FISHERIES AND TOURISM POTENTIALS OF AGBOKIM WATERFALLS, NIGERIA

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ABSTRACT

Human activities in natural environments are among the most important recreational needs. Monthly studies of tourism characteristics was conducted during wet and dry seasons, over a two year period in the three landscapes along the 6817.7m length of Agbokim waterfalls by using a close-ended pre-coded survey instrument. Through MANOVA analysis of the 1780 respondents, we found strong positive association between peoples visits to the recreational areas and the type of landscape in which the respondents felt happy. People who felt happier in landscape dominated by waterfalls, visit the middle reaches of the river for outdoor recreation more often while people who feel happy in landscapes dominated by slow water current with an extensive wide area and floodplains, visit downstream reaches of the waterfalls more often. Activities performed more often along downstream reaches include fishing, bathing/swimming, boating and hunting while more frequent activities in the middle reaches (waterfalls) include taking photographs, picnics, enjoying nature, outing with family and friends, looking at view, resting and relaxing.

Key Words: Agbokim waterfalls, fishing activities, recreational activities, andscapes,

INTRODUCTION

A wide variety of recreational needs have been presented (Velarde,*et al* 2007, Annastedt *et al.*, 2010) and all indicated that recreation in natural environments can bring about a quick and strong recovery in stressed individuals. Findings showed that some particular characteristic of nature are more efficient stress recovery such as species richness (Grahn and Stigsdotter 2010), broadleafed forest (Annastedt *et al* 2010), waterfalls and lakes (Gross and Brown 2008) and human activities such as fishing, boating and hunting (Bodin and Hartig 2003). Nature-related activities like fishing in natural environment are benefiting to people's health (Sugiyama and Ward Thompson 2007). Waterfalls and fisheries had received very little attention from researchers the world over. In Africa, the reason being that, waterfalls were named after deities and were used as places of traditional and ancestral worships. In other places, the intensity of waterfalls and pressure generated from it due to gravity has given the impression of a lifeless zone (Chernicoff *et al.*, 1997). Knowledge of waterfalls systems in Africa are therefore limited to hydrology and geological features (Fischer and Harris 2003; Chester *et al.* 1999), natural monuments for revenue generation because of their ecotourism potentials especially sport fishing (Ayodele 1988). Artisanal sport fisheries are widely practiced and are the most popular form of outdoor recreational fishing (Norling 1968). It provides significant social, cultural and economic benefits to man (Prosser 1996). Sport fishing is a form of small scale –fishery for the fun of it (Brandt 1984). Simple fishing gears are used, while the catches are designed not to make a living but to concentrate skills for fun.

METHODOLOGY

Study Area

The study area is Agbokim Waterfalls in Cross River State, Nigeria, latitude $5^0 59'$ North and longitude $8^0 45'$ East. It is bounded in the West by the Cross River and in the North by the Cameroon high forests. For the purpose of this study, the 6817.7m long waterfall is divided into three landscape types; upstream (agricultural plains), midstream (mountain region and waterfalls) and downstream (forest environment). Upstream is 2003.13m long with substrate of gravel and rocks under fast water current and shoreline covered with high forest and cocoa farms, Midstream length of 807.42m has substrates of sand and rocks under heavy water turbulence with shoreline sparsely shaded with vegetation while downstream length, 4007.15m has fine sand and clay under slow water current with an extensive wide area.

Public survey

The study designed and administered a close-ended pre-coded instrument to conduct a survey of communities located in the study area. A representative sample of people living in neighboring communities around the Agbokim waterfalls was obtained and they performed the task by sending questionnaires to randomized sample of members of the communities. The questionnaires were sent by hand to randomly selected individuals age 18 to 82 years. A total of 2000 questionnaires were sent and a total of 1780 was completed and returned. The response rate was thus 89 %. We associated the respondents' background data concerning addresses with the three main landscape types. An examination of respondents' profiles showed that the distribution of socio-demographic data is representative of the general situation in Agbokim waterfalls communities. This means no significant statistical deviation existed with regards to socio-economic groupings (SES).

Perceptions of landscape

The questionnaire included the questions: Do tourist visit the Agbokim waterfalls? Which of the landscape do they visit most? Which category of tourist that visit the waterfalls? How often do people visit each of the landscape under the study area? What are the reasons for tourists visit to Agbokim waterfalls? When do tourists visit the waterfalls? What role does government play in the management of the Agbokim waterfalls? What infrastructural facilities are in and around the Agbokim waterfalls? How often do tourist perform a certain outdoor activities (swimming, boating, fishing, hunting)? In which of the landscape do tourists fill most at home? State one or more alternative(s). landscape dominated by 1. Agricultural plains (upper reaches), 2. Forest areas (down reaches) and 3. Waterfalls and mountains (middle reaches). These alternatives correspond to the main landscape types in Agbokim waterfalls.

Fish species composition and distribution in Agbokim Waterfalls were obtained indirectly from earlier work by Ikpi and Offem (2011). An estimate of standing stock of fish was made, using the formulae by Henderson and Welcome (1974) as:

$S = B/A$ (1). Which expresses the basic interrelationship between annual catch in wet weight, standing stock size (B) and area covered (A). Sum of total fish landings for the 3 reaches gives estimate for the entire river.

Data Collection

Data were analyzed using descriptive statistics (mean, standard deviation and percentage). Comparison of data from reaches was carried out using analysis of variance (ANOVA) (Steal and Torrie, (1980). The respondent answers were statistically analyzed using multivariate analysis of variance (MANOVA) and the statistical software SAS (SAS Statistical, 2009).

RESULTS

Perception of landscapes: A MANOVA analysis (SAS GLM) between the landscape the respondent feels happy and how often they visit the three recreational landscapes showed that only two of the natural landscapes were frequently visited for excursions, which were not of the same magnitude. Through MANOVA analysis of the 1780 respondents we found strong positive association between peoples visits to the recreational areas and the type of landscape in which the respondents felt happy. For instance, people who felt happier in landscape dominated by waterfalls, visit the middle reaches of the river for outdoor recreation more often ($p< 0.0001$), while people who feel happy in landscapes dominated by slow water current with an extensive wide area and floodplains, visit downstream reaches of the waterfalls more often ($p< 0.0001$). A few respondents with interest in fast water current and shoreline covered with high forest and cocoa farms visit the upper reaches more often ($p< 0.0001$). The MANOVA test shows an overall effect concerning associations between interest in a certain type of landscape and visits to different types of recreational areas, except for the few people who have interest in fast water current and shoreline covered with high forest and cocoa farms. People's socio-economy did not affect any relationship. However, visiting a "beach/bathing place" at the waterfalls or downstream reaches was significantly associated with people's gender, and this relationship concerned the mid-stream and down- stream reaches: women visit these recreational areas more often.

Out-door activities

A T-test analysis performed between the type of landscape the respondent feels happy and the 12 single activities (outcome) showed that the most frequently performed outdoor activities were fishing, boating, bathing followed by enjoying nature and taking photographs, hunting and outings with family and friends. T-test of respondents who feel happy in landscapes dominated by one landscape type versus people who feel happy in another landscape type showed that activities performed more often in downstream reaches include fishing ($p<0.0001$), bathing/swimming ($p<0.001$), boating ($p<0.01$) and hunting ($p<0.01$). Activities performed less often include outing with family and friends ($p<0.001$), taking photographs (0.001), picnic ($p<0.01$), enjoying nature ($p<0.01$) and going out to be myself ($p<0.05$). Activities performed more often in the middle reaches (waterfalls) include: Taking photographs ($p<0.0001$), picnics ($p<0.0001$), enjoying nature ($p<0.001$), outing with family and friends ($p<0.001$), looking at view ($p<0.01$), resting and relaxing ($p<0.05$). Activities performed less often include: fishing ($p<0.001$), hunting ($p<0.01$), bathing ($p<0.01$) and sunbathing ($p< 0.05$). Activity performed more often in the upper reaches includes: looking at the view ($p<0.05$), Fishing ($p<0.001$).

DISCUSSION

Recreational landscapes and activities in Agbokim waterfalls

The attachment to a certain type of landscape, including activities relating to that kind of landscape is determined by habits originating from previous life experiences. With the interpretation of our results concerning which type of the three landscapes in our study area people choose as places of recreation and for recreational activities is strongly influenced by the environment. The study showed that people who feel at home

with a particular type of landscape do visit recreation areas associated with that type of landscape more often. This pattern can possibly be due to the fact that our respondents became attached to this type of nature during their childhood and adolescence. Moreover, our results clearly showed that people who feel at home in a particular type of landscape perform certain outdoor activities more often, which may be because since childhood, have deeper understanding that these activities can be best accomplished there. The result are thus interpreted that people tend to devote themselves to activities associated to where they feel they belong. Our finding support earlier studies by Kyle *et al* (2003), Gross and Brown (2008), who maintained that place attachment is an important factor to consider in explaining recreation behavior. Moreover these finding seem to support attachment phenomena connected to old concept of Heimat (Applegate 1990, Blickle 2004). Consequently, whether or not our respondent have moved, feeling at home in a particular type of landscape has importance for their choice of setting and recreational activity. For instance, people who feel at home in the middle and lower reaches of the waterfalls choose bathing and sunbathing. We interpret this as a kind of attachment process (Kyle *et al*, 2003, Mastern and Coatsworth 1998).

Table 1 Association between performing certain recreational activities and having preference to certain landscape area.

Recreational activity	Upriver	Midriver	Downriver
Fishing	6.7 ($p < 0.001$)	5.6 ($p < 0.001$	12.4 ($p < 0.0001$)
Swimming	1.5 (ns)	1.2 (ns)	17.8 ($p < 0.0001$)
Bathing	0.7(ns)	6.6 ($p < 0.01$)	18.8 ($p < 0.0001$)
Boating	1.2 (ns)	1.1 (ns)	10.3 ($p < 0.01$)
Hunting	0.7(ns)	2.8 ($p < 0.001$)	8.5 ($p < 0.01$)
Enjoying nature	1.5(ns)	7.8 ($p < 0.001$)	3.5 ($p < 0.01$)
Taking photographs	0.8 (ns)	17.7 ($p < 0.0001$)	4.4 ($p < 0.001$)
Outing with families and friends	0.2(ns)	8.9 ($p < 0.001$)	3.2 ($p < 0.001$)
Going out to be myself	0.8 (ns)	1.0 (ns)	4.3 ($P < 0.05$)
Picnics	0.2 (ns)	14.4 ($p < 0.0001$)	3.7 ($p < 0.01$)
Looking at view	5.4 ($p < 0.05$)	5.6 ($p < 0.01$)	3.0 ($p < 0.01$
Resting and relaxing	1.0 (ns)	7.6 ($p < 0.05$)	1.1 (ns)
Sun bathing	0.7 (ns)	3.4 ($p < 0.05$)	1.9 (ns)

CONCLUSION

Upstream and downstream reaches, makes fishing, game hunting and photographing as the most favorable recreational activities of these landscape. The waterfalls middle reaches are for sunbathing, bathing, picnics, Outgoings with family and friends, resting and relaxing. Management strategies to improve tourism potential of Agbokim waterfalls must include: Legislation against water pollution, control and regulatory measures by community leaders.

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