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Water Birds of Sinnar Dam Reservoir

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Abstract

The study was conducted in near the areas of Sinnar Dam. The meadows (Mayas) of Sinnar Dam were studied during the dry season on 27/4-7/5/ 2008, /2009, 8/3-18/3/2010 and 26/2-16/3/2011. The following seven mayas were studies and they are as follow: Ras Amer, Abdelgani, Gerarisa, Bet Elwahsh Simaya, Mayat Musa, Ein elshams and Abied. The park was traversed by car along the roads between meadows ecosystem and the Dehra riverbeds and Mayas region were patrolled on foot. The place where the birds used to feed and their habitat were also considered. Observations were made in early morning (6.30-10.00) and afternoon (16.00-18.00). Each maya's visit took ten days for complete observation. The study showed that there is a wide variation in the total number of individual birds and the variation also existed in number of species (richness). It is impossible to predict the reason behind the distribution of the birds and the species richness as well except the water availability and the climate conditions.

Keywords: Wetlands; Ecosystem; Waterfowl; Ecological; Hydrological

Introduction

Wetlands is an ecosystem that depends on constant or recurrent shallow inundation or saturation at or near surface of substrate. The minimum essential characteristics of wetlands are recurrent inundation or saturation near the surface and the presence of physical chemical and biological features reflective of recurrent sustained inundation or saturation common diagnostic features of wetlands are hydric soils and hydrophytic vegetation. These features will be present except where specific physio-chemical biotic, anthropogenic factors have removed them or prevented their development.

Wetlands are defined by the Convention of Wetlands of International Importance especially as Waterfowl Habitat in article (1-1) as:

For the purpose of this Convention wetlands are areas of marsh, fen, peat land or water whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters.

For the purpose of this Convention waterfowl are birds ecologically dependent on wetlands [1].

Over 50% of wetlands in the world have been lost in the past century, and the remaining wetlands have been degraded to different degrees because of the adverse influences of human activities [2]. The loss and degradation of wetlands has negatively affected waterbirds, which depend on wetland habitats.

How to provide high quality habitats for waterbirds through effective management is a critical issue in waterbird conservation [3]. Currently, the management of wetlands focuses on artificial and restored wetlands, which by definition are greatly affected by human activities. Artificial wetlands are those that are created or extensively modified by humans, including paddy fields, salt ponds, aquacultural ponds, impoundments and reservoirs. Although artificial wetlands cannot completely replace the functions of natural ones as water bird habitats [4] researchers and managers widely recognize that artificial wetlands can provide alternative or complementary habitats for water birds in all life stages [5] and consequently, can partially mitigate the adverse influences of loss and degradation of natural wetlands (Figure 1).

Wetlands in the Sudan

Wetlands play a vital hydrological and ecological role in the Sudan. They trap and slow seasonal floods, dampening the magnitude of floods downstream and spreading out peak flows over several weeks or months. The delay and extension of flood peaks can facilitate downstream fishing and irrigation, especially in areas with an extended dry season.

Wetlands provide habitat for numerous species of animals and plants, many of them unique to these ecosystems.

Those wetlands which are near the edge of the Sahara provide vital staging grounds for migratory birds preparing to cross the desert. Wetlands also trap and hold silt carried by rivers, creating fertile alluvial soils that may be used to grow many crops and vegetables.

However, agricultural development schemes, taking advantage of the presence of both fertile soil and water, pose a threat to many wetlands.

Freshwater marshes such as the huge As Sudd in Sudan are dominated by herbaceous species such as papyrus supports a rich indigenous flora and fauna and attracts huge numbers of migratory

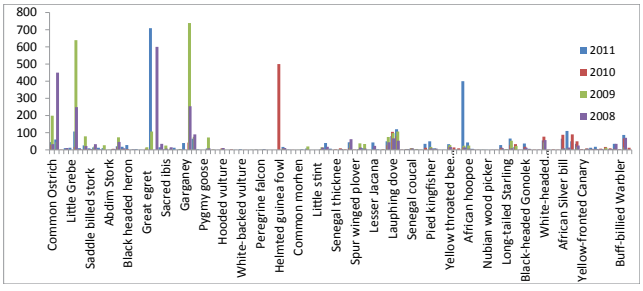

Figure 1: Hydric upland soil comparison.

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wildlife during the dry season. Like many others this vital and sensitive wetland ecosystem is threatened by the growth of ranching and tourism and by proposals to divert water for irrigation and other uses.

Wetlands cover 20% of the total area of the country and about 3% of the Nile Basin is covered by wetlands [6]. Based on the Ramsar definition and according to Moghraby there are about 13 wetlands types distinigusted in the country which include the following:-

- Large Swamps (As Sudd)
- Seasonal Streams (e.g. Gash, Barraka, Dinder & Rahad)
- Nile & its tributaries
- Mountain Streams (e.g. Khor Arba'at, River Gilo & Ingassana Hills)
- Lakes
- Man-made lake system
- Dams
- Hot springs
- Haffirs
- Mayas
- Coral reef
- Mangrove Swamps (red sea coast)
- Riparian forest

Sinnar dam was constructed in the year 1925 on the Blue Nile about 250 km south of Khartoum and 60 km north of Elsukki town. The prime objective of its construction was the irrigation of the Gazira scheme. The dam construction resulted in the formation of reservoir that extended up to Singa town about 80 km south. The length of the dam across the river is about 3 km. It has 80 lower gates and 300 upper doors. These doors are closed after the flood periods for water storage in the reservoir.

The average length of the reservoir at the flood time is about 50 km. It is constructional storage capacity is 930 million m^3 [7].

The information about wetlands in the county are very rare, especailly the artificail one's like the dams,and therefore the aims of this study are:

1. To determine the birds species and the number of each species.
2. To classify the birds species into families and orders.
3. To asses the threatings that affects on the birds.

A reservoir generating hydroelectricity includes turbines connected to the retained water body by large-diameter pipes. These generating sets may be at the base of the dam or some distance away. Some reservoirs generating hydroelectricity use pumped re-charge in which a high-level reservoir is filled with water using high-performance electric pumps at times when electricity demand is low and then uses this stored water to generate electricity by releasing the stored water into a low-level reservoir when electricity demand is high. Such systems are called pump-storage schemes.

Methodology

The reservoir of Sinnar Dam was studied in the periods of 21/6/2010 and 31/5/2011 and 6/1/2012 at the both eastern and western bank of the river from the body of the dam and southwards till Kassab village. This method called Direct count. The birds were constantly watched from 7 o'clock in the morning to 6 o'clock in the evening by using telescope and binoculars. The birds species compared with the field guide of birds of Africa south of the Sahara and field guide of birds of east of Africa (Table 1).

Results

From the Table 1 it can be seen that there were annual variation in species and number of birds in the study area, and the total number of species was 39 species, recorded throughout the study period at the early rainy season, the number of species showed considerable fluctuation in some species, while there some species registered small variation.

There were some species occurred in the study which were not classified as water birds but they registered with them like African mourning Dove (Streptopelea decipiens), Laughing Dove (Streptopelea senegalensis), Little Swift (Apus affinis), Long tailed Starling (Lamprotornis caudatus), Rupple's Starling (Lamprotornis purpuropterus), Black Bulbul (Picnonotus barbatus) and Little bellied fire Finch (Lagonosticta senegala).

In 2010, the number of Open billed stork (Anastomus lamilligrus) was 111 while in 2011 was 6. Yellow billed stork (Mysteria ibis) was 79 individual in 2010, and no birds registered for the same species in 2011. The glossy Ibis (Plegadis falcinellus) was 90 in 2010 and no individual registered in 2011. The white faced whistling Duck (Dendrocygna viduata).

Discussion

In arid country like Sudan, water is the main factor in controlling the bird population. There were changes in number of species in the year 2010 and 2011 (Table 1) and this is maybe due to the amount of water storage in the reservoir as most water birds preferred the shallow water which provide nutrients that birds feed on.

There were marked increase in number of some species like Open billed stork, Yellow billed stork, Glossy Ibis and Black winged Stilt and this due to the shallow water at the reservoir and the windows of the Dam still opened while patchy areas emerged where the silt sediment and many kinds of grasses grows.

In the year 2011, the Great white Pelican appeared for the first time in the reservoir and there is no previous observation recorded, two individuals seen swimming in deep water after the Dam at the north. This side also preferred to the long tailed Cormorant which is diving bird but not like the Great white Pelican 76 individuals aggregated at a few meters from the windows. The Senegal thick-knee also found at the north side on the concrete walls in side water and this maybe the bird take his rest in the wall because it was always seen near the banks of the rivers or lakes.

The White faced whistling Duck registered about 700 individuals in 2011 at somewhere near the village of Kareema and this attributed to increase in the water level after the windows were closed for the purpose of storage so that the birds migrated southwards to the shallow water.

There were evidence indicates that the number of species of Sinnar dam reservoir may be more than the number of species study and this require more studies and monitoring to estimates the birds populations and the changes of them annually and seasonally.

	Family	Common name	Scientific name	2010	2011	2012
	Pelicandae	Geat white Pelican	*Pelicanusonocrotalus*		2	
	Ciconiidae	Abdim Stork	*Ciconiaabdimii*	7	16	
	Anhingidae	Long tailed Cormorant	*Anhigarufa*	5	76	6
		Open billed stork	*Anastomuslamilligrus*	111	6	
		Yellow billed Stork	*Mysteria ibis*	78		
		White faced whisitlingduk	*Dendocygnaviduata*	21	700	17
	Ardeidae	Black headed Heron	*Ardeamenocephala*	11	9	
		Grey heron	*Ardeacinerea*	8	4	3
		Squacco Heron	*Ardeolaralloides*	29	71	3
		Green backed night Heron	*Butoridesstriatus*		1	
		Cattle egret	*Bubulcus ibis*	16	5	7
		Little Egret	*Egrettagrezetta*			2
		Yellow billed egret	*Mesophoyxintermedia*	10		
		Greater cattle Egret	*Agretta alba*	55	26	26
	Threskiornitidae	Sacred ibis	*Threskiornisaethiopicus*	1		
		Glossy ibis	*Plegadisfalcinellus*	90		
		African Spoon bill	*Platelea alba*	7		
		Northern Pintail	*Anasacuta*			38
		Northern Shovellor	*Anascypeata*			2
		Eurasian Wigeon				5
		Garganey	*Anasquerquedula*			11
	Scolopacidae	Common Sandpiper	*Tringahypoleucos*	5		
		Wood Sandpiper				1
		Common red Shank				1
		Black winged Stilt	*Himanotopushimanotopus*			3
		Little Stint	*Clidrisminuta*	7		3
		Black tailed Godwit	*Limosalimosa*	8		10
		Ruff				22
	Burhinidae	Senegal Thicknee	*Burihinussenegalensis*	14	4	19
	Charadriidae	Spur winged plover	*Vannellusspinosus*	120	2	7
		Kittletz's plover				9
		Common ringed plover	*Charadrishiaticola*	5		
		Black headed lapwing	*Vannelustectus*	2	3	
		Whiskered Tern				19
	Jacanidae	African Jacana	*Actophilornisafricana*	2		
	Rallidae	Common Morhen	*Gallinulachloropus*	10		
	: Sternidae	White winged Tern	*Chlidoniasleucopterus*	7	6	
		Whiskered Tern		1		
	Recuvirostiridae	Black winged Stilt	*Himantopushimantopus*	88		3
	Alcedinidae	Pied kingfisher	*Cerylerudis*	1	8	5
	Apodidae	Little Swift	*Apusaffinis*	5		
	Pycnonotidae	Black Bulbul	*Picnonotusbarbatus*	6	8	
	Motacilidae	White Wagtail	*Motacilla alba*			1

Table 1: Birds of Sinnar Dam Reservoir.

Conclusion

The study gives important indicator for the water birds species in Sinnar dam reservoir, the number of species and the number of individuals and the annual variation among them and showed that there is a gap in some information and the need for monitoring for the dry season and the rainy season, roosting sites, level of hunting and nesting sites. The dam can be considered as an important site for some migratory birds like White Pelican, White faced Duck.

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