur and Mutlu, 1995). The high mountains in the south of KCB belong to the Toros range, made up of Devonian, Permo-Carboniferous limestones, schists and Cretaceous limestones (Meester 1971). The area is surrounded by mountains, reaching a height of up to 3200 m in the south. The central parts of the area are characterized by the presence of plains at an elevation of 900 - 1000 m. (Schipper and Schot, 2004). The area covers an area 65.322 km², and is located in the Aksaray, Ankara, Antalya, Isparta, İçel, Karaman, Konya, Nevşehir, Niğde provinces consist of 8.3% of Turkey's land area, and 12.14% of the agricultural area (2.889.500 ha).

Table 1The provinces in Konya Closed Basin(TUBİTAK-MAM, 2010)

Province	Total	Basin	The ratio	Distributio
s	area (ha)	area in	of	n of the
		the	provincia	basin
		province	1	by
		(ha)	area İn	province
			the basin	(%)
			(%)	
Aksaray	799.700	682.879	85%	14%
Ankara	3.071.50	213.963	7%	4%
	0			
Antalya	2.072.30	33.690	2%	1%
	0			
Isparta	893.300	123.978	14%	2%
İçel	1.585.30	35.405	2%	1%
	0			
Konya	3.825.70	2.810.98	73%	56%

	0	8		
Karaman	959.000	572.668	60%	12%
Nevşehir	546.700	64.619	12%	1%
Niğde	1.429.40	440.467	31%	9%
	0			

The area is characterized by a semi-arid continental climate: summers are hot and dry, winters are cold and moist (Meester 1971). Precipitation ranges between 280 and 640 mm year⁻¹ and is considerably lower in the centre of the KCB. Highest values are found in the mountainous parts in the west and the south. Tuz Basin is characterized by an average amount of 8,44791. 10^6 mm precipitation per year and Konya Basin by 1,52647. 10^7 mm (New et al. 1998).

Originally, agriculture was based on rain-dependent crops and semi-nomadic sheep husbandry. Today, irrigation is leading to the development of other crops (sugar beets, lentils), decreasing cereals (Fontunge et al. 1999) and livestock farming (especially dairy farming). Average gross precipitation is top in January and bottom in July. Distinct differences between winter and summer precipitation are present, with a maximum of 120 mm in January whereas maximum precipitation in July does not exceed 13 mm.



Figure 1. Position of Konya Closed Basin.

Irrigated land is 923.569 ha (32% of total agricultural land) and dry farming areas are 1.965.931 ha (68% of total agricultural land). The Taurus Mountains are the main water source of KCB with high rainfall and snow feed the ephemeral rivers and recharge the aquifer. There are 16 important bird areas and 6 major plant sites KCB. Important bird areas are Bolluk Lake, Tersakan Lake, Tuz Lake, Obruk Plateau, Ereğli Plain, Kulu Lake, Kozanlı Gökgöl, Akyay Plain, Karapınar

Plain, Beyşehir Lake, Hodulbaba Mountain, Samsam Lake, Hotamış Marshes, Eşmekaya Marshes, Sarayönü, Suğla Lake. Major plant sites are Ereğli Plain, Tuz Lake and Steppe, Karapınar Plain, Dedegöl Mountains, Beyşehir Lake, Akyay Lake. Inner Anatolia's specific lands with salty wetlands, seasonally flooded meadows and halophytic steppes accommodates rich fauna such as jackal, Anatolian wild sheep, grizzly bear, lynx, wolves and flora such as glaonthus, Kilikya cyclamen, and orchids.

The data of the public and other institutions, and national and international literatures were evaluated.

III. RESULT AND DISCUSSION

When evaluated the current status of wetlands in the KCB; Eregli Marshes, Akşehir Lake, Tersakan Lake and Hotamiş Marshes are completely dry. Kulu Lake, was seen again after heavy rainfall but Salt Lake, Seyfe Lake, Sultan Marshes and Eber Lake were damaged significantly. Hotamış marshes disappeared completely (WWF-Türkey.2010). Bolluk Lake, Tersakan Lake, Ereğli Marshes (Akgöl), Meke Maar, Acı Lake, Düden Lake, (Kulu Lake), Kozanlı Lake (Gök Lake), Hotamış Marshes, Kulu Lake, Samsam Lake ve Eşmekaya Marshes are Natural Sites area now. Meke Maar and Kızören Obruk are Ramsar Site.

Land classifications are as follows: 41% agricultural lands, 34% pastures / rangelands, 13% forest lands, 8% wetlands, and 4% rock and sand dunes. A great deal of the KCB is being converted from steppe and wetland to crops. In the last 10 years, more than 250.000 hectares have been put under cultivation. This is an increase of 42% (FAO. 2014). Various precipitation levels is observed compared to the district of Konya

Table 2. Precipitaton in Konya and some its county.

Period	Min. mm (year)	Max. mm (year)
Konya 1960-1970	170.1 (1967)	544.9(1968)
1971-1980	191,3(1973)	499.5(1975)
1981-1990	202,6(1989)	392,6(1987)
1991-2000	176,1(1999)	419,3(1995)
2001-2010	250,5(2005)	410,2(2009)
Seydişehir 1980-	474,9 (1984)	1202(2009)
2011		
Çumra "	176,5(1999)	391,9(2010)
Karapınar "	171,6(2004)	412,9(1985)
Yunak	315,8(1982)	694,1(1997)
"		

	January	Feb.	March	Apr.	May	June	July	Aug.	Sep	Oct.	Nov.	Dec.
The mean monthly	0.0	1.4	5.7	11.0	15.7	20.1	23.6	23.1	18.6	12.4	6.1	1.7
temperature (°C)												
The average of the highests monthly Temperature (°C)	4.8	7.1	11.9	17.5	22.3	26.7	30.2	30.1	26.1	19.9	12.9	6.6
The average of the Lowest	-3.9	-3.2	0.1	4.5	8.7	12.8	16.1	15.7	11.2	6.0	0.8	-2.3
monthly Temperatures												
Average sun Time	3.2	4.4	6.7	7.1	9.0	10.4	11.4	11.2	9.4	7.2	5.2	3.1
(hours)												
Average Number of		8.5	9.0	9.3	10.7	6.8	2.3	1.6	3.0	6.2	6.7	9.7
Rainy Days												
Average Monthly Total	35.8	27.9	28.0	32.0	43.5	24.8	6.5	5.3	11.7	30.0	31.9	41.3
Precipitation (kg/m ²)												
		Mi	n. And m	nax. Va	lue in p	period c	of 1950	- 2015				
Highest Temperature (°C)	17.6	23.8	28.9	31.5	34.4	37.2	40.6	39.6	36.1	31.6	25.2	21.8
Lowest Temperature (°C)	-25.8	-6.5	15.8	-8.6	-1.2	3.2	6.0	6.6	0.4	-7.6	-20	

Table 3. Means of climatic data the period of 1950 – 2015 by months (Anonymous, 2015)

Table 4. Evaluation in terms of drought of Konya and its county (Anonymous, 2012)

June		July		Augost		September	
2010	2011	2010	2011	2010	2011	2010	2011

CİHANBEYLİ	Semi-humid	humid	arid	arid	-	arid	arid	arid
AKŞEHİR	Semi-humid	Semi-arid	arid	arid	arid	arid	arid	arid
BEYŞEHİR	Semi-arid	arid	arid	arid	arid	arid	arid	arid
EREĞLİ	Arid	Semi-humid	arid	arid	arid	arid	arid	arid
KULU	Semi-arid	Semi-arid	arid	arid	arid	arid	arid	arid
YUNAK	Semi-humid	Humid	arid	arid	arid	arid	arid	arid
ILGIN	Humid	Semi-arid	arid	arid	arid	arid	arid	arid
SEYDİŞEHİR	Semi-humid	arid	arid	arid	arid	arid	arid	arid
ÇUMRA	Semi-humid	Semi-arid	arid	arid	arid	arid	arid	arid
KARAPINAR	Semi-humid	arid	arid	arid	arid	arid	arid	arid
HADİM	Semi-arid	Semi-arid	arid	arid	arid	arid	arid	arid
KARAMAN	Arid	Arid	arid	arid	arid	arid	arid	arid
KONYA	Arid	Semi-arid	arid	arid	arid	arid	-	arid

Table 2, 3, 4 de görüldüğü gibi yaz aylarında kayda değer yağış olmazken nisbi nem çok düşük, buharlaşma çok fazladır. Mevcut iklim koşulları sulama mevsimi boyunca maximum düzeyde sulamayı zorunlu kılmaktadır. Hâlihazır yağışlar da düzenli olmadığından bu koşullarda planlama yapmak ta güçleşmektedir. Bu nedenle, ekonomik ve teknik olarak su getirilmesi mAümkün görünen Göksu, Kızılırmak ve Seyhan Nehirlerinden havzaya su nakli planlamayı kolaylaştırabilir. koşullarda Ancak dahi bu sürdürülebilirliği sağlamak iyi bir su planlamasıyla mümkün olacaktır.

As shown in Table 2,3 and 4 relative humidity is very low, evaporation is very high while there is not significant rainfall during the summer months. Climatic conditions require watering at maximum level during irrigation season. It is empowered to make planning in conditions because of these irregular present precipitation. Therefore, water transfer from Göksu River, the Kızılırmak River and Seyhan River to the basin which looks possible to bring water economically and technically can facilitate planning. However, even in these circumstances ensuring sustainability would be possible with a good water planning.

3.1.Some of the important wetlands

3.1.1.Meke Maar

The name of "MEKE " comes from the birds in here. Meke Maar is one of the the rare geological structures in the World (Figure 2). Maar is located 8 km southeast of the center of Karapinar town and two miles northwest of the Karapinar-Eregli highway. Meke is a volcanic crater lake occured as a volcanic explosion and contains a concentric two crater lakes. The length and the width of the lake on the primary crater hole are 800 and 500 m respectively. The average lake depth is 1.2 meter, water is salty and the lake partly dries up. The volcanic cone is located in the middle of the main Maar is 50 m height from water level, and the lake is located in volcanic cone is 25 m deep and lake water is salty. There is a 25 m deep crater at the top of the main cone (Arık, 2010). The lake was used as a salt mine for so many years. The region around the lake is the breeding ground for so many birds and there is no life except the microbiological activity in the lake. The richest family the study area were Poaceae, in Asteraceae, Brassicaceae, Chenopodiaceae, Fabaceae, Lamiaceae, Caryophyllaceae, Boraginaceae, Apiaceae, Cyperaceae, Ranunculaceae and Rosaceae (Kurt et al.2013). The lake is known as the Eye of Anatolia or the evil eye beads of Anatolia is like the blue bead when viewed from above, so, is believed to bring good luck. Water of Maar is not suitable for agricultural purposes, and there is no animal husbandry and industrialization around. Meke Maar has been declared as a first degree natural sites in 1989, and declared as a natural monument in 1998. The opening of new wells is prohibited in 2003, and it has been declared as Ramsar sites in 2005. Meke Maar is completely dry in summer. Hence the birds now move away from the region.



Figure 2. Meke Maar

3.1.2.Kızören Obruk

There are more than 20 Pothole Lake in the Konya Basin. The most famous of them is the Kızören Sinkhole with 300 m wide and 145 m deep. Kızören Sinkhole has a changing color in every hour of the day. The Kızören Pothole Lake has a natural beauty worth seeing. Sinkhole water is used for irrigation by pumping.



Figure 3. Kızören obruk.

3.1.3.Akşehir Lake

Akşehir Lake is now about one-quarter of the actual size. Due to wells and streams that feed the lakes is used for agriculture and orcharding, these resources are dried up. While there were more than 200,000 waterfowl in the winter in 1969, the bird number did not exceed a few thousand in recent years. Akşehir lake-old status, 1984, 2006, 2009 and 2014 status are given in Figure 4,5,6,7 respectively.

Table 5. Effect of rainfall amount between 1984-2014 and irrigation facilities on lake surface chancing (Çatal and Dengiz, 2015).

Year	Precipit	Dam(small+	Irrigati	Earthqua	Lak
	ation	big)	on	ke	e
	mm	number	Facility		are

			number		а
					km ²
1984	490,7	0+3	2	No	365
1988	649,3	0+3	3	No	342
2000	553,8	9+3	7	36	229
2005	485,3	11+3	7	5	138
2010	530,8	16+5	7	5	125
2014	-	20+5	7	1	0

The Aksehir lake, Turkey's fifth largest lake, has disappeared due to the allocation of water sources to agriculture.



Figure 4. Images in the 1984 and 2014 years in Akşehir lake







Figure 5, 6, 7. Akşehir lake- old status, 2006 status and 2009status

3.1.4. Beysehir Lake

The part of Beysehir Lake is located in Konya province gained the National Park status in 1993. The water of Beyşehir Lake is used for irrigation of agricultural fields in the Konya Plain, and there is excessive water abstraction. Excessive water abstraction causes dune and erosion in coast. .sediment accumulation and deterioration of spawning grounds of fish. In 1978, with expulsion of Stizostedion lucioperca, in other fish species has been observed a great reduction in the lake. It also threatens the lake waste and water returning from agricultural use. Images of Beyşehir Lake are given in figure 8-12.





Figure 8, 9. Images of Beyşehir Lake









Figure 12. Common carp in Beyşehir Lake

3.1.5. Kulu Lake

Kulu lake was also damaged because of the unplanned interventions on water resources just like the other lakes in the basin. For the first time in 2006, islets on the drying lake were connected by land. Illegal hunting affects adversely bird species especially in winter and during the breeding season. Despite everything, The Kulu Lake continues to keep the water during the rainy months. Images of Kulu Lake are given in figure 13-14.





Figure 13, 14. Satellite view and an image of Kulu (düden)Lake

3.1.6. Hotamış marshes

Hotamış Marshes (Important Bird Area) largely dried with dams, discharge and irrigation canals. Hotamış Marshes will entirely disappear within the scope of of Konya Plain Project by converting wetlands the dam to be water stored by General Directorate of State Hydraulic Works. An image of Hotamış Marshes are given in figure 15.



Figure 15. Hotamış Marshes

3.1.7. Akgöl (Ereğli Marshes)

Akgöl has lost its most important water source because of waste water treatment system of Ereğli Sugar Factory for use of waste water. The Marshes that is fed by sewage of Eregli district, agricultural run-off and rainfall has almost dried up. Images of Akgöl (Ereğli Marshes) are given in figure 16, 17.



Figure 16, 17. Akgöl (Ereğli Marshes) and coastal marsh areas

3.1.8. Tuz lake

Tuz (Salt) Lake is Turkey's third largest and the shallowest lake. It is located at the intersection the Ankara, Konya and Aksaray province of the borders in the Central Anatolia. 40% of Turkey's salt needs is supplied from this lake. The Lake is 905 meters above from sea level and maximum dimensions are 80 kilometers from north to south, and 60 kilometers from east to west. The extra waters of Lake Beyşehir and wastewater of Konya are discharged to Tuz Lake with a canal. This situation causes an increase in the water level of the lake Salt Lake. The average water level of the lake is 40 cm, while in May increased rainfall is about 110 cm. The Lake is largely dry in August. The Lake Winter is an important wintering area for water birds covered by large water area in winter. Flamingos who adapt to salty environments, avocets, ruddy shelduck and other birds as well as plovers, cranes, anser anser and wild ducks live in large flocks on the lake. Tuz Lake is the most important breeding ground for flamingos in our country, each breeding ground consisting of 5-6 thousand nests located in the central part of the lake in huge incubation colonies. In September 2000, the area around the lake was declared a Special Protection Area. It is the largest Specially Protected Area of Turkey (7414 km²). Images of Tuz Lake are given in figure 18-21.





Figure 18,19, 20, 21. Satellite view and images of Tuz Lake





3.1.9. Çavuşçu Lake

Çavuşçu Lake, where there were 100 241 waterfowl in winter of 1969, is located 3 km northwest of Ilgın. Depth of Çavuşçu Lake varies between 2-10 meters. It is irrigation source of Ilgın Plain covering an area of approximately 6,000 hectares. It was transformed into a lake at the end of 1960. High water levels in the lake because of dam embankment today led to the destruction of reeds and vegetation in the lake (KOP 2013). Images of Çavuşçu Lake are given in figure 22-23.





Figure 22, 23. Images of Çavuşçu Lake.

IV. CONCLUSION

WWF-Turkey (World Wildlife Foundation) began the project" toward wise use of Konya Closed Basin " in October 2003 to ensure the protection for water resources of the basin and valuable wetland prevent further deterioration and wise use of them. WWF-Turkey defends Integrated Watershed Management Principles for the effective and sustainable management of wetlands and water resources. Therefore, Lake Beysehir which is the source of water in the basin and Salt Lake where after completing the circulation of water to reached, have been chosen as pilot areas in the project (WWF-Türkey, 2010). If agricultural water use is not be taken under control and does not provide additional water from neighboring basins, wetlands will continue to suffer. In order to resolve the problem, the following measures should be applied simultaneously. :

- 1. Prevent the growth of existing irrigated areas
- 2. The promotion of less water consuming crops by various methods such as subsidized
- 3. Making the economic water transfers from the neighboring basin
- 4. Completely converted irrigation system to drip and sprinkler irrigation
- 5. Pricing of water use above a specific amount
- 6. Supervision of irrigation time and watering duration of agricultural products, making limited irrigation in appropriate product.

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