Initiation Success of the Conservation Component of Community-Based Natural Resource Management in the Okavango, Northern Botswana

Gaseitsiwe Smollie Masunga [*] ***and Koodirile Girlie Thebe*** [♣]

Abstract

Community-Based Natural Resource Management (CBNRM) is a bottom-up approach that is widely practiced in developing countries because of its promise to promote sustainable conservation, empowerment, and generation of economic benefits for local communities. However, there are concerns that the CBNRM communities focus more on resource exploitation for short term financial benefits than investing in sustainable conservation. This study evaluates the undertaking of the conservation component of CBNRM in Sankuyo and Khwai communities in Okavango, northern Botswana, between 2008 and 2013 following the introduction of the national CBNRM policy. It further examines community perceptions on the effectiveness of the CBNRM programme in facilitating rural development and biodiversity conservation. The study was carried out before the hunting ban of 2014-2019 came into effect. We found that during the five-year period when the area management plans were in operation, the Sankuyo community initiated 86% (6/7) and Khwai community initiated 71% (5/7) of the conservation projects they had planned to undertake under CBNRM. Most of the respondents in the two communities were satisfied with the proportion and importance of the initiated projects on conservation. The projects were reported to have reduced wildlife poaching, illegal safaris, and unlicensed harvesting of thatching grass. Despite the high initiation of the conservation projects the respondents, nonetheless, believed that the CBNRM was primarily introduced to drive rural development and generate benefits for the community than for conservation. However, the high initiation of the conservation projects by Sankuyo and Khwai communities demonstrates their recognition of conservation as an integral part of the CBNRM that also needs attention for the long-term sustainability of the CBNRM.

Keywords: Conservation project; CBNRM; community participation; management plan; Okavango Delta; project implementation; rural development.

Introduction

The CBNRM is a bottom-up approach that is currently being practiced widely to motivate local communities to conserve natural resources and benefit socio-economically from their efforts (Kellert *et al*., 2000; Mbaiwa 2004; Bond *et al*., 2006; Gruber 2010; Lenao and Saarinen 2016; Cooney *et al*., 2017). The approach has been in existence for several decades (Dressler *et al*., 2010). In the 1970s it was practiced in West Africa and was referred to as Community Natural Resource Management (CNRM) (Kellert 2000), and in the 1980s it was introduced in Zimbabwe as Wildlife Industries New Development for All (WINDFALL) and later renamed Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) (Child 2003 and Bond *et al*., 2006). The CBNRM concept is based on the theory that if communities are granted ownership rights and decision-making powers over a resource and are able to benefit from it, then they will value, manage and use the resource sustainably (Ostrom 1990; Arntzen *et al.,* 2003; Mbaiwa 2004; Thakadu 2005). The CBNRM has three key components; namely i) *conservation* (nature and environmental management); ii) *empowerment* (power, authority, autonomy, good governance, and rural development); and iii) *benefit* (revenue generation, benefit, wealth, and economic development)

[*] Gaseitsiwe Masunga, Okavango Research Institute, University of Botswana. Email: gsmasunga@ub.ac.bw

[♣] Koodirile Girlie Thebe, Okavango Research Institute, University of Botswana. Email: thebegirlie@gmail.com

(Murphree 2009; Anderson and Mehta 2013; Lenao and Saarinen 2016). It has been widely implemented in developing countries, mostly in Africa and Asia (Child 2003; Cooney *et al*., 2017; Lenao and Saarinen 2016). However, there are concerns that little attention has been given to the conservation component (Kellert 2000 and Pert *et al*., 2010), hence, jeopardising the sustainability of the CBNRM (Anderson and Mehta 2013; Mbaiwa and Kolawole 2013). This study, therefore, sets out to determine the type and proportion of conservation-oriented projects initiated by the CBNRM communities in Botswana and community perceptions on the importance of the conservation projects and the CBNRM programme in general in advancing rural development, benefits, and resource conservation.

The CBNRM programme can only be considered a success in its entirety if all its three key components have been considered in the implementation process (Anderson and Mehta 2013). Recent literature is inundated with success stories of the CBNRM, but these stories are mainly on the income generation and governance (Mbaiwa 2005; Mogende and Kolawole 2016; Mogomotsi *et al*., 2020), which should be celebrated, nonetheless, because improved socio-economic benefits and good governance would keep poverty at bay and motivate local communities to support calls for conservation (Abensperg-Traun 2009). Once the communities are socio-economically empowered, they are bound to utilise their knowledge, skills, and decision-making powers to initiate sound conservation projects without having to worry much about hunger and means to execute the projects. Conservation is generally defined as the sustainable use of a natural resource, and sustainability in this context, refers to giving the resource a necessary protection so that it continues to exist and used in its natural or desired biological form for the benefit of the current and future generations (Abensperg-Traun 2009).

For local communities living in biodiversity-rich areas, conserving biodiversity would ensure a continuous supply of ecosystem services and improved livelihoods for them (Abensperg-Traun 2009; Suich *et al*., 2012). The increasing loss of biodiversity at both local and global scale is a matter of great concern that can only be effectively halted if all key stakeholders are engaged in planning and implementation of the action plans, and subsequently empowered to benefit from their conservation efforts (Stuart *et al*., 1990 and Butchart *et al*., 2010). There is a general belief now that since local communities live side by side with natural resources they are likely to know better the causes of and solutions to reversing biodiversity loss (Mbaiwa 2004 and Cooney *et al*., 2017). In Botswana, the CBNRM was introduced in the late 1980s. By 1995 many Southern African countries such as Botswana, Namibia, Zimbabwe, and Zambia, had already introduced the programme although variations in the name of the programme existed between the countries (Rihoy 1995). In Botswana, Namibia and Zimbabwe the CBNRM is largely wildlife-based and is practised in wildlife management areas or conservancies bordering wildlife national parks and reserves (Jones and Weaver 2009; Rozemeijer 2009 and Taylor 2009). The CBNRM programme has been successful partly because of the abundance and diversity of free-ranging wildlife species common in this tropical semi-arid region, which include the 'big five' animals'. The big five animals are elephant (*Loxondonta africana*), buffalo (*Syncerus caffer*), white/black rhinoceros (*Cerototherium simum simum/Diceros bicornis*), lion (*Panthera leo*) and leopard (*Panthera pardus*) and most tourists to Southern Africa come to see or hunt these animals (Caro and Riggio 2014; Winterbach *et al*., 2015).

To fully implement the three key components of CBNRM, in 2007 the government of Botswana introduced the National CBNRM Policy to demonstrate its commitment to the programme and to address challenges impeding the balanced implementation of the three components (Republic of Botswana 2007)). The policy proposed that part of the 65% of the annual profit generated from CBNRM activities such as hunting and photographic tourism should be deposited into the National Environmental Fund to be used to support environmental and biodiversity conservation projects as well as emerging CBNRM programmes countrywide. The remaining 35% would be exclusively used to meet the recurrent costs of the community-based organisation (Republic of Botswana 2007). Again in Botswana, communities living in or near

protected areas and desiring to practice CBNRM are allocated a tourism concession area to manage and generate benefits from it within a specified period of time, called the lease period (Fabricius *et al*., 2013). The tourism concession area can be 6 000-350 000ha in area, and is often leased to a CBNRM organised community for three renewable periods of five years each, with the end of each period subjected to evaluation by the government for compliance with the conditions of the lease agreement (Thakadu 2005).

Communities are then required to develop or adopt a five-year management plan that guides them in planning, zoning, use of resources, revenue generation and biodiversity conservation (Rozemeijer 2009). Stipulated in the management plan also would be a detailed set of agreed standards, parameters and time schedules upon which communities are expected to base their projects, and upon which they would also be evaluated by the government at the end of the lease period. The projects proposed and executed by the CBNRM communities should be aligned to the three key components of the CBNRM and prioritised in the management plan for implementation (Suich *et al*., 2012). If local communities lack the technical and financial capacity to implement the CBNRM projects, they can sub-lease the area to a private business partner, commonly known as a joint venture partner, who can use the area for five years and implement projects listed in the management plan on behalf of the community (Thakadu 2005; Lepper and Goebel 2010).

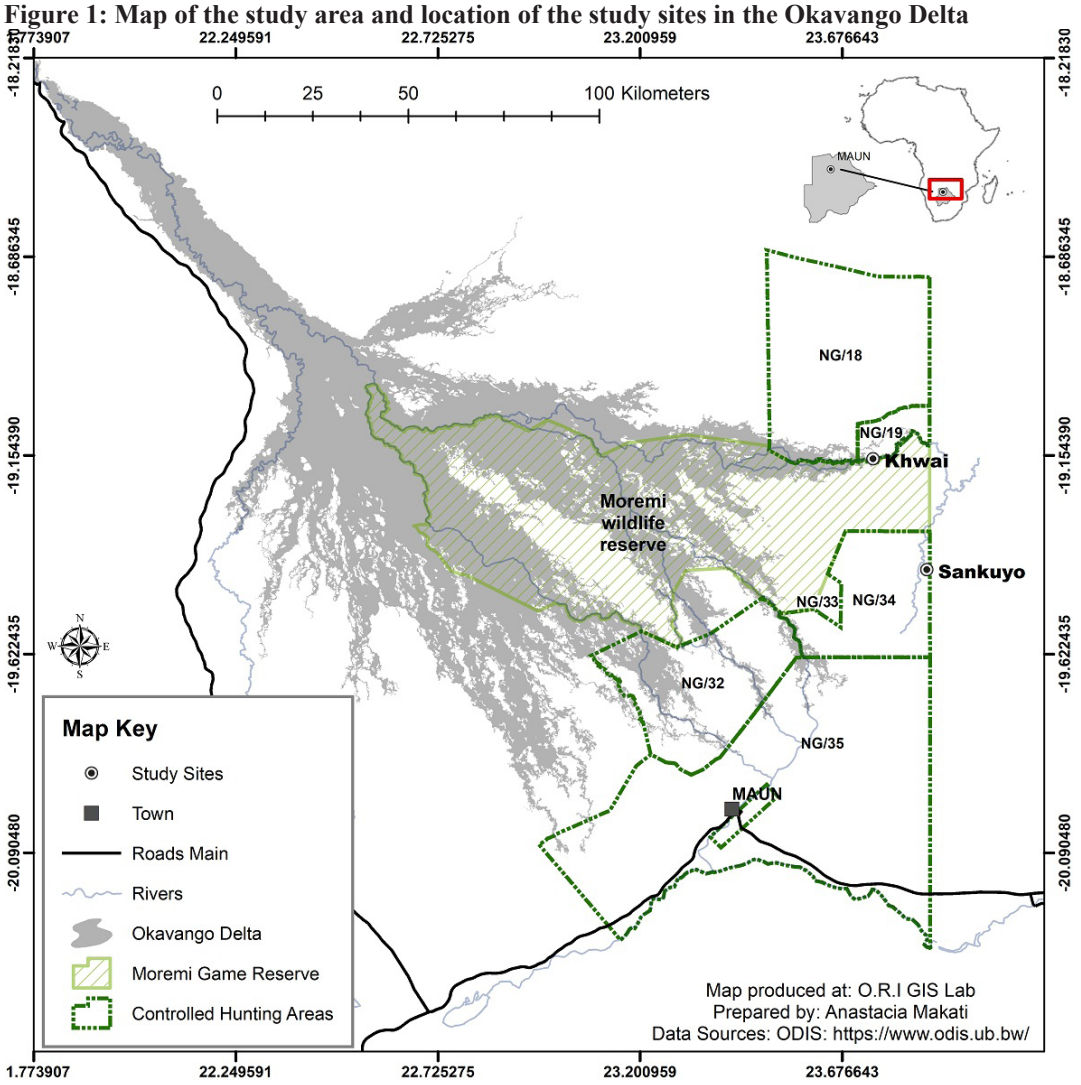
The aim of this study was to establish the type and proportion of conservation-focused projects that the two CBNRM communities in northern Botswana undertook between 2008 and 2014. It also further examined the perceptions of the two communities on challenges affecting the initiation of the projects as well as their perceptions on the importance of the CBNRM on rural development and conservation. The focus of this study was on Sankuyo and Khwai communities which had at least 20 years of experience in the CBNRM programme and were reported several times as success stories of the CBNRM in Botswana from the economic and governance perspective (Kgathi and Ngwenya 2005; Mbaiwa and Stronza 2010).

Methods and Materials

Study area

The study was conducted in Khwai and Sankuyo villages located in wildlife management areas surrounding Moremi Game Reserve in the Okavango Delta (Figure 1). A wildlife management area (WMA) is a partially protected area around a fully protected area such as a national park or a game reserve and it serves as a buffer between a fully protected area and human inhabited areas. The Khwai and Sankuyo communities were selected for this study based on their long experience and success in managing the CBNRM projects. The Khwai community practiced CBNRM in wildlife management areas NG18 and NG19, while the Sankuyo community practiced it in NG33 and NG34. The Khwai and Sankuyo communities were relatively small at the time of study, with 56 and 76 households, respectively (Mbaiwa and Stronza 2011). Local communities in the Okavango Delta generally earn their living from subsistence farming, hunting, and gathering, fishing, and sale of crafts, local foods, and baskets (Motsholapheko *et al*., 2011).

Figure 1: Map of the study area and location of the study sites in the Okavango Delta



Source: Okavango Research Institute (ORI) GIS Laboratory

Data collection

The survey was carried out in July 2013. The study adopted a mixed method approach where qualitative and quantitative data were generated and analyzed. Given the low number of households and low occupancy rate of homes in Khwai and Sankuyo at the time face-to-face household interviews were undertaken in all the households. Those interviewed were the heads of households or their representatives aged 18 years or above. Interviews were conducted in 30 households in Khwai and 40 households in Sankuyo, using a semi-structured questionnaire. The questionnaire had closed and open-ended questions and used Likert Scale in some questions to enable collection of both quantitative and qualitative data. The supplemental qualitative data was obtained through use of key informants.

To improve on the sample size, we made numerous revisits to homes that were not occupied during the first visit, but the effort was abandoned after two weeks for households that remained unoccupied. The low occupancy rate of the homes in the villages of Khwai and Sankuyo was caused by some families which work and stay in Maun town which is located 95-140 km away (Mbaiwa and Stronza 2010), and only return to the villages on weekends, month-end or when there are some social responsibilities to fulfil. The Khwai and Sankuyo villages are located on the peripheries of Moremi Game Reserve within the Okavango

Delta but are economically impoverished by the intense human-wildlife conflict, poor road conditions and their remoteness from centres of economic activities. As a result, the residents periodically move out of their settlements to nearby urban centres to seek alternative and viable sources of livelihoods such as employment and markets for their goods and services. To verify qualitative and quantitative data from the household questionnaire interviews and area management plans, we further conducted face-to-face key-informant interviews on six senior officials purposively selected from key institutions that are directly responsible for the implementation of CBNRM in the area.

This mixed-methods approach facilitated methodological and data triangulation which enabled validation of responses or data from different sources on the same topic (Heale and Forbes 2013). Key informants comprised an executive board member of the CBNRM implementation committee in each community, a CBNRM programme manager from each community, a senior government officer in the Department of Wildlife and National Parks (DWNP), and another one in the Department of Forestry and Range Resources. These two government departments are responsible for wildlife and forest resource conservation in the country, including the study area. All interviews were conducted in the national language (*Setswana*) which is widely spoken in Botswana and well understood in Khwai and Sankuyo (Mbaiwa 2004). The local languages are the Bugakhwe of the San origin (Basarwa) and the Yei of the Wayeyi tribe, respectively. All ethical considerations including seeking consent from the respondents to be interviewed, assuring them of privacy and confidentiality, and freedom to withdraw from the survey were communicated with the respondents.

The area management plans for Khwai and Sankuyo community that had completed or were about to complete the lease period of five years were reviewed to determine the type and number of conservation-oriented projects that the communities had planned to undertake in their areas. For Khwai, the 2010-2014 management plan was reviewed. Although the management plan had one-year left before its validity period ended, previous management plans were not archived, hence unavailable for this study (Khwai Development Trust 2010). For Sankuyo, the management plan of 2008-2012 had completed its lease validity period and was used for this study (Sankuyo Tshwaragano Conservation Trust 2008).

Data analysis

Frequencies and clustered bar graphs, chi-square and significant level values were obtained through crosstabulation of the categorical variables in the Statistical Package for Social Sciences (IBM SPSS Statistics 12). A binary logistic regression (using a backward stepwise-conditional option) was further run to determine the significance of the demographic factors on the contribution of the CBNRM to economic benefits, rural development and conservation. Mulivariate analysis was also used to determine relationships between variables (e.g. information sharing methods). The means were considered significantly different when $p < 0.05$.

Results

Demography

Thirty heads of households and their representatives (19 male and 11 female) in Khwai, and 40 (21 male and 19 female) in Sankuyo were interviewed. A larger number of respondents (53.3%) in Khwai were of 36-55 years of age, followed by 18-35 years (33.3%) and lastly of 56 years and above (13.4%). In Sankuyo, the dominant age group was of 18-35 years old (60%), followed by 36-55 years (27.5%) and lastly of 56 years and above (12.5%).

In terms of education, Sankuyo had a larger number of respondents who had attained primary education and above (70%) compared to Khwai which had 53.3% of respondents that attained that level of education. Most of the respondents (72.5%) in Sankuyo were employed, mainly in social welfare and

CBNRM programmes, while in Khwai only 40% were employed in the same areas. *Bugakhwe* ethnic group of the San (Basarwa) origin was dominant in Khwai and constituted 80% of the respondents, whereas in Sankuyo the *Wayeyi* were dominant and constituted 87% of those that responded.

Initiated conservation projects

Khwai and Sankuyo communities had seven conservation-focused projects each, which were to be undertaken within the five-year lease period of their respective management plans (Table 1). Out of these seven projects, Khwai community initiated five of them and Sankuyo initiated six, indicating an initiation level of 71% and 86%, respectively. The initiation level in this study was defined as the number of projects initiated over the total number of projects that were planned to be done and completed within the five-year lease period of the management plan of each community. Two projects that Khwai community did not implement were i) the development of artificial waterholes to provide surface water to wildlife, and ii) undertaking of trophy hunting, which is the commercial hunting of wildlife.

Table 1: Conservation-focused projects that were planned and implemented by the CBNRM communities of Khwai and Sankuyo in northern Botswana during the 5-year lease periods of their concession areas

No.	Project Name	Was the project implemented? (√= Yes; X = No)	
		Khwai	**Sankuyo**
	Engage escort guides in wildlife census	√	√
	Develop artificial water points for wildlife	X	X
	Establish firebreaks	√	√
	Undertake regular anti-poaching patrols	√	√
	Participate in trophy hunting	X	√
	Operate photographic tourism	√	√
	Regulate harvesting of wild products	√	√

Source: (Sankuyo Tshwaragano Community Trust 2008; Khwai Development Trust 2010 and Survey Data 2013).

Household interviews revealed that 50% of the respondents in Khwai were aware of the plan to develop artificial waterholes (Table 2). The respondents attributed the failure to develop the waterholes to the abundance of surface water in the Khwai River and nearby floodplains. The river and the floodplains had been flooded since 2009. The perception held by the community for the uninitiated waterhole project was corroborated by the CBNRM programme manager in Khwai who explained that since surface water was plentiful in the area because of the floods, the CBNRM board members found it justifiable at the time to defer the waterhole project. The manager further reported that although safari trophy hunting was done in one of their concession areas prior to 2009, hunting was never initiated in the area during the lease period of 2010-2014. The reason for not initiating any hunting was because the Botswana government had already alerted them of its intention to phase out wildlife hunting in favour of photographic tourism in Botswana effective from 2014. Therefore, the phasing out of hunting started with the Khwai community in 2010.In Sankuyo, the only project that was not initiated was the artificial waterhole project.

About 60% of the respondents were aware of this project and had a similar explanation as the respondents in Khwai on the delay in implementing the project. They believed that the abundance of surface water in the nearby Okavango Delta floodplains made the project unnecessary. The CBNRM programme manager in Sankuyo clarified that boreholes were dug in their area during the previous lease period, and

the only task to be undertaken in the 2008-2012 plan was to equip the boreholes and build drinking troughs for wildlife. However, the initiation of the project during the 2008-2012 lease period was deferred because of the huge floods of 2009 that sufficiently covered the nearby floodplains and natural pools. Surface water was enough to support wildlife for extended period.

Table 2: Awareness of the Khwai and Sankuyo communities on conservation projects to be initiated through CBNRM between 2008-2013*

Project	Khwai		Sankuyo	
	Yes	No	Yes	No
1. Escort guide	30 (100%)	0 (0%)	40 (100)	0 (0%)
2. Artificial water-points for wildlife	15 (50%)	15 (50%)	23 (57.5%)	17 (42.5%)
3. Establish firebreaks	22 (73.3%)	8 (26.7%)	33 (82.5%)	7 (17.5%)
4. Anti-poaching patrols	29 (96.7%)	1 (3.3%)	24 (60%)	16 (40%)
5. Trophy hunting	18 (60%)	12 (40%)	40 (100%)	0 (0%)
6. Photographic tourism	29 (96.5%)	1 (3.5%)	39 (97.5%)	1 (2.5%)
7. Harvesting of wild products	30 (100%)	0 (0%)	100%	0 (0%)

*This was a response to a question: 'Are you aware that this project is planned to be initiated in the current management plan?'

Source: Survey Data 2013

Importance of initiated projects

Monitoring of trophy hunting by community escort guides was stated as important in resource conservation by 90% of the respondents in Khwai and 85% in Sankuyo. During trophy hunting community escort guides accompany trophy or sport hunters in their expeditions to ensure compliance to hunting license regulations. The respondents explained that taking part in hunting expeditions had contributed to reductions in illegal harvesting of natural resources in their community areas. Community escort guides were also responsible for undertaking anti-poaching patrols in their community areas. These patrols were reported to have been undertaken and effective in reducing poaching in the area as reported by 67% of the respondents in Khwai and by 90% in Sankuyo. The response significantly differed between the two communities (Chi-square $_{(df=1, N=70)} = 5.833$; $p < 0.05$).

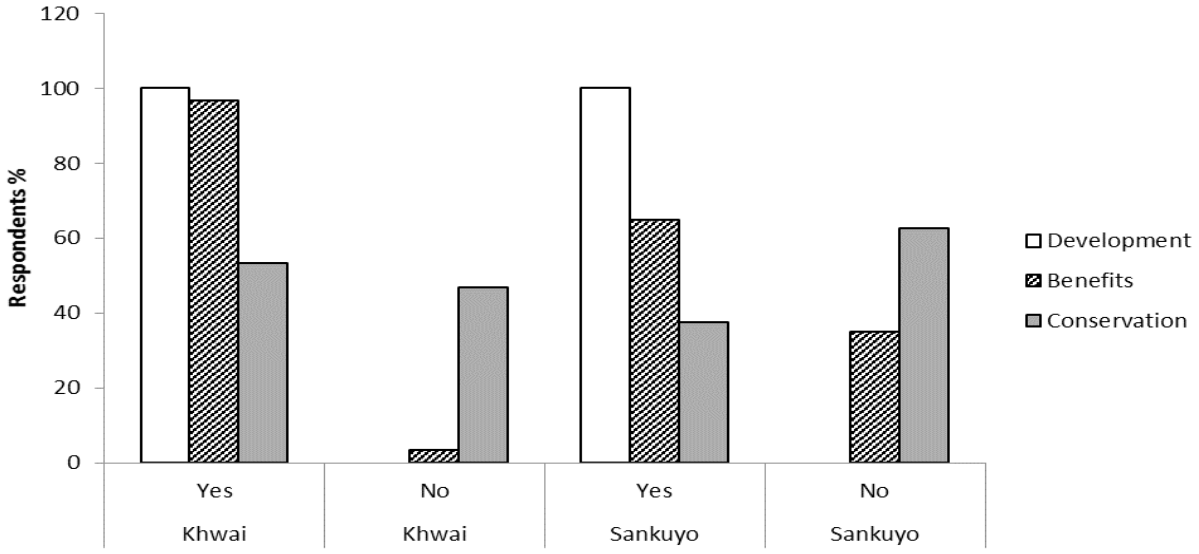
Photographic tourism was believed to be important in promoting conservation by 83% of the respondents in Khwai and 77.5% in Sankuyo. Respondents explained that unlike trophy hunting, photographic tourism does not kill animals but allows them to multiply and to spread over a large landscape. Although most respondents in the two communities generally supported photographic tourism as a viable conservation undertaking, 93% of the respondents in Sankuyo further pointed out that photographic tourism and hunting should be used alternately or side by side as management tools. They stated that if wildlife population is above the ecological carrying capacity of the area or limits of acceptable change, then trophy hunting should be allowed to regulate the population size and drive rural development through the sale of the trophies and consumption of game meat.

Perceptions on rural development, personal benefits, and conservation

Respondents were also examined on their perceptions of CBNRM in enhancing rural development and

conservation. As shown in Figure 2 below all respondents in Khwai and Sankuyo acknowledged that the CBNRM contributed to rural development in their respective communities. The respondents expressed satisfaction in the number and quality of development projects in their area and gave an example of the increasing number of modern residential houses built out of bricks and mortar for destitute members of their communities, and the increasing financial assistance to the village youth to train in vocational and professional courses in tourism.

Figure 2: Perceptions of the Sankuyo and Khwai Community on the importance of CBNRM to promoting development, benefits, and conservation in their community*



*This was in response to a question on 'Do you think CBNRM is important to rural development; generation of socio-economic benefits; resource conservation?'
Source: Survey Data 2013.

Furthermore, 96.7% and 65% of the respondents in Khwai and Sankuyo, respectively, pointed out that they derive significant personal benefits from the CBNRM through direct and indirect employment, and through running their own small businesses that are supported by goods and services from the CBNRM, as opposed to nothing (Chi-square $_{(df=1,\ N=70)} = 10.21$; $p < 0.05$). These small businesses utilise forest products found in the nearby forests such as grass for thatching houses; river reeds for making baskets, shelters, and walls; and firewood for domestic heating and for campfires in safari tourism camps. The respondents further added that benefits from the utilisation of forest products are supplemented by annual dividends given to each household at the end of every year. The significance of the CBNRM in employment creation was corroborated by the key informants (managers and chairpersons of the two community trusts) who reported that their CBNRM programmes created permanent jobs for guides, chefs, cleaners, waitresses and receptionists in tourism businesses in the area, and that most jobs were held by the youth from the community.

The key informants further stressed that revenue generated through the CBNRM projects can trickle down from the community level to the individual level in the form of salaries paid to the employees. We found that location variable among other demographic variables (ethnicity and gender age group, marital status, level of education, employment, and occupation) was the only factor that significantly influenced the respondents' response to a question on benefits generated by CBNRM (Chi-square $_{(df=1,\ N=70)} = 12.18$; $p < 0.05$). In terms of the influence of the CBNRM to resource conservation in the area, 53.3% of the

respondents in Khwai stated that the CBNRM supports conservation whereas in Sankuyo only 37.5% associated the CBNRM with conservation. Statistically, the response of the respondents to this question was not significantly associated with any of the demographic factors (level of education, gender, marital status, occupation, employment, locality, age group, and ethnicity).

Information sharing on projects

Respondents in both Khwai and Sankuyo were also asked about where and how they obtained information about the planned CBNRM projects in their communities. Five main sources of information were identified being government officials, friends and community members, relatives, public meetings called by the local authorities, and by the CBNRM community board. Overall, 47% of the respondents in the two study sites indicated the government officials and friends and community members as the main sources of information followed by public meetings called by local authorities (40%). A few of them indicated public meetings called by the community board (31%), and conversations with relatives (21%) to be the least source of information. As per locality most of the respondents in Khwai learned about the projects from friends and community members (53%) followed by the government officials (43%).

In Sankuyo the respondents said they came to know about the projects from government officials (50%) and friends and community members (43%). Overall, there was no significant difference between localities on how the information about the projects reached the respondents, except between the respondents themselves (Chi-square $_{(df=26)} = 61.67$; $p < 0.05$). The education level of the respondents was significantly associated with how the respondents learned about the projects (Analysis of Variance: $F_{4, 26} = 3.28$; $p < 0.05$). Those who had been to secondary and tertiary school learned more about the CBNRM projects in their locality from friends and community members than those who had no formal education or had only been to primary school (Analysis of Variance: $F_{4, 65} = 4.24$; $p < 0.05$). Those with no formal education or have not progressed beyond the primary school learned more about the projects from public meetings organized by government officials.

Discussion

Initiated conservation projects

Despite numerous reports that rural communities involved in the CBNRM programme are focusing only on economic benefits and not seriously implementing the conservation component of the programme (Kellert 2000; Arntzen *et al*., 2003; Pert *et al*., 2010; Mbaiwa 2015), our findings on the two CBNRM communities in northern Botswana indicate the contrary. Out of the seven conservation-focused projects that Khwai and Sankuyo communities had planned to undertake as indicated in the area management plan, over a half of these projects were done, with Khwai having initiated five of the seven (71%) and Sankuyo six of the seven (86%) planned projects within the five-year lease period of their respective management plans. The high initiation of the conservation-oriented projects by the two communities can be considered a success in the implementation of CBNRM. This study is apparently one of the few in the world that recorded the number of conservation projects that local communities managed to initiate through the CBNRM vis-à-vis those planned to be initiated during the implementation period of the management plan.

Although there are several criteria that have been used to indicate the success in the initiation or implementation of CBNRM projects world-wide (for example in Kellert 2000; Taylor 2009; Mbaiwa 2015), the method of this study determined the success by looking at the number of initiated projects over the total number of projects that were planned to be initiated within a five-year lease period. However, the weakness of this approach lies on the fact that it does not reveal the extent to which the initiation has progressed in terms of achieving the desired socio-economic and ecological goals of the project. Methods for evaluating success rate, especially for tangible conservation projects should be set and standardised across the globe

to facilitate sound evaluation, comparison, and determination of success in CBNRM. In many studies, the initiation of the conservation component of the CBNRM programme was simply reported by providing a list of benefits or projects associated with conservation as stated by the respondents when asked about them at the time of the study (for example in Mbaiwa 2004 and Jones 2009). The list of benefits or projects does not often indicate the number of implemented projects in relation to the total number of projects that the community had set out to do in the beginning.

Nonetheless, we acknowledge that it is not necessarily the number or the proportion of implemented projects that is key to conservation, but the impact of the implemented conservation project as perceived by the community. For example, a successful implementation of one single project such as the undertaking of the anti-poaching patrols or extinguishing forest fires may have a major positive impact or a turning point in the lives of the community compared to the implementation of two or several projects whose overall impact on the community might be small. In Namibia, for example, the establishment of conservancies alone drastically reduced wildlife poaching, expanded protected areas for wildlife, restored historical wildlife migration patterns and provided safe habitats for previously locally exterminated animal species such as the black rhinocerous (Cocks *et al*., 2001). This is an example of a single but massive project that brought a greater impact on the livelihoods of local communities as well as the implementation of the conservation component of CBNRM programme. Area management plans are critical documents in the management of a resource as they provide direction and guidance in planning, implementation, monitoring and evaluation of projects or resource status (Thrift *et al*., 1997). Management plans also provide vital baseline information on the status of the resources, potential threats and appropriate mitigation measures those managers should consider when executing any activity in the plan (Thrift *et al*., 1997 and Mawdsley *et al*. 2009). Managers, therefore, should often refer to their management plans to measure progress towards achieving the desired goals and objectives as set in the plan. Khwai and Sankuyo communities regularly referred to the management plans to guide them throughout the five-year period of their land head leases.

Considering that a snapshot of the conservation projects in a five-year management plan is usually inadequate to provide a detailed and long-term trend analysis of progress in the initiation of the conservation component of CBNRM, the advice is that future studies should focus on long-term reviews that evaluate the implementation progress since the start of the CBNRM. It is not always a guarantee that all planned projects would be implemented as planned and within the set time frames because of emerging challenges, needs and uncertainties that may cause a delay, adjustment, deferment, or total abandonment of a project. Deferring or abandoning a project can be an investment since such decision can bring more savings than if the project is implemented only to end up failing. In this study, the abandonment of the trophy hunting and waterhole projects by the Khwai community was reported to be a management decision based on the prevailing and convincing circumstances at the time. For example, just before Khwai could be fully implement the management plan of 2010, unprecedented large declines in wildlife numbers were reported in the Chobe region and the Okavango Delta which Khwai is part of (see DWNP 2012 and Chase 2013). In response to the 2010 report by Chase (2013) on declining wildlife populations in northern Botswana attributed to poaching, the government of Botswana imposed a hunting moratorium country-wide that came into effect from 2014 to 2019 (Republic of Botswana 2014). The decision to impose the hunting ban by the government of Botswana was taken amidst doubts expressed by the academics on the validity of the wildlife census data (Gifford 2013; Kaunda 2013; Mbaiwa 2018), and a strong opposition from the hunting industry and local communities on the blanket application of the ban (Onishi 2015 and Mbaiwa 2018).

Because of the uncertainties in the future of wildlife hunting in Botswana at the time the Khwai community gave in and made a concession with the government to suspend hunting and venture into photographic tourism. The decision by the Khwai community to change to photographic tourism which is considered non-consumptive was collaborated by the Khwai CBNRM programme manager. Hunting is

considered a consumptive activity and if it is not properly regulated it can exacerbate wildlife declines and eventually cause extinction of some local species (Abensperg-Traun 2009). However, when a hunting ban is introduced, it is critical that adequate consultations with key stakeholders are done to minimize opposition and entrenchment of negative attitudes by communities towards wildlife (Mbaiwa 2018, Mogomotsi et al. 2020). Consultation with affected communities on development is also a time-honoured and critical aspect of governance in Botswana mostly through the traditional *kgotla* forum. However, since the hunting ban was introduced in 2014, incidents of increased human wildlife conflict in the form of poaching, crop and livestock depredations, property damage, poverty increase, loss of revenue, loss of jobs, human deaths, and resentment towards the current wildlife conservation strategies were reported especially from areas near protected areas (Onishi 2015; Gontse *et al*., 2018; Mbaiwa 2018; Blackie 2019; Schlossberg *et al*., 2019; Madzwamuse *et al*., 2020). To address this conflict, in 2019 the government of Botswana under the newly elected President resolved to lift the ban on hunting, effective from 2019. The decision to lift the ban was largely informed by a series of consultation meetings with the local communities and other key stakeholders (Madzwamuse *et al*., 2020), which further proposed the review of the CBNRM policies, elephant management plan, human-wildlife conflict strategies, and compensation payments to farmers whose crops, livestock and other property are damaged by wildlife.

Importance of initiated projects

Evaluation of the importance of the conservation-focused projects was based on their impact on the environment and biodiversity conservation. Projects that provided tangible benefits to the community and the environment were perceived as important. For example, escort guiding, which entailed escorting and guiding trophy hunters and tourists in a safari and undertaking anti-poaching patrols, was considered by almost all the respondents in Sankuyo and Khwai as being important. The Sankuyo community was conscious that if poaching was not controlled, wildlife offtake rates would decrease over time and wildlife numbers would become too low to support continuous harvest. And as a community that is dependent on wildlife for food resources, they would be most affected by reduced offtake levels and consequently by local extinctions of high-value wildlife species as was observed in Southeast Asia (Harrison *et al*., 2016). The sharp declines in populations of some wildlife species in northern Botswana that were reported between 2010 and 2012 (Republic of Botswana 2012 and Chase 2013), despite being disputed, encouraged the Sankuyo and Khwai communities to intensify wildlife monitoring in their areas in order that they can engage meaningfully in future with the government on policy issues concerning wildlife numbers, hunting, and poaching. The latter factor was suggested to be one of the potential drivers of wildlife declines in northern Botswana (Chase 2013 and Schlossberg *et al*., 2019). The hunting ban and the change of land use from hunting to photographic tourism in Khwai did not stop the Khwai community from continuing with the anti-poaching campaigns in their areas because they were aware that poachers, who are reported to be from outside the community, would continue poaching despite change in land use.

A paucity of reliable and area specific data on wildlife poaching limited our ability to validate community perceptions on the contribution of community based anti-poaching patrols in suppressing poaching. Therefore, future studies should endeavor to augment qualitative data with quantitative data to broaden our understanding of poaching trends as they respond to different management interventions such as local community involvement in anti-poaching and initiation and removal of the hunting ban. Sankuyo and Khwai communities viewed photographic tourism as important in promoting recovery of wildlife populations. However, the Sankuyo community cautioned that photographic tourism is just an adaptive management strategy that should be used only when wildlife numbers are lower than the carrying capacity of the area. However, they advised that when wildlife numbers are above the carrying capacity hunting should be allowed to reduce the numbers as well as generate socio-economic benefits through the sale of

wildlife trophies and consumption of game meat. Although the Khwai community was not initially in full support of the total ban on hunting it, nonetheless, stopped hunting and introduced photographic tourism earlier than Sankuyo community, probably because the hunting ban proposal was widely publicised by government before the start of the new management plan which came into effect in 2010 (Mbaiwa 2018). At the time of this study the key informant at the DWNP reported some successes in conservation because of photographic tourism in Khwai and Sankuyo areas, citing an increase in population of some wildlife species and re-occurrence of some rare and threatened species such as wild dog *(Lycaon pictus*). Globally, rare, and endangered species are highly sought by tourists and sightings of such species can significantly boast the tourism potential and increase the financial returns for the local communities (Larm *et al*., 2018).

Perceptions on rural development, personal benefits, and conservation

As noted above, the three pillars of the CBNRM are conservation, empowerment, and benefits for local communities. The Khwai and Sankuyo communities have been successful in generating revenue and made decisions at the local level on the utilisation of funds as well as deciding on which socio-economic and conservation projects they should undertake for their respective communities (Mbaiwa 2005 and Thakadu 2005). The respondents in this study highlighted several benefits which they said trickled down to the individual level because of the CBNRM. Such benefits included the building of high-quality residential houses for the destitute members of the community, provision of scholarships for training in tourism for the village youth, employment of trained local youth in the tourism businesses run by the communities and earning of annual financial dividends at the community and household level (Kgathi and Ngwenya 2005; Mbaiwa and Stronza 2010).

Improvement in the living standards of local communities because of the engagement in the CBNRM programme is key to achieving sustainable conservation at a local level (Mbaiwa 2004). Therefore, the expansion of the CBNRM to cover many local communities living around the Okavango Delta will facilitate a concurrent spread and reconnection of localised conserved areas, and ultimately a creation of a large and safe landscape that can support large and diverse populations of wildlife. Migratory wildlife of the semi-arid savannas requires large landscapes that provide safety from poachers as well as conservation areas that are large and functionally connected (Fynn and Bonyongo 2011). These large landscapes will be able to provide seasonal dietary and reproductive requirements, and opportunities to engage in gainful hunting and photographic tourism (D'Haese and Kirsten 2003). The relatively marginal association of CBNRM with conservation by both Khwai and Sankuyo communities is unclear, but it could be that the other two components of the CBNRM (economic empowerment and rural development) were emphasized more than the conservation component by the first facilitators of CBNRM in Botswana since the programme started in the 1980s, and that could have made the two communities to regard CBNRM as primarily the economic empowerment and rural development strategy. Secondly, the announcements about the hunting ban in 2014 might also have negatively influenced community perceptions on CBNRM as a conservation tool.

Perhaps, the communities wanted to emphasize the point that economic empowerment and good governance are critical to achieving sustainable conservation. When in operation from 2014-2019, the hunting ban caused significant losses in revenue for most of the CBNRM communities that were dependent on hunting as a source of economic livelihood and sustenance of the CBNRM projects (Mbaiwa 2018). Hence, this may have been the fear that the communities had of losing revenue if strict conservation (or preservation in the case of a hunting ban) was always placed at the forefront of the CBNRM activities. Focus group discussion were not done in this study but could have helped to tease out elaborate answers from the respondents on the relationships or ranking of the three CBNRM components. Future studies, therefore, should explore the integration of focus group discussions and other data triangulation techniques to facilitate follow-ups to responses and elaborate discussions on critical issues that emerge during questionnaire interviews.

Information sharing on planned projects

Information sharing is critical in communities as it keeps community members posted on the developments and current issues affecting their livelihoods (Mwantimwa 2020). Constant communication builds relationships and trust among people and enhances knowledge and understanding of the purposes for undertaking certain projects in the community. Therefore, limited information sharing can demotivate community members from taking part in community activities. In Khwai and Sankuyo, respondents were knowledgeable about CBNRM projects in their respective localities but sources of their information and knowledge differed among the respondents depending on their level of education. Public meetings as a source of information largely benefitted community members with no formal education or had not gone beyond the primary education level whereas information exchange between friends, family members and community members largely benefited those with secondary and tertiary education. The reason could be because those with secondary and tertiary education were not always residing or available within the community to fully utilise public meetings.

There exists no secondary and tertiary education centres in the two communities and those furthering their education beyond the primary level must leave their communities and stay in towns that are over 100km away, thus missing the opportunity to utilise public meetings held in their communities for information about the CBNRM. The community members believed that information sharing through different sources enabled different levels of people to know about the CBNRM. This, they believed, increased synergy and motivated many members of the community to volunteer and participate in resource monitoring activities such as law enforcement, wildlife surveys, and anti-poaching activities. Nonetheless, the undertaking of anti-poaching activities by local communities is not unique to Khwai and Sankuyo. Many CBNRM communities around the world are embarking on joint or independent anti-poaching patrols to supplement government efforts, despite inherent risks associated with such an undertaking (Steinmetz *et al*., 2015; Cooney *et al*., 2017; Gaodirelwe *et al*., 2018). However, intense militarisation in anti-poaching efforts as opposed to strengthening the CBNRM can limit communities' self-control over wildlife, and further alienate communities from making meaningful contribution to resource conservation and protection (Massé *et al*., 2017; Hitchcock *et al*., 2020; Madzwamuse *et al*., 2020).

Conclusion

Conservation, empowerment, and generation of socio-economic benefits are the three essential pieces of a puzzle in the CBNRM dispensation. All the three components are important and critical for the sustainability of the CBNRM process. The high proportion of initiated conservation-oriented projects in this study within the five-year period of the land lease indicates positive efforts by the Khwai and Sankuyo communities in implementing the conservation component of the CBNRM. All the seven projects indicated in the management plans were classified as projects of high conservation and socio-economic value by the Khwai and Sankuyo communities. The results demonstrate that local communities in the study area appreciated principles of the CBNRM and can be key partners in driving national agendas on biodiversity conservation and monitoring.

The positive perceptions held by local communities engaged in CBNRM, the pro-conservation projects initiated such as anti-poaching patrols, and verbal reports of increased presence of rare wildlife species illustrate the significance of CBNRM communities in creating potential biodiversity hotspots and functional landscapes for wildlife conservation. The expansion of CBNRM to cover all local communities residing around protected areas can increase land available for wildlife and consequently increase sustainable tourism opportunities for local communities. If adequately conceptualised and be part of the long-term development strategy the CBNRM can be a driver of biodiversity conservation in local community areas.

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