



Assessment of the Economic Benefits of Conservation Activities at Kwano Chimpanzee Forest Habitat in Gashaka Gumti National Park (GGNP), Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJRAF/2023/v9i3223

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/103096>

Original Research Article

Received: 11/05/2023

Accepted: 19/07/2023

Published: 29/07/2023

ABSTRACT

The assessment of the economic benefits of the conservation of the Kwano chimpanzee forest habitat for sustainable conservation in GGNP, Nigeria was primarily aiming at assessing the economic benefits derived so far by the indigenes of the Gashaka village which is the closest settlement to the forest and the GGNP staff for the purpose of improving sustainable conservation within the park. Data was collected through Purposeful or Judgmental Sampling by standardized face-to-face interviews scheduled according to Ezebilo et al. [1] by the help of questionnaire. Most (67.5%) of the respondents were males, age classes for Gashaka residents had a mean of 44±1.89 and 39±1.57 for the Park Staff; 67.5% were primary school leavers, 14.71% had no formal education; 52.94% were farmers, 5.88% civil servants; 92.31% were married, 7.69% unmarried;

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household size in Gashaka had a mean of 4 ± 0.14 and for Park staff was 4 ± 0.18 . Mean cash income for Gashaka community= ₦35,333 \pm 7,090.68; Park Staff= ₦22,083 \pm 5,545.18. All the respondents (79.41% for Gashaka residents and 100% for Park staff) claimed employment, physical cash and the provision of social amenities: health, education, road, borehole as benefits gained from conservation activities. More benefits are generated by the local communities during the dry months with the highest being in February (₦45,000), ₦43,000 in March and ₦41,000 in April while least in the wet months of August (₦23,000), ₦25,000 in July and ₦28,000 in September for Gashaka community whereas for Park Staff it was April (₦29,000), ₦28,000 in May and ₦27,000 in January and least in August (₦13,000), ₦14,000 in September and ₦14,000 in November. Collaborating with traditional rulers (100%), creation of more jobs (100%) were some of the suggested strategies for conservation.

Keywords: Assessment; chimpanzee forest; economic benefits; Gashaka Gumti; sustainable conservation.

1. INTRODUCTION

The benefits provided by natural ecosystems as well as national parks are both widely recognized and poorly understood. What is increasingly clear, however, is that natural ecosystems are under enormous pressure around the world from the growing demands humans place on them. Growth in human populations and prosperity translates into increased conversion of natural ecosystems, reserves as well as national parks to agricultural, industrial, or residential use, but also into increased demand for ecosystem inputs, such as fresh water, fiber, and soil fertility, as well as increased pressure on the capacity of natural ecosystems to assimilate the waste produced by us humans, including air and water pollution as well as solid waste. In short, humans are asking more and more from natural ecosystems even as humans have reduced their capacity to meet their needs [2].

One way of encouraging conservation in our society is analyzing the economic benefits/values people and the society have derived from it and those the people and the society are presently and will continue to derive in the future if conservation is continuously being practiced. We have a lot of benefits that people and some communities in and around GGNP, Nigeria have derived from conservation projects and are still deriving it presently. Among such is job creation, road construction, offering of study fellowships, drilling of boreholes, income generation through tourism, research extension and other social amenities.

Conservation can be defined as the wise use of natural resources. The oxford Advanced Dictionary (8th edition) defines conservation as the protection of the natural environment and the

act of preventing something from being lost, wasted, damaged or destroyed while the English Dictionary defines conservation as the act of preserving, guiding, or protecting; the keeping (of a thing) in a safe or entire state; preservation; it is also, the wise use of natural resources; biologically as the discipline concerned with protection of biodiversity, the environment, and natural resources; genes and associated characteristics of biological organisms that are unchanged by evolution, for example similar or identical nucleic acid sequences or proteins in different species descended from a common ancestor.

Gashaka Primate Project is one of such projects which once operated in the GGNP. One way in promoting sustainable chimpanzee conservation is the adoption of chimpanzee based ecotourism management of wild communities. Ecotourism involves traveling to relatively undisturbed natural areas for education, recreation, inspiration, and scientific purposes. The objectives may be for studying nature in the pristine state, admiring beautiful scenery, observing wild animals and plants, and/or appreciating unique geological formation, geomorphologic, or cultural site therein. Marguba [3] observed that this is the type of tourism which involved traveling to National Parks and other nature reserves for relaxation, solitude, or meditation. Odewumi [4] observed that although ecotourism is new in Nigeria, it can help to alleviate the problems of conservation and development. The Gashaka Gumti National Park is one of the sites that offer an excellent opportunity for the realization of the development of tourism objectives of Nigeria. It is the largest and most diverse conservation area in Nigeria. It is a well-known international research center, receiving visitors from all over the world and throughout the year.

The chimpanzee, the closest living relative of man, is the star of all the animals that attract people to the park. The population of chimpanzees in the park is regarded as a flagship species: high profile and charismatic species that may play a significant ecological role and often 108 have important cultural association [5], thus attracting attention all over the world. Packaging this animal for ecotourism will be of great ecological and economic benefits to the park, local community and the nation.

Conservation is linked to the process of rural development. Ecotourism can help alleviate problems of conservation and development. It can yield sustainable local earnings. In both developed and developing countries, tourism covers a wide range of economic activities because of its varied sub-sectors, such as hotels, hospitality, and transportation, which could be described as interdependent. Falade [6] observed that ecotourism is a mode of eco-development which represents a practical and effective means of attaining social and economic improvement for all countries and it is a powerful instrument for conservation of world, natural, and cultural heritage. Boo [7] stated that the idea of ecotourism is closely related and associated with conservation. He identified three opportunities in linking ecological tourism to conservation and development as thus: increase funding for the parks through tourism, provision of new jobs for local communities, and environmental education for visitors.

2. MATERIALS AND METHODS

2.1 The Study Area

2.1.1 Location

As reported by Buba [8], Gashaka Gumti National Park (GGNP) covers an area of approximately 6,700 square kilometers. It is the largest National Park in Nigeria, located in the North Eastern part of the country, and represents an area of significant national and international conservation priority. From the edge of the plateau in Taraba state, GGNP stretches northwards along the international border with Cameroon and Africa's Gulf of Guinea forests, on into Adamawa state as far as the small town of Toungo, considered a hotspot of biodiversity (Oates et al., 2004). Geographically the area lies between latitude 06°55' and 08°13' North, and between longitude 11°13' and 12°11' East (Fig. 1). Despite being located in what may be classified politically and culturally as a Northern state, in ecological terms, GGNP bears many

similarities with Nigeria's southern regions. This study was located in Kwano forest (approx. 583m²; 07°30'N-011°30'E) at the foot of the hill of Chappal Tale which is about three hours walk (11 aerial km) from the nearest village of Gashaka the Southern part of the park.

2.1.2 Topography

The park harbours extensive mountainous areas, which form part of the Eastern highlands of Nigeria. Altitude ranges from 350m to over 2,400m above sea level, which is characterized by steep slopes, deep plunging valleys, precipitous escarpments, and swiftly flowing rivers [9]. As reported by Buba [8], the highest mountain in Nigeria, Chabbal Wadde (a Fulani term meaning mountain of death), with a height of 2,647m above sea level is located in the Southeast of the Park adjoining the Nigerian-Cameroon border. The rugged terrain made commercial exploitation and road building difficult, a fact nowadays works to the advantage of the National Park's conservation efforts.

2.1.3 Climate and seasons

The Gashaka climate in general is broadly characteristic of the Guinea savanna zone. However, the climate of GGNP differs from most other central habitats because of its prolonged and marked dry season. It is not unusual to have no rain at all for up to three months (December-February). Typically, the rainy season begins in March and ends in mid-November. Rainfall ranges from 1200mm in the North to 3000mm in the South of the park [11]. The high rainfall is aided by the mountains of the area since humidity from the Atlantic is forced up into higher elevations, cools down and condenses to rain-bearing clouds. This, in turn, allows the growth of moist forests. Weather data [12] for Kwano (specific study area) from 2001-2008 reveal pronounced annual wet and dry seasons with corresponding fluctuations in temperature and humidity. The mean minimum temperature is 20.9°C, while the mean maximum is 31.9°C. Heavy downpour from mid-April to mid-November are followed by 5 months dry season with very little or no rainfall. The yearly average rainfall is 1,973mm and ranges from 1,683-2,337mm.

2.1.4 Vegetation

The combined and long-term effects of fire, farming and grazing practices have significantly altered much of the original natural vegetation of the region [13]. Now, there are seven habitat

types found within GGNP. Lowland gallery forest, riverine or riparian forest, montane forest, derived savanna, Southern and Northern guinea savanna and montane grassland. The Northern (Gumti) sector is more of woodland, characterized by tall grasses and trees with usually short boles and broad leaves. Green [14], Chapman [15] and Akinsoji [16] reported some of the commonly occurring trees species in the sector to include *Acacia spp.*, *Azelia africana*, *Khaya senegalensis*, *Daniela oliverii*, *Isober liniadoka* and *Vitellera paradoxa*. In the Southern (Gashaka) sector, moist Southern Guinea savanna predominates and the dominant tree species include: *Albizia gummifera*, *Azelia africana*, *Symphonia globulifera*, *Malletia spp.*, *Troplochiton schleroxylon* and *Aubrevillea kerstingii*. Trees are often engulfed by woody climbers that are a substantial food source for primates [17].

2.1.5 Demographic characteristics

The park is generally located in an area of low human population density. There are about 25 communities in and around the park [8]. Hogarth [18] puts the density at 52 people/ km² based on 1991 population census.

2.1.6 Land use

The tribes occupying the surrounding of the park are mostly immigrants comprising of

Dekka, Ndoro, Kaka, and Chamba. Most of them are pastoralists found in the grazing enclaves of Filinga, Mayo Sebere, Chappal Tale, Chappal Hendu, Chappal Shingu and Nyumti. In addition, they also practice subsistence farming. Crops grown include cassava, Guinea corn, maize and cowpea [13]. Fishing is practiced in the major rivers such as the Kam, Yim, Gashaka, Gam-gam and Taraba. Another important land use in the area is wildlife conservation [9].

2.2 Data Collection

Data collected on the benefits derived from conservation activities and suggestive strategies on conservation improvement (especially in the chimpanzee forest habitat Kwano) was collected through Purposeful or Judgmental Sampling by standardized face-to-face interviews scheduled according to Ezebilo et al. [1] by the help of questionnaire. The Park staff and Gashaka village dwellers were used since it is the closest settlement to this forest. The Fulani language was used in interviewing the people as most of them understood it better than other languages. The interview was conducted based on age range from 20 years and above because people within these age ranges have more experience with the chimpanzee forest habitat. The interviewees were educated on the study by the researcher before being interviewed.

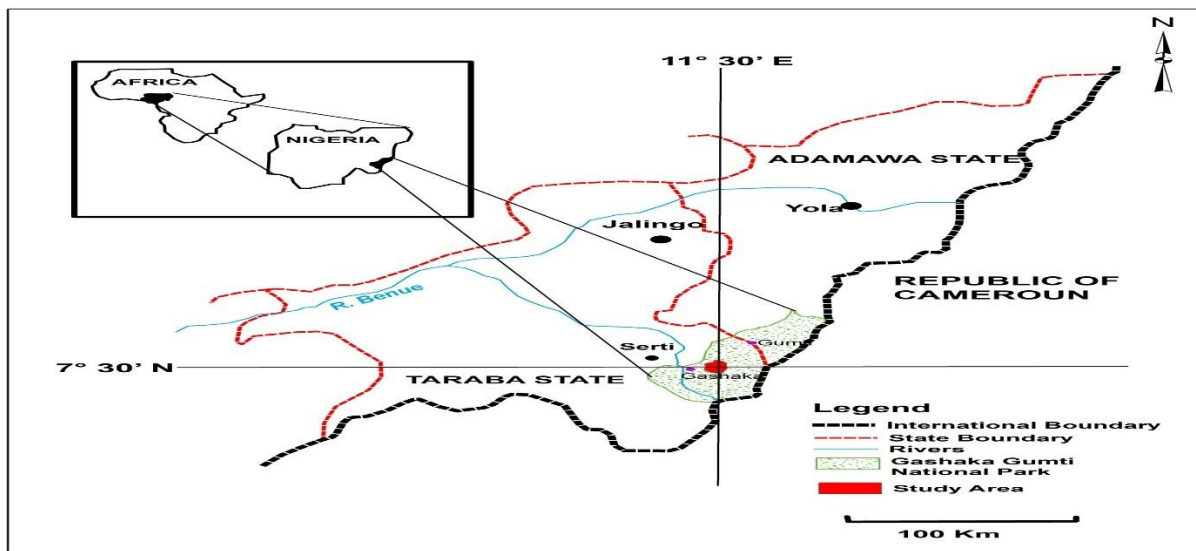


Fig. 1. Map showing Kwano forest in Gashaka Gumti National Park

Source: Warren [10]

Table 1. Respondent’s distribution base on Cochran [19]

Name of community	Estimated population of community	Number of respondents interviewed in each community
Gashaka village	350	34
GGNP staff	271	26
Total	621	60

Source: Field Survey (2016)

2.3 Sampling and Sample Size

A total number of 34 respondents were interviewed in Gashaka village and 26 respondents among the Park Staff. The number of respondents interviewed from the Gashaka population and the park staff (Table 1) was based on the proportional allocations techniques by Cochran [19]. The formula is stated as:

$$nh = Nh \times \frac{n}{N} \quad (1)$$

Where,

nh= Number of respondents that was to be interviewed

n= Total number of sampled respondents

Nh= Estimated population of human community

N= Total population of all the human communities

3. RESULTS

3.1 Socio-Economic Characteristics of Gashaka Village and Park Staff

3.1.1 Gender distribution of respondents

Majority of the respondents among Gashaka indigenes were males (67.65%), while females were fewer (32.35%). The same situation was the case with the Park staff; only 15.38% out of the 26 were females while 84.62% were males indicating that only few of the Gashaka females responded to the interview while very few of the Park staff were females.

3.1.2 Educational level of the respondents

Among the respondents in Gashaka village none attended tertiary education, 17.65% attended secondary education, 67.65% attended only primary education and 14.71% had no formal education while for the park staff, 46.15% attended tertiary institution and 53.85% had secondary education.

3.1.3 Age distribution of respondents

The modal classes age distribution were 26-30 and 41-45 (14.71%) each with a frequency of 5 and the mean 44 ± 1.89 , while 31-35 (23.33%) with a frequency of 7 with the mean of 39 ± 1.57 for Gashaka village and Park staff respectively.

3.1.4 Occupation of respondents

The occupational distribution revealed that the Park management staff were all civil Servants, while for the Gashaka indigenes majority (52.94%) were farmers, 17.65% were field assistants, 11.76% each were housewives and transporters, 5.88% were civil servants.

3.1.5 Marital status of respondents in Gashaka village and park staff

The distribution of respondents by marital status indicated that 88.24% of them in Gashaka community were married whereas 11.76% were still single while for the park staff, 92.31% were married whereas 7.69% were not married.

3.1.6 Household size

The household size range 4-6 had highest frequency (58.82%) and 7-9 range was the least (11.54%). The mean was 4 ± 0.14 for Gashaka village and 4 ± 0.18 for Park Staff.

3.1.7 Respondents’ acquaintance with Kwano forest

Majority (84.62%) Park management staff have been to Kwano forest compared to 15.38% who claimed to have never been to Kwano forest. All the respondents from Gashaka village claimed to have been to Kwano forest.

3.1.8 Benefits derived by Gashaka community

3.1.8.1 Improvement of livelihood

A large proportion of the respondents (79.41%) in Gashaka village claimed that participants in

conservation activities patronize their businesses, thus increasing their income. The businesses range from sales of provision to farm produce. Most of the respondents (61.76%) in Gashaka village, especially the youths who gained employment from conservation projects, claimed to have benefited in cash gifts from conservation projects, tourists and researchers. 26.47% of the respondents asserted to gained employment, both as casual and permanent basis (such as Rangers with GGNP, Field Assistants to Gashaka Biodiversity Project and other research groups). The road from Serti to Gashaka village was constructed to aid conservation projects and so many of the youths were engaged in one form of job or the other. Some other benefits include; clothes, free entrepreneurship training, food items etc. incentives the respondents claimed to have benefited from conservation projects. About 35.29% of them indicated educational gain, which included sponsorship to attain various categories of education, provision of educational facilities such as benches and construction of classroom blocks etc.

3.1.8.2 Social amenities-health, education, road construction

Respondents (76.47%) claimed to be benefiting from conservation activities by accessing free medical services by the conservation projects and the distribution of treated mosquito nets.

The indigenes of Gashaka village became exposed through their interaction with tourists, researchers, as well as students who do visit the conservation area.

Education was one of the Benefits Derived from Conservation Activities. Other benefits included the construction of roads as claimed by respondents (64.71%) linking Gashaka village with Serti town and Gashaka village with Kwano.

3.1.9 Benefits derived by park staff

3.1.9.1 Improvement of livelihood

All the respondents (100%) claimed that youths have gain employment from conservation projects both casual and permanent (such as Rangers with GGNP, Field Assistants to Gashaka Biodiversity Project and other research groups). A proportion of the respondents among the Park staff (30.77%) who engaged in other businesses claimed that participants in conservation activities patronize their

businesses, thus increasing their income. The businesses ranging from sales of provisions to farm produce. Some of the respondents (15.38%) of the Park Staff claimed to have received cash benefits from conservation projects as well as tourists and researchers.

3.2 Social Amenities-Health, Education, Road Construction

The majority of the respondents (61.54%) claimed to have benefited from conservation by accessing free medical services by the Park management and conservation projects and the distribution of treated mosquito nets.

Education was one of the incentives the respondents claimed to have benefited from conservation projects. About 38.46% of them indicated to have educational gain, which include sponsorship to attain various categories of education, provision of educational facilities such as benches and construction of classroom blocks, provision of stationaries for their children, etc.

The road from Serti to Gashaka village was constructed to facilitate the implementation of conservation projects and so 46.15% respondents claimed that the road had brought a lot of benefits to the Park staff as well as the Gashaka indigenes.

Some other benefits include: clothes, free entrepreneurship training, food items etc.

3.2.1 Monthly income generation of Gashaka village and park staff

Fig. 2 shows the estimated amounts of money to have gained as a result of conservation projects with respect to the various months of the year as given by the respondents. The highest amount of money gained (₦45,000) was in February, ₦44,000 in March, and ₦41,000 in April. The mean income was ₦35,333±7,090.68 for Gashaka community and ₦22,083±5,545.18 for Park Staff.

3.3 Strategies for Conservation Activities Suggested by Respondents

3.3.1 Strategies for conservation suggested by Gashaka indigenes

The respondents of Gashaka village based on their experience suggested conservation strategies in the chimpanzee forest habitat Kwano as well as the entire Park. Gashaka

indigenes (85.29%) suggested that more employment opportunities should be offered to the indigenous communities within and around the conservation site with more preference to the youths; 79.41% also suggested that conservators should collaborate with traditional rulers/community leaders during the planning and implementation of conservation projects; (70.59%) suggested that staff salaries and welfares should be improved, and should be paid as at when due as an incentive to the staff. Increasing the number of Rangers was also suggested by 67.65% of the respondents, so as to intensify surveillance in the Park as a strategy for conservation. Effective anti-poaching equipment should be acquired for Rangers to make their operations easier. The road linking Gashaka village and Serti town and Gashaka village and Kwano should be rehabilitated to ease movement of equipment and personnel. The canoes on the rivers into the Park should be serviced while canoe men should be properly trained. The road network linking the enclaves and the neighbouring communities should be improved upon. Suggestions were also made from 64.71% of the respondents that facilities meant to sustain tourists, researchers and students such as accommodation, transport, and health should be worked upon. Suggestions came from 55.88% of the respondents that conservation projects should offer more opportunities for the existing casual workers to be made permanent. Enlightenment campaign on conservation practices should be a routine programme of the park management was suggested by 50% of the respondents. About 35.29% of the respondents suggested that grazers, poachers as well as other offenders caught within the conservation area or the buffer zones should be charged at the court of law and charges against offenders should be reviewed upward to serve as deterrent to prospective offenders.

3.3.2 Strategies for conservation suggested by park staff

The respondents among the Park staff based on their experience suggested conservation strategies in the chimpanzee forest habitat Kwano as well as the entire Park. All the Park staff respondents suggested that conservators should collaborate with traditional rulers/community leaders during the planning and implementation of conservation projects; more employment opportunities should be offered to the indigenous communities within and around the conservation site with more preference to the

youths; and staff salaries and welfares should be improved, and should be paid as at when due to avoid discouragement on the side of the staff. All respondents also suggested that grazers, poachers as well as other offenders caught within the conservation area or the buffer zones should be charged at the court of law and charges against offenders should be reviewed upward to serve as deterrent to prospective offenders. Suggestions came from 92.31% of the respondents that effective equipment should be acquired for Rangers to ease anti-poaching patrols. Suggestions from 88.46% of the respondents was that existing casual workers be made permanent and same percentage of respondents suggested that enlightenment campaign on conservation practices should be a routine programme of the Park management to keep the local people current on recent activities. Suggestion was made by 80.77% of the respondents that facilities meant to sustain tourists, researchers and students such as accommodation, transport, and health should be worked upon. Suggestion came from 76.92% of the respondents that the number of Rangers within Filinga Range and other ranges was suggested to be increased with more barracks established to intensify surveillance in the Park as a strategy for conservation.

4. DISCUSSION

Majority of the respondents from Gashaka community were males compared to females. This could be because of the people's cultures which do not allow women to interact with men particularly strangers. Women are always indoors and mostly the men are the ones to attend to guests. As for the park staff, there were more males than females due to the fact that only a very small percentage of the entire population of the Park Staff is made up of females. None of the respondents from Gashaka village ever attended any tertiary institution which implies that most of the indigenes can hardly get white kola jobs with such qualifications and so will need empowerment skills to keep them away from poaching activities. The majority of the respondents were of the younger age classes. These observations are in same pattern of age, education, occupation, business reported by Yaduma [20], though it disagrees on gender pattern. This could be as a result of Gashaka villagers becoming more exposed through increasing interactions with tourists, researchers, students and even park staff who visit the conserved area for one thing or the other.

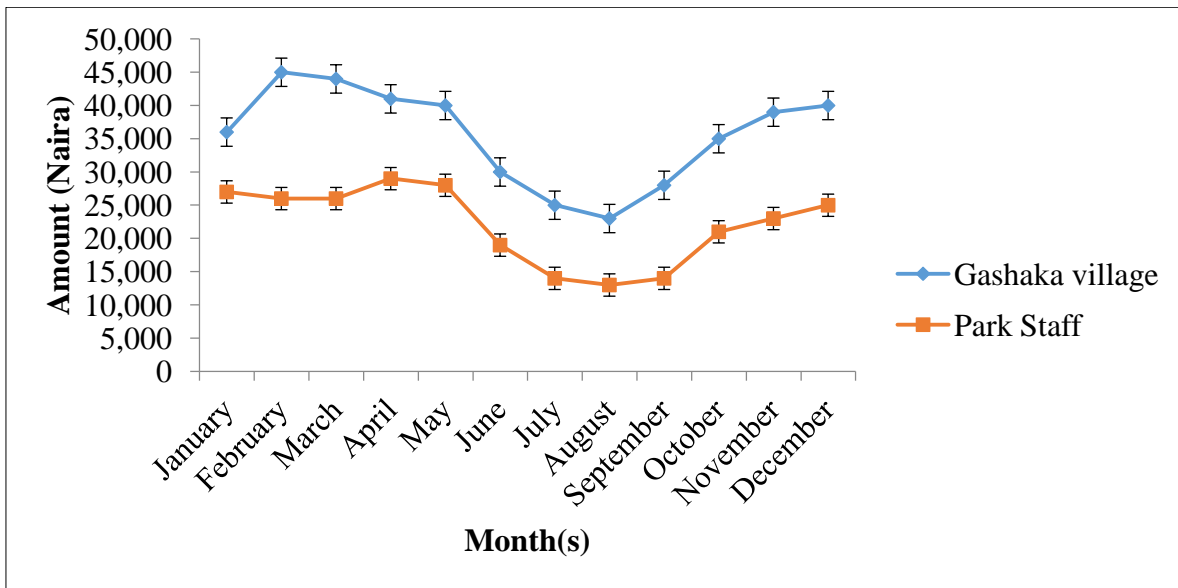


Fig. 2. Monthly cash income of Gashaka villagers and park staff

Mean cash income for Gashaka community= ₦35,333±7,090.68; Park Staff= ₦22,083±5,545.18

The household sizes and occupation of the Gashaka villagers implies that more land or forest will be needed to be converted to farmland which is detrimental to chimpanzee forest habitat and conservation in general if not properly managed even though a good number of benefits gotten from conservation activities was listed by the villagers. The villagers have been opportune to see vehicles reach their village and even beyond to Kwano because of conservation activities, with this, the villagers are very much encouraged to participate in conservation activities so as to enjoy many more of such benefits. Responses gotten from the villagers indicate that they strongly desire conservation activities in their area even some complained of wild animals destroying their crops.

The highest amount of money gained in cash because of conservation activities were in February, March and April and the least in August, September and July. These months of high income generation coincides with high conservation activities, tourist visits, research works and low farming activities. These keeps the farmers earning income instead of staying idle or getting involved in anti-conservation works like wood cutting or poaching. The results showed that low income is being earned by during the rainy seasons which could be as a result of inaccessibility of the roads to the chimpanzee forest habitat during the rainy seasons. There are at least four (4) fast flowing rivers to cross on canoes during the rainy

seasons before getting to the chimpanzee forest habitat Kwano from Serti town which is a big constraint to researchers, tourists and students. Lockwood [21] reported that compensation for restoration of human welfare should be considered among the principles for good protected area governance to account for fair distribution of costs and benefits and Hill [22] and McElwee [23] reported that unfortunately, socio-economic relationships are not always recognized by protected area managers due to lack of local knowledge, attention and understanding while Sarka and Montoya [24] said although knowledge of the socio-economic aspect is crucial to fostering a suitable context for conservation, including damage prevention and compensation.

Currently Non-Governmental Organizations involved in conservation activities in this chimpanzee forest habitat is the Africa Nature Investors (ANI) who took over from Gashaka Biodiversity Project (GBP) led by Chester ZOO England which succeeded the Gashaka Primate Project (GPP). This project has engaged six (6) people as Field Assistants from Gashaka Village. GGNP has also employed some indigenes of the village Gashaka into her work force too. If the Nigerian National Park Service could take proactive measures on the suggested strategies, it can be of great help to improve upon conservation not only in GGNP but in Nigerian protected areas as a whole. Suggestions made by the respondents indicates that conservators

should liaise with traditional rulers and community leaders in order to carry out an effective conservation. Improved welfare packages for the staff of the Park staff was suggested a good number of the respondents which go a long way to boost the morale of the workers while others were of the opinion that more youths should be employed in order to increase upon the number of Rangers working with the park most especially the Filinga range which is vast with a very rough topography which agrees with Sheer [25], who suggested that National Park Service should give priority of employment to able bodied and qualified men and women from immediate host communities of the National Parks right from inception. This implies that the number of poachers will arguably be reduced as some of them will be engaged into protecting the Park instead of destroying it.

Sensitization should be considered as a serious priority as it was suggested by most of the respondents. This corroborates Tabuti et al., [26] who reported that community sensitization and empowerment can improve conservation activities. Federal Republic of Nigeria [FRN], [27] reported that awareness creation and continuous training, resettlement program, creating opportunities for alternative means of livelihood and promoting Non-Governmental Organizations effort to involve in land rehabilitation practices can help solve the problem encountering land degradation problem in Nigeria. Increasing charges against grazers, poachers and other offenders caught within the Park was suggested by a least number of the respondents from Gashaka village. Fowler (2006) supported this idea, when he suggested disparaged alternative to the community-based, incentive-driven approach to nature conservation is the stricter enforcement of existing laws and a fortress-based approach to protected areas. This implies that the people of Gashaka should be aware of those tress passing in the conserved area, and become whistle blowers as only a few percentage of them suggested that there should be an increased charge on grazers, poachers and other offenders caught within the park.

Conservation with the involvement of local communities is therefore very important. Some respondents were of the opinion that adequate anti-poaching materials such as weapons, radios, vehicles, etc should be provided to Rangers while others suggested that improving facilities for tourists, researchers and students such as accommodation, transport, health could

attract more of them to the cites, not only that Non-Governmental Organizations (NGOs) will float the area with various projects, when they know that the facilities there are first class. Akosim et al., [28] stressed the need to integrate conservation with regional development to actively promote the linkage between National Parks and appropriate sustainable development. If all the suggested strategies are taken into consideration, it will go a long way to intensify conservation of the chimpanzee forest habitat in Kwano thereby increasing more income for the local communities through employment, business and so on. These suggestions were in agreement with Marguba [3] who reported that in Lake Chad Basin National Park, Park community consultative committees are formed in the three emirates with the Emir as the Chairman. None of the respondents suggested food taboo, beliefs as a strategy though it could also go a long way to improve upon conservation activities which Godson [29] and Castrol [30] also reported that the strength of the traditional roles and laws enshrined in the taboos, beliefs, etc. which in the past served as very effective tools in the conservation of biodiversity have thus substantially eroded with time from the minds and culture of people resulting in the encroachment and degradation of the once well-guarded grooves, ecologically sensitive and other protected areas as well as Forestry Association of Nigeria [FAN] [31] noted that social and supernatural sanctions have been important in preserving sacred grooves and trees with local mystical significance even in areas undergoing considerable changes in region and culture [32,33].

5. CONCLUSION

The conservation activities at Kwano Chimpanzee forest habitat in Gashaka Gumti National Park (GGNP), Nigeria has benefited both the local people of Gashaka and Park Staff especially in education, employment, health facilities, income generation, and access roads.

Expanding the man power of the Park with preference to youths within the enclaves and buffer zone communities, improve staff welfare, offer of more study fellowship to indigenes from communities within and around the conserved areas will be a good strategy towards achieving conservation of the park's biodiversity. The Park management should cooperate with the traditional rulers/leaders of the host communities and those around the conserved areas. Regular

sensitization of communities within and around the park should be intensified in order to improve on conservation activities within the park and Nigeria at large. Conservation education department of the park should carry out more sanitization programs to schools, churches, mosques, local markets as well as community organizations to enlighten the local masses on the benefits of conservation activities around their communities.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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