



FISH FARMERS' PERCEIVED ENVIRONMENTAL EFFECTS ON DAM OPERATION AND COPING STRATEGIES USED IN IKERE GEORGE DAM OF ISEYIN, OYO STATE

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ABSTRACTS

The study examined the fish farmers' perceived environmental effects of dam operation and coping strategies among fish farmers in Ikere George dam, Iseyin Oyo state. Multi stage sampling technique was used to select 102 respondents in the study area. Data were collected through the use of interview schedule and were analysed using descriptive statistics such as percentage and frequency, while chi-square and PPMC were used to analyse hypotheses at $p < 0.05$. The result revealed that majority (54%) of the respondents below 40 years, with males predominantly higher than females. Also, 71.6% were married and 58.8% had educational attainment below secondary school. Challenges identified were disruption of movement of aquatic animals (137), blockage of migrations of aquatic species (135) and problem of overcrowding in the community (129) were prominent perceived effects of dam operation. The result further showed that migration (99) and planting of trees (146) were the most commonly used coping strategies. Chi-square showed that there was significant relationship between socio-economic characteristics of the respondents and perceived effects of dam operation except religion which was not significant ($p > 0.05$). PPMC analysis revealed that there was significant relationship between coping strategies used ($r = 0.687$, $p = 0.000$). It is therefore recommended that proper training and adequate facilities should be given to fish farmers to ensure sustainability of the dam.

KEYWORDS: perceived effects, operation, dam, coping strategies, fish farmers

INTRODUCTION

Dams have made important contributions to human development, and the benefits derived from them have been considerable (World Commission on Dams, 2000). With the rising global population and desire to increase quality of life, dams are prominently staged to produce hydropower, irrigation, and drinking water supplies, recreation, navigation, and many other resources to the growing planet. Further, the uncertainty of the future climate regime may mean that dams will play an increasingly important role in water resources. For example, it was predicted that drought affected areas will likely increase and flood risks will be augmented in response to increase frequency of heavy precipitation (IPPC, 2007), the two effects may be ameliorated by dam construction.

At the same time, dams are increasingly slated for removal, reflecting a growing concern over their adverse ecological, social and economic impacts (Pejchar and Warner, 2001). Aging structures, which can pose a risk to public safety, are increasingly removal projects (Heinz center, 2002). Dam removal is also emerging as a promising option for restoring continuums and recounting habitats for migrating fish species including anadromus salmon, which are federally listed as threatened or endangered in the United States (Gregory et al., 2002). However, there is a great deal of uncertainty about the consequences of dam removal (Aspen Institute, 2002; Hart et al., 2002), particularly the unknowns related to the extent, magnitude, and timing of physical and ecological outcomes (Heinz center, 2001; Hart et al., 2002).

Large dam are those greater than 15 metres (m) in

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height from the base to crest, or storage capacity exceeding 3 million cubic meters for height between 5 and 15 m (International Commission on large Dam, 2003), often play a key role in water management. The purposes of dam usually including provision of water for irrigation, drinking and domestic water supply to cities, improving navigation, generating hydro-electric power and flood control. Although dams have been built in the world since time immemorial, dam construction was earlier considered not being possible, though needed, because of lack of adequate design knowledge, construction equipments, materials like cements and concrete and technology of construction. Also, economic conditions and institutional capacity existing in countries that needed large dams, and did not enable them to meet up.

The Ikere George Dam is a major earth fill dam in Iseyin Local Government of Oyo state in the south west of Nigeria on the Ogun River. Reservoir capacity is 690 million m³. The dam was initiated by the military regime of General Olusegun Obasanjo and started in 1983 by the administration of Sheu Shagari. The dam was planned to generate 3750MW of electricity, to supply water to local communities and to Lagos and to irrigate 12,000 hectares of land. This dam was abandoned by subsequent military governments. A report for the UN in 2004 said that no irrigation had taken place so far, but efforts were being made to implement one of the five planned irrigation projects. The project was based on the sprinkler system which is difficult to manage and requires the training of farmers.

The contribution of large hydraulic infrastructure, particularly dams, to development remains controversial. The controversy stems from the fact that, too often in the past, the construction of dams has brought fewer benefits than envisaged and has resulted in significant social and environmental cost (World Commission on Dam (WCD, 2000). Historically, Dam projects have often failed to pay sufficient attention to environmental impacts and these (invariably poor) people adversely affected by the construction and operation of the dam and associated water management system. Those who had to be resettled and those whose livelihoods are

affected by changes in river flow regimes have tended to pay the price of dam construction. Even where the negative impacts were associated 'a priori' often those making decisions, but were rarely impacted personally derived "sacrifices" to be accepted in light of the benefits that would subsequently accrue (Beekman, 2002).

The general objective of this study is to examine fish farmers' perceived environmental effects of Dam operation and coping strategies used in Ikere Dam Oyo state. The specific objectives are: to describe socio-economic characteristics of the respondents; to determine perceived environmental effects of Dam operation in the study area and to examine coping strategies used by the respondents in the study area

METHODOLOGY

The study was carried out in Ikere Iseyin local Government Area of Oyo state. Iseyin is city located in the Oyo state Nigerian state of Oyo. It is approximately 100 kilometers North of Ibadan. The city is estimated to have a population of 236, 000 (NPC, 2006). The primary industry of the area is cotton based textiles. Iseyin city is the third largest city in Oyo state. The Ikere Gorge dam is located in the city. It was said to be the second largest dam when it was discovered alongside Kanji dam during Obasanjo regime (Military).

Target population of this study was the fish farmers in Ikere, Iseyin Local Government Area of Oyo State.

The sampling was carried out by visiting identified villages adjacent to Ikere dam in Iseyin Local Government Area of Oyo State. The questionnaire was targeted at the neighbouring villages to the dam. The questionnaires were administered to the fish farmers in four neighbouring villages, Speed way village, Bendel village, Agatu and Irawote village. Also, 50% of the respondents was selected in each village i.e. Speed way village (34), Bendel village (26), Agatu village (23) and Irawote village (38) which gave a total number of one hundred and twenty one (121) respondents out of which 102 questionnaires were retrieved.

RESULT AND DISCUSSION

Table: Socio-economic characteristics of the respondents

Variables	Frequency	Percentage
Age		
20-29 years	22	21.6
30-39 years	33	32.4
40-49 years	43	42.2
50 years & above	4	3.9
Total	102	100
Sex		
Male	90	88.2
Female	12	11.8
Total	102	100
Religion		
Christianity	51	50.0
Muslim	51	50.0
Traditional	0	0
Total	102	100
Marital status		
Single	11	10.8
Married	73	71.6
Divorced	2	2.0
Widow	16	15.6
Total	102	100
Educational level		
No formal education	15	14.7
Primary education	45	44.1
Secondary education	42	41.2
Tertiary education	0	0
Total	102	100

Table 1 showed that 88.8% of the respondents were male and below 50 years. Also, 71.6% were married and practiced both Christianity (50%) and Islamic (50%)

religion. Majority (58.8%) of the respondents had education below secondary school level.

Table 2: Perceived environmental effects by the respondents

Perceived effects	No effect	Low effect	Moderate effect	High effect	Weighted Score
Decrease of water quality	39(38.2)	46(45.1)	17(16.7)	0(0.0)	80
Seasonal timing of water yield	52(51.0)	33(32.4)	17(16.6)	0(0.0)	67
Rivers affected by dams and diversion	56(54.9)	13(12.7)	33(32.4)	0(0.0)	79
Natural distribution of stream flow	39(38.2)	29(28.4)	34(33.3)	0(0.0)	97
Creates warming potential to the environment	39(38.2)	49(48.0)	5(4.9)	0(0.0)	59
Disrupt the movement of aquatic animals	0(0.0)	70(68.6)	29(28.4)	3(2.9)	137
Block the migrations of aquatic species	0(0.0)	72(70.6)	27(26.5)	3(2.9)	135
Change in clinical composition of water	99(97.1)	2(2.0)	1(1.0)	0(0.0)	4
Lead to direct death of aquatic animals	15(14.7)	85(83.3)	2(2.0)	0(0.0)	89
Causes of flooding from dam	0(0.0)	100(98.0)	2(2.0)	0(0.0)	104
Displaced by dam	102(100)	0(0.0)	0(0.0)	0(0.0)	0
Loss of houses	5(4.9)	78(76.5)	19(18.6)	0(0.0)	116
Problem of overcrowding in community	21(20.6)	33(32.4)	48(47.1)	0(0.0)	129
Loss of cultural resources (shrine or sacred place)	79(77.5)	4(3.9)	19(18.6)	0(0.0)	42

The results in Table 2 indicate the perceived effects of the respondents according to the weighted score. The perceived effects were based on three categories; ecological, social and health. The result showed that the

disruption of the movement of aquatic animals (137), blocking of the migration of aquatic animals (135) and flooding resulted from the dam (104) were ranked as prominent effects in descending order, while seasonal

timing of water yield (67), creation of warming environment (59) and change in water composition (4) were the least perceived effects. Also, result of perceived effects based on social variations revealed that problem of overcrowding in the community (129) and loss of houses (116) were identified as prominent effects of dam operation. Meanwhile, displacement by

dam (0) had no effects as perceived by the respondents. The result on perceived health effects indicated that, malaria transmission (79). This is in line with findings of Babagana et al (2015) which stated that malaria is a major health problem associated with construction of dam.

Table 3: Coping strategies used by respondents

Coping strategies used	Never	Occasionally	Regular	Weighted score
Construction of drainages	99(97.1)	3(2.9)	0(0.0)	3
Reliance on extension agent information	100(102)	0(0.0)	0(0.0)	0
Migration	2(2.0)	99(97.1)	0(0.0)	99
Livestock insurance	100(98.0)	2(2.0)	0(0.0)	2
Creation of artificial habitat for fish farming	100(98.0)	1(1.0)	1(1.0)	3
Planting of trees around the house	4(3.9)	50(49.0)	48(47.1)	146
Construction of flow channel	100(98.0)	1(1.0)	1(1.0)	3

Table 3 revealed the coping strategies used by the respondents in the study area. Planting of trees around the house (146) and migration (99) were commonly used as their coping strategies. The implication is that

the people should be encouraged to use more of the coping strategies that are environmentally friendly and also, those that can improve their standard of living.

HYPOTHESES

Table 4: Chi-Square analysis of socio-economic characteristics and perceived environmental effects

Variable	Chi-square	p-value	Decision
Sex	8.501	0.014	S
Religion	0.399	0.819	NS
Marital status	32.004	0.000	S
Educational level	12.152	0.016	S

Table 5: PPMC analysis showing coping strategies and perceived environmental effects

Variable	r-value	p-value	Decision
Coping strategies and perceived environmental effects	0.687	0.000	S

The result of the hypothesis (Table 5) showed that there was significant relationship between coping strategies adopted by fish farmers and their perceived environmental effects of dam operation. The implication is that as they perceived environmental effect of dam operation, various coping strategies were put to use in order to reduce the social, economic and health effects on the respondents.

CONCLUSION

These studies revealed that majority of the respondents are males (89%), in their active age (less than 50 years), Christians (50%), Muslim (50%) and few primary and secondary educations with 59% having no formal education. The perceive environmental effects of dam operations were high in the aspect of disruption of aquatic animal movement (137), block the migration of aquatic animals (135), problem of overcrowding in community (129), loss of houses (116) and flood caused by dam (104) while minimal effects included displaced

by dam (0), change in water composition (4), loss of cultural resources (42) and creating warming potential to the environment (59) according to the respondents. Based on the research and findings of this study, it could be concluded that the dam operation has no much adverse effects on the respondents.

RECOMMENDATION

Based on the findings of the study, the following are recommended;

- I. Government should make use of the dam for generating electricity for the country,
- II. The dam should be used for irrigation system for crop farmers, so as to increase the production of farm produce,
- III. The dam should also serve as a source of water supply for residents in the nearby state,
- IV. There should be proper training and enough facilities for the fish farmers to enable them increase fish production,

V. Since Ikere Dam is the second largest dam in Nigeria, it should be developed to make it environmental friendly for tourism.

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