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Effects of Seasonal Variation on Fish Catching in Jebel Aulia Reservoir on the White Nile, Sudan

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Abstract

This study was conducted to see the effects of seasons on fish production, in jebel aulia dam south of Khartoum 45 km during the period January to December 2014, (containing12months) includes three seasons, summer, autumn, and winter. Twenty three species belonging to 14 families were recorded during the period of investigation. Distribution production of fish in seasons as follow: in summer the, high production is tilapia in March 61.2 %, April 53.3%, May 40%, finally june 32% . Bagrus bayad in March 9.9%, April 5.6%, may 12.6% , finally 4.9% in June.. The fish which is rare is Disticodus niloticus and Cithrius cithrius .High production months in the Summer are June 36%, April 23%, March 21% and May 21%. In Autumn the fish species which very High production is tilapia in July 25.9%, oughust 31.6%, September 33.5% and October 9.9%. Followed by schal fish and labeo niloticus. In winter the study found the high production of species is tilapia, labeo niloticus and Hydrocon Forskalli. The months which is high production in winter containing November, December, February and January. The study showed that the fish production seasons are Summer 37.15%, Autumn 35.95% and finally Winter 26.90%.

Keyword: Jebel Aulia Dam, Reservoir, Seasons, fish species, investigation production, and variation.

INTRODUCTION

Jebel Aulia Dam was constructed in 1937 a cross the White Nile some 45 kilometers south of Khartoum. It resulted in the formation of larger shallow lake and covered estimated area of about 12,000 hectares. The Dam stores about 3. 5 Millard cubic meters of water. Maximum depth of the reservoir is about 15 meters during the time of high flood (late August to mid- September) while a minimum depth of 5 meters is attained in May, when the reservoir is nearly emptied to a normal river level. Fish and fisheries of White Nile have been investigated by several workers. The taxonomy and characteristic of fish were compiled by [1](1907) in his treaties or fish fauna of the Nile. [2](1948) recorded 18families and 62 species from the swamps and the southern tributaries of the white Nile. The feeding and breeding habits of some common Nile fish were studied by[3]((1919) and his investigations were further extended by [4] (1953). [5]((1953) investigated the fishes of northern Bahr Elgazal and stated that fishing follows the seasonal regime of flooding and fallowing water. One hundred and eight species were recorded by [6] ((1950) from the Sudan waters of the white Nile system. They belonged to 51 genera and 23 families. More recently [7] (1972) reported that the fish fauna of the Nile basin is rich and diversified and includes at least 54 genera and well over 300 species. [8] (1967) carried out a detailed study on the biology of genus Synodontis at Khartoum which its establishment of Synodontis khartoumensis as a new species. The present paper, however is an attempt to consider the distribution and abundance of fish of the White Nile in the area affected by Jebel Aulia Dam.

MATERIALS AND METHODS

The area investigated was Jebel Aulia Dam two sets of gill nets were used to catch the fish the first set with mesh size ranging between 40 – 120 mm and 1.5 – 2 meters in depth. The second set of gill nets had a mesh size ranging from 70 – 90 mm and 1.55 – 1.80 meters in depth. Gill nets were set overnight. The catch was sorted out immediately after collection and fish identified down to species level. Total weight of fish was recorded in (kg). The period of study was (January- December) 2014

RESULTS

Fish population in the study area obtained 23 species belonging to 14 families were recorded during the period of investigation. These are listed as follows in table (1). In summer tilapia fish, and Bagrus bayad is high production in month March, April, May and June. The rare fish were Disticodus niloticus and Cithrius cithrius in table (2). High production of months in Summer is June 36%table (3). In Autumn also tilapia and labeo niloticus is high production table (4).months of Autumn which is high are

july,October,oughust and September table (5).in Winter also tilapia, labeo niloticus and Hydrocon Forskalli is high production but the fish was very rarely is bynii, cithrus, distichodus and labeo horii table (6).high months in production in winter is November , December and February table (7)the study show the high season in production is summer 37.15%, Autumn 35.95% and winter 26.90% table (8). The boats were made of woods, metal, and fiberglass. Gill net and cast net are very famous nets in the Reservoirs. The boats made of locally woods table (9)

Table (1) Show the families and species of the study

Family (14)	Species (23)
(1) Mormyridae	1- Mormyrus caschive 2- Mormyrus bebe 3- Mormyrus cyprinoids
(2) Mochokidae	1- Synodontis schall
(3) Bagridae	1- Bagrus bayad 2- Bagrus domac 3- chrysichthys auratus 4- Auchenoglanis occidentals
(4) characidae	1- Alestes dentex 2- Hydrocynus forskalli 3- Alestes nurse
(5) Citharinidae	1- Disticodus niloticus
(6) Schilbeidae	1- Schilbe mystus
(7) Cyprinidae	1- labeo niloticus 2- Labeo horii 3- Barbus bynii
(8) Cichlidae	1- Oreochromis niloticus
(9) Clariidae	1- Clarias lazera
(10) Protopteridae	1- protopterus aethiopicus
(11) Centropomidae	1- lates niloticus
(12) Tetraodontidae	1- Tetraodon lineatus
(13)Malapteroidae Malapteroidae	1- Malapterurus electricus
(14) Osteoglossidae	1- Heterotis niloticus

Table 2 showed fish production in months of summer 2014

Species	**March**		**April**		**May**		**June**	
	Wt(kg)	%	Wt(kg)	%	Wt(kg)	%	Wt(kg)	%
Lates .niloticus	385.28	0.7	677.57	1.2	868	1.6	961	1.1
Bagrus domac	93	0.2	150.57	0.3	48.71	0.1	318.86	0.3
Bagrus bayad	5194.71	9.9	3255	5.6	6642.86	12.6	4455.14	4.9
Tilabia .niloticus	32200.14	61.2	31093	53.3	21040.1	40.0	29255.1	32.0
Labeo niloticas	4003.43	7.6	10978.4	18.8	9007.71	17.1	16443.3	18.0
Barbus bynni	75.26	0.1	252.43	0.4	279	0.5	828.4	0.9
Labeo horii	0	0.0	0	0.0	0	0.0	0	0.0
Kanumm sp	93	0.2	212.57	0.4	788.29	1.5	366.57	0.4
Distichodus niloticus	0	0.0	0	0.0	75.29	0.1	53.14	0.1
Cithrius cithrius	0	0.0	0	0.0	0	0.0	0	0.0
Synodontis schall	29..1098	2.1	1266.57	2.2	1501.29	2.9	21124.3	23.1
Alestes dentex	1240	2.4	1266.57	2.2	1302	2.5	1377.29	1.5
Clarias lazera	2896.28	5.5	4424.14	7.6	4561.43	8.7	4867	5.3
Hydrocon Forskalli	1217.85	2.3	1049.57	1.8	2338.29	4.4	1603.14	1.8
Shelbe mystes	261.28	0.5	314.43	0.5	766.14	1.5	744	0.8
Other	3835.14	7.3	3343.57	5.7	3432.14	6.5	9114	10.0
Total	52593.66	100.0	58284.39	100.0	52651.25	100.0	91511.24	100.0

Table 3: Show months of summer and production kg

Months of summer	Production(kg)	%percentage
March	52594	21 %
April	58284	23 %
May	52651	21 %
June	91511	36 %
total	254740	100 %

Table 4: Howed fish production in months of autumn 2014

species	**July**		**Aughest**		**September**		**Octoper**	
	Wt(kg)	%	Wt(kg)	%	Wt(kg)	%	Wt(kg)	%
lates.niloticus	1169.11	1.6	635.71	1.1	827.14	1.5	681.43	0.1
Bagrus domac	172.71	0.2	270	0.5	205	0.4	381.43	0.1
Bagrus bayad	4034.72	5.6	2044.29	3.5	3325.71	5.9	6930	1.2
tilabia.niloticus	18639.9	25.9	18475.71	31.6	18831.43	33.5	59258.57	9.9
Labeo niloticas	13666.6	19.0	8961.43	15.3	7787.14	13.9	17288.57	2.9
Barbus bynii	66.43	0.1	7.57	0.0	0	0.0	0	0.0
Labeo horii	0	0.0	12.86	0.0	0	0.0	488.57	0.1
Kannume sp	571.29	0.8	244.29	0.4	180	0.3	0	0.0
Disticodus niloticus	97.43	0.1	0	0.0	30	0.1	0	0.0
Cithrius cithrius	0	0.0	0	0.0	0	0.0	11472.86	1.9
Synodontis schal	18205.9	25.3	12882.86	22.1	8400	15.0	1015.71	0.2
Alestes dentex	819.29	1.1	9092.80	15.6	668.57	1.2	7920	1.3
Clarias lazera	4464	6.2	2502.86	4.3	4285.71	7.6	1345.71	0.2
Hydrocon Forskalli	1169.14	1.6	1002.86	1.7	801.43	1.4	660	0.1
Shelbe mystes	624.43	0.9	890.71	1.5	775.71	1.4	55774.29	9.3
Other	8356.71	11.6	1398	2.4	10050	17.9	435623	72.7
total	72057.66	100.0	58421.95	100.0	56167.84	100.0	59884.14	100.0

Table 5. Show months of autumn and production kg

Months of autumn	Production(kg)	%percentage
June	72058	29.2 %
August	58422	23.7 %
September	56188	22.8 %
October	59884	24.3 %
total	246532	100 %

Table 6. Showed fish production in months of winter 2014

species	**November**		**December**		**January**		**February**	
	Wt(kg)	%	Wt(kg)	%	Wt(kg)	%	Wt(kg)	%
lates.niloticus	801.43	1.0	681.43	0.2	540.14	2.2	1085	2.9
Bagrus domac	827.14	1.0	38143	9.9	513.71	2.1	496.71	1.3
Bagrus bayad	4165.71	5.0	6930	1.8	1483.57	6.0	3038	8.1
tilabia.niloticus	33407.14	39.9	59258.57	15.4	15256.43	61.3	21908.14	58.5
Labeo niloticas	15810	18.9	17288.57	4.5	1377.29	5.5	2329.43	6.2
Barbus bynii	0	0.0	0	0.0	354.29	1.4	403	1.1
Labeo horii	0	0.0	0	0.0	0	0.0	0	0.0
Kanumm sp	420	0.5	48857	12.7	84.14	0.3	234.71	0.6
Distichodus niloticus	0	0.0	0	0.0	0	0.0	0	0.0
Cithrius cithrius	0	0.0	0	0.0	0	0.0	0	0.0
synodontis schall	2790	3.3	11472.80	3.0	987.57	4.0	669.43	1.8
Alestes dentex	1307.14	1.6	1015.71	0.3	752.86	3.0	1204.5	3.2
Clarias lazera	4264.29	5.1	9720	2.5	552.71	2.2	1970.71	5.3
Hydrocon Forskalli	9272.86	11.1	134571	35.0	1155.86	4.6	1160.29	3.1
Shelbe mystes	604.29	0.7	660	0.2	513.17	2.1	394.14	1.1
Other	9972.86	11.9	55774.29	14.5	1324.14	5.3	2568.57	6.9
	83642.9	100.0	38437.24	100.0	24895.9	100.0	37462.6	100.0

Table 7. Show months of winter and production kg

Months of winter	Production(kg)	%perecentage
November	83643	45.4 %
December	38437	20.8 %
January	24896	13.5 %
February	37463	20.3 %
total	184439	100 %

Table 8. Show seasons viration and fish production 2014

seasons	**Fish production**	**%**
Summer	**254.741**	**37.15 %**
Autumn	**246.532**	**35.95 %**
Winter	**184.439**	**26.90 %**
total	**685.712**	**100 %**

Table 9. Show the boat , net and kind of wood in fish catching

Boat kinds	Nets kinds	Woods kinds
Wood boat	**Gill net**	**haraz**
Metal boat	**Cast net**	**sonut**
sharoug	**crabs**	**neem**
flouka		**mahogani**
Fiber glass		**sayal**

DISCUSSION

The study showed that high production was recorded in summer season 37.145%,autumn 35.95% and finally winter 26.95%.

Twenty three species and 14 family were found in the study.The important species in this study were Oreochromis niloticus , labeo niloticus and Synodontis schall .the rare fish in the dam were Disticodus niloticus ,labeo niloticus and Cithrius cithrius. The present study agree with [9] (2010) he found 14 family and 21 species . The study agree with [10] (2012) that the boats in jebel aulia was made from woods, metal, shroug and fiberglass. Otherwise the local name of the nets were gill nets and caste net.the kinds of wood by local name are Haraz, Sonut, Neem and Sayal.. [2] (1948) recorded 18families and 62 species from the swamps and the southern tributaries of the white Nile.) but in this study found 14 family only.. One hundred and eight species were recorded by [6] (1950) from the Sudan waters of the white Nile system. They belonged to 51 genera and 23 families. But in this study 14 family maybe return to periods between the two study. More recently [7] (1972) reported that the fish fauna of the Nile basin is rich and diversified and includes at least 54 genera and well over 300 species. [8] 1967 studied all fishes in Sudan but this study is included only jebel aulia dam

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RECOMMENDATION

-you must be catching in summer seasons because the production is high

- you must catch by legal methods to avoids overfishing

- you must to study the reasons for rare fishes
- you most avoid the small fish catching

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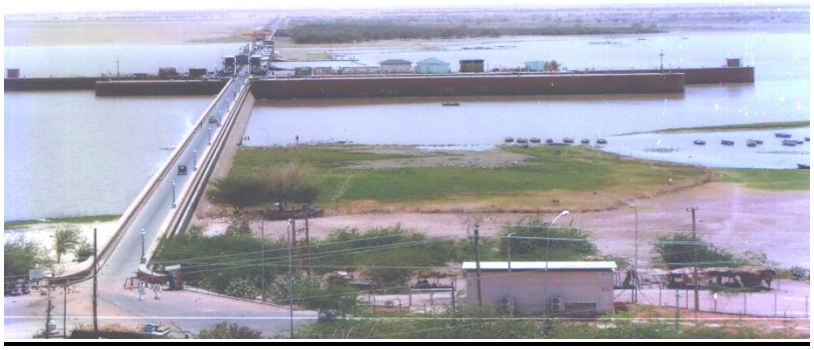

Figure 1: Show the jebel aulia dam (location study)