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# **Resilience and Coping Strategies against Socio-Ecological Risks: A Case of Livelihoods in a Botswana Rural Community.**

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## **Abstract**

With the eminence of sustainable development (SD) as a framework for responding to socio-ecological risks in communities, the risks are likely to persist for poor rural communities resulting from diminishing benefits from their natural resource base on which their livelihoods are sustained. This is in spite of the extensive promotion of community natural resource management approaches that have taken place in the past decade to alleviate these risks. Such communities can be viewed as part of socio-ecological systems that, when resilience and coping strategies are lacking within them, can collapse further into an undesirable state of socio-economic risks. The survival of these communities can sometimes be complex and costly if not properly managed and supported.

Using a single case study in a poor rural community in Chobe, we further illustrate how an individual in these rural communities can develop resilience and coping strategies in the face of impending socio-ecological risks, to sustain their livelihood. This is demonstrated by examining the initiative of a blacksmith in Botswana, who through his blacksmith skills has been able to sustain himself. Through interviews and observations from the case, we further illustrate that not only is this a form of resilience and development of coping strategies, but also an opportunity for Community Natural Development Management (CBNRM) SD schemes to contribute to, and indeed learn from such initiatives to further enhance capacity building in such communities.

**Keywords:** Resilience, coping strategies, CBNRM, socio-ecological risks, natural resources, livelihoods interest

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## **1.0 Introduction**

A number of achievements and attempts in Botswana have been made in the past decade in terms of meeting the Sustainable Development (SD) agenda (World Commission on Environment and Development [WCED], 1987), in order to improve the relationship between rural community livelihoods and their immediate

environment. These attempts seek to address the stress created by both human activities and natural processes and their impact on livelihoods and the natural environment.

The efforts in Botswana to respond to the SD agenda, while valuable, seem to fall short of highlighting key issues, including (a) how such attempts ultimately address the resilience inherent within these communities to sustain their social well-being in the face of socio-ecological risks; (b) existing opportunities and coping strategies to achieve sustainable livelihoods; and (c) beyond that, how these can contribute to SD. As noted by Folke (2006), “in a resilient social–ecological system, disturbance has the potential to create opportunity for doing new things, for innovation and for development” (p. 253), alluding to the fact that communities can sometimes ingeniously take it upon themselves to improve their livelihoods under the most difficult conditions. Botswana has followed the global initiatives to respond to the SD agenda through its focus on the needs and risks for rural communities by putting in place a number of sustainability initiatives among which are integrating the livelihood concerns and contexts of poor people in policy processes. This has been achieved through facilitating access for the rural poor to, and control over, natural resources through institutional mechanisms such as community-based natural resource management schemes (CBNRMs) (Arntzen, Molokomme, Terry, Moleele, Tshosa & Mazambani, 2003; Mbaiwa, 2004; Stone, 2013).

## **2.0 Community-Based Natural Resource Management (CBNRMs) as an SD approach**

Within the CBNRM approach, the community becomes the key role player and an integral part in the utilization and management of natural resources. In Botswana CBNRM has been adopted by the government as one of the main approaches that aim at achieving rural socio-economic development and natural resource management to sustain rural communities. The whole aim of CBNRMs is to ensure equitable distribution of costs, benefits, decision-making and management, which in theory, should eradicate poverty leading to ecological sustainability. This ecological sustainability is based on the assumption that the dynamic processes of the natural environment can become unsustainable as a result of stresses imposed by human activity to sustain their livelihoods (WCED, 1987).

The CBNRM programme is premised on the assumption that when community livelihoods are improved through sustainable utilization, management and conservation of their natural resources, and through participation in activities such as tourism, communities would be obliged to conserve natural resources such as wildlife around them (Mbaiwa, 2018, p. 42). This is because as they derive benefits from natural resources in their local area, their livelihoods will be improved (Mbaiwa & Stronza, 2010). When the CBNRM programme was officially adopted by the Botswana Government in the 1990s it initially focused on safari hunting as the main tourism activity. When the program was initially incepted, policy directives of the wildlife and tourism sectors provided the framework for allowing rural communities to gain user rights over wildlife and tourism on their land and to benefit from the commercial exploitation of these resources within the bounds of sustainability. Communities who resided in what were formally controlled hunting areas (CHAs) were granted resource leases over wildlife and tourism on their land for a period of up to 15 years from the Tribal Land Board if they had formed a legal entity, such as a community trust (Jones, 2002). Safari hunting in Botswana was

prevalent in the Okavango, Chobe and Makgadikgadi regions as one major CBNRM income generating activity in the local community-based tourism initiatives of the CBNRM programme for these poor rural communities.

But in 2014 hunting was banned in Botswana. The government reasons for the ban were that poor hunting controls and ethics contributed to wildlife decline (Mbaiwa, 2018). The Botswana government cited wildlife decline as the main reason for introducing the ban (Mbaiwa, 2018). However, Mbaiwa found that the hunting ban has reduced huge benefits generated by communities from safari hunting such as income, employment opportunities and quality of community livelihoods which are already considered poor according to Botswana standards.

### ***2.1 CBNRM as a Concept of Building Human Capacities Towards Sustainable Development***

The CBNRM approach is based on the concept of sustainable development which in turn is anchored on three broad concerns, namely natural resource conservation, economic efficiency which aims for the optimal use of natural resources to produce the maximum output in order to achieve a high standard of living for the people within the constraints of the existing natural capital (United Nations Sustainable Development [UNCED], 1992), and social equity which advocates fairness and equal access to resources by all user groups. Sen's (2005, 2009) conceptualisation of SD places emphasis on socio-ecological resilience, focus on human capabilities and freedoms within the capabilities approach. He argues for a sustainable development approach that has within its framework the basic principles of capabilities, functioning, agency and development of real opportunities based on personal and social circumstance which consider individuals' or communities' rights and freedoms to make choices and act within their social contexts. Lotz-Sisitka (2010) views sustainability within an SD framework in relation to the strengthening of social ecological resilience and participation practices of people. This, according to Lotz-Sisitka can be achieved through deliberating on people's valued beings and doings in the context of socio-ecological change and risk. The social ecological resilience concept seeks to understand the adaptive capacity of society and how society and ecosystems mediate, adapt, and change community livelihoods. The positions taken by these scholars are directed towards building people's capabilities and capacities within any risks that they are vulnerable to (Sen, 2009).

Livelihoods, according to Ellis (2000), "comprise[d] of assets (natural, physical, human, financial and social capital), the activities, and the access to these (mediated by institutions and social relations) that together determine the living gained by the individual or household" (pg. 19). Ellis submits that activities are achieved through strategies in which households generate their livelihoods supported by various institutions and organisations and this view is supported by Kgathi, Ngwenya and Wilk (2007) as is the case in Parakarungu where livelihoods are usually sustained by the CBNRM activities as well. Kgathi et. al, (2007) argue that households use a combination of assets which require different forms of capital to secure their livelihoods through activities that require access to these forms of capital.

Parakarungu community has benefited from the CBNRM strategy by being part of a community-based trust known as the Chobe Enclave Conservation Trust (CECT) together with four other villages in the enclave (Stone, 2013). The main focus of the trust has been to achieve rural economic development and natural resource

management within the enclave through income generating activities by forming community-private partnerships mainly in the tourism sector which has provided employment opportunities for the villagers. Stone (2013) notes that before the introduction of tourism in the enclave, which is located within the Chobe National Park, the area was endowed with natural capital in the form wild animals. She highlights that in order to “protect the park from the community, decisions taken during the colonial and post-colonial period included abolishing traditional hunting, further accentuating the polarization of natural capital from the community” (Stone, 2013, p. 52).

Before the hunting ban, the community-based trust was allocated a Controlled Hunting Area (CHA) and a wildlife quota by the Department of Wildlife and National Parks which generated revenue to enhance the financial capital for the community (Mbaiwa, 2004; Mbaiwa & Stronza, 2010; Stone, 2013). The main benefit accrued out of the revenue generated from this arrangement in Parakarungu was the reinvestment of the financial capital into projects that include a traditional handicraft group, tractors for ploughing, a grinding mill, a lodge, a camp site, village hall, brick moulding workshop, and a shop, all of which “created new forms of capitals that diversified the community revenue generating flows” (Stone, 2013, p. 58). As a local CBNRM institution, the trust provides leadership in the use of land and natural resources (Stone, 2013). This participation by the community in the use and management of their natural resources ‘has promoted the diversification of income and employment opportunities, supplementing subsistence farming’ (Stone, 2013, p. 80). While this could somewhat be viewed as having brought some stability in the community’s access to economic and social development it is worth noting that quite often the stability in accessing these can be met with risks and shocks one of which has been the hunting ban which has greatly reduced the revenue for the communities affected (Mbaiwa, 2018). Further risks could include drought, diseases (e.g., of animals such as foot and mouth), pests, floods, and so forth (Ellis, 2000).

However, Mbaiwa, (2004) in his assessment and review of the impact of CBNRMs on livelihoods in the Okavango Delta—which is adjacent to Chobe district—observed that while these initiatives are meant so that rural communities can derive socio-economic benefits from these schemes—such as participation in decision-making, employment and income generation—there is a lack of entrepreneurship and managerial skills, understanding of the concept of CBNRM, and poor benefit sharing in CBNRM participants, which further exposes these communities to more socio-ecological risks.

Against this brief background, this paper has the following objectives: To uncover the risks and vulnerabilities that rural communities in Chobe—specifically Parakarungu—are exposed to and to identify the individual resilience and capacity—coping strategies—that reside in the rural poor to sustain their livelihoods.

It further recommends how SD initiatives such as CBNRMs can draw on existing coping strategies. To respond to the above objectives, the paper uses empirical evidence of a case example of a Parakarungu village blacksmith by examining the socio-ecological risks the rural community—of which he is part—is exposed to. Within the prevailing livelihood activities that sustain the Parakarungu community, the article further examines how he attempts to respond to the risks he is exposed to and how vulnerable community members like him develop coping strategies. We further discuss the potential ability that exists for SD schemes to contribute to his

initiatives as a form of coping practices by drawing on social–ecological systems resilience and sustainable development (SD) literature.

### **3.0 Livelihood Activities in the Parakarungu**

Livelihoods for the community of Parakarungu village—living adjacent to the Chobe National Park and located on a belt that runs along the Chobe River Basin in the northern part of Botswana—are predominantly sustained by surrounding natural resources and subsistence agriculture. The village is located in a buffer zone which is divided into two controlled areas, one which was initially for hunting tourism and the other for non-consumptive photographic tourism (Stone, 2013). But with the hunting ban, only the latter is now in effect. The community is isolated from any major economic opportunities as there are not many government oriented economic developments because much of the development is concentrated in and around Kasane (Stone, 2013), a small town which is the economic hub of the Chobe region. There are no major shops or services such as fuel stations, and residents have to travel approximately 70 kms through the Chobe National Park to Kasane to get their basic requirements. The estimated population of the village community is 845 according to the Botswana Population & Housing Census of 2011 (Stone, 2013).

The isolation of this rural community has created a dependence on natural resources such as firewood, thatching grass, reeds, and building poles for their huts, used by almost all households for subsistence purposes (Jones, 2002; Stone, 2013). The village has a mixed economy based on community-based tourism, subsistence livestock farming, crop production, fishing, and basket making. The sale of livestock from which some villagers get minimum returns is hampered by the recurrent foot and mouth disease outbreaks which are linked to the village's proximity to the Chobe National Park. Women in Parakarungu who are mainly unemployed make a living by cutting grass and river reeds which they sell to lodges around the Chobe region. Together with men who observe closing season for fishing, women also observe closing season for cutting grass and river reeds (Cassidy & Barnes, 2012; Jones, 2002; Stone, 2013). However, it is evident that community livelihoods are inextricably linked to their natural resources for survival, hence they have substantially benefitted from these natural resources to sustain their livelihoods. The government of Botswana through its Ministry of Environment, Natural Resources Conservation and Tourism and Ministry of Agriculture guide and regulate these activities for the various seasons.

#### ***3.1 Overview of Risks and Shocks in the Community***

While CBNRM projects have provided community members with employment within CECT and in tourism establishments around the village, a benefit has not been realised by all members of the community at the household level (Mbaiwa, 2004; Mbaiwa & Stronza, 2010; Stone, 2013). The situation has become worse with the hunting ban. As Mbaiwa (2004) notes, with CBNRM projects in the Okavango region, so it is with CECT in Parakarungu where the trust's initiatives:

are constrained by factors such as lack of entrepreneurship and managerial skills in the tourism business, that is the lack of training and capacity building, insecurity of tenure, conflicts between stakeholders, management problems of community trusts and misuse of funds (Mbaiwa, 2004, p.48).

These directly affect the successful performance community based projects which often fail and close down (Mbaiwa, 2004). Resulting from these constraining factors, inevitably there is capital deficit which spirals down to uneven participation of community members and fair distribution of the benefits (Mbaiwa, 2004; Stone, 2013).

Stone (2013) observes that other risk emanates from factors associated with natural capital, for example, the channels from the Chobe (and Okavango) rivers on which the community depends for its agricultural activities “sometimes dry up leading to shortages in the supply of water for the cattle industry. Furthermore, the quality of grass around the river deteriorates during the dry season and good pastures become hard to find” (p. 96). The Chobe area, like the adjacent Okavango Delta region, intermittently experiences shocks which include: (a) animal diseases such as foot and mouth disease and cattle lung disease, (b) human diseases like HIV/AIDS, and (c) recurrent droughts and changing flooding patterns from the Chobe and Okavango rivers, which influence access to natural capital such as water for human and animal consumption (Kgathi et al., 2007; Mbaiwa, 2004). Other than recurrent droughts, the desiccation of river channels and the killing of livestock by predators, the culling of a large number of cattle in an attempt to eradicate cattle diseases since 1995/1996 to protect the lucrative European Union beef market has constrained livestock production in the Chobe area (Mbaiwa, 2004). This affected farmers in the community who normally sold through the Botswana Meat Commission (BMC) which would buy animals at more lucrative prices (Kgathi et al., 2007; Stone 2013). This, together with human-wildlife conflicts (Stone, 2013) and the lack of veterinary and marketing services—which results in the main market being located near butcheries around Kasane (Kgathi et al., 2007; Mbaiwa, 2004; Stone, 20013) in which the farmers are more often than not short-changed by the middle man—has adversely affected livelihoods in the past 25 years in Parakarungu, resulting in some of them abandoning cattle farming altogether and focusing on arable farming and other activities instead.

Stone (2013) further notes that because of diminishing benefits from livestock farming, the tilling of land after the procurement of tractors from CBNRM proceeds, is prolonging the ploughing season and increasing the demand for land. A resultant risk from this is more human-wildlife conflicts and the depletion of wild-life—flora and fauna—further threatening the resource base for meeting other needs such as fire-wood, grass for basket weaving, and so forth. These risks have resulted in the community becoming engaged in different activities for which they lack suitable skills and knowledge (Mbaiwa, 2004) and in some instances the necessary resources to carry out these activities. Through CBNRM initiatives, environmental education and awareness offered by different agencies—such as the Department of Wildlife and National Parks’ community extension and anti-poaching units, non-governmental organizations like Kalahari Conservation Society, USAID, and so forth—have played a significant role in resolving the management of natural resources, sometimes through training workshops (Stone, 2013). This response however doesn’t seem to efficiently yield the desired outcomes (Mbaiwa, 2004) as will be revealed in the case study to be discussed in later sections.

### ***3.2 Resilience as Part of Socio-ecological Systems in Communities***

The resilience discourse provides a framework that could give insight into the community’s complex, dynamic human–environment interactions (Berkes & Folke,

1998; Folke, 2006; Folke, Colding & Berkes, 2003; Scott, 2013). This helps to put into perspective how a community like Parakarungu that is exposed and highly vulnerable to social-ecological risks highlighted in the previous section copes against these risks. Cassidy and Barnes (2012) in their analysis of household connectivity and resilience in marginal rural communities in a small village of Habu in the Okavango Delta, highlight the fact that the “resilience approach recognizes that there is no single stable state in a social–ecological system (SES), but that the system is exposed to different ‘shocks’ that challenge its fundamental identity and make it dynamic” (p. 1). They are alluding to the fact that socio-ecological systems in rural communities such as in Parakarungu where they are continually exposed to socio-ecological risks highlighted in the previous sections, the systems become resilient and develop adaptive capacity or coping mechanisms to absorb shocks and adapt to new challenges without changing their fundamental structure and function (Gunderson & Holling 2002). Adger (as cited by Folke, 2006) argues that social–ecological systems being resilient, inevitable disturbance—which comes in the form of risks and shocks—has the potential to create opportunities for doing new things, for innovation and for development. Folke emphasises that in a vulnerable system even small disturbances may cause dramatic social consequences (Folke, 2006, p. 253). Resilience theories portray the interaction between social and ecological systems as complex and dependent on feedbacks among multiple factors that eventually allow these systems to self-organize (Folke, 2006, p. 257).

This goes to illustrate that the interactions in socio-ecological systems for Parakarungu where the shift between the state in ecosystems is increasingly a consequence of human actions and natural forces which result in the erosion of functions of biological diversity and subsequently impacts on livelihood and societal development (Folke et al., 2004), the combined effects of those pressures make social–ecological systems more vulnerable (Folke, 2006) and leaves communities and ecosystems with no option but to mediate, adapt, and learn from these changes (Krasny, Lundholm, & Plum, 2010, p. 665). This capacity in turn relies on the community’s capacity for social learning and innovation (Walker & Salt 2006).

For the purpose of this paper we describe and provide an overview of how the attributes of resilient systems are embodied in the practice of the village blacksmith in Parakarungu. We then discuss the potential within the resilience framework of this blacksmith and how SD schemes through CBNRMs could positively and efficiently contribute to the social-ecological system resilience through this villager’s practice.

#### **4.0 Methods**

The single case study methodology was used in this research primarily using unstructured interviews and observations. It focussed on one participant who is the sole blacksmith in the village. A single case study was used for this research as it allowed for close examination of the embedded unit of analysis of one member within the community. Yin (2009) recognizes that such a case could be embedded within a community with other members that could also be undertaking some initiatives to respond to the risks the community is subjected to, within the broader socio-cultural, economic and historical context that affects him differently. While case study methodology recognizes that context is a powerful determinant of both causes and effects which necessitates in-depth investigation (Cohen, Manion, & Morrison, 2007) using a single case further enabled the investigation of the blacksmith’s activities under a unique socio-cultural context thereby revealing the



uniqueness of factors his practice (Cohen et al., 2007) taking cognisance of the fact that while the case study captures an ‘instance’ of practice, this instance of practice is part of a bigger story in the community (Lotz-Sisitka & Raven, 2004, p. 79). The purpose of single case studies according to Solberg Søylen & Huber (2006), is to generate background material to a discussion about a concrete problem that could probably be used as a benchmark for solutions to similar problems. Case studies are also often used when it is hard to find a precise solution (Solberg Søylen & Huber (2006). Further, Dyer and Wilkins (1991) have argued that as much as it is not a guarantee that rich theoretical insights will be produced when studying a single case study in detail, it is neither a guarantee that multiple case studies will produce this kind of insight.

The selection of the participant was based on the observations by the second author (Serome) who is a resident in the village and is aware of the socio-ecological risks that villagers are exposed to. We were particularly interested in this blacksmith’s unique practice, which emerged from the village context that has experienced complex interacting social and ecological disturbances such as droughts, animal diseases, the hunting ban and CBNRMs that have not benefited everyone optimally. Also of interest is the fact that in spite these disturbances and risks he has drawn on a practice that his father had used for years as a coping strategy to sustain him and his family though marginally so. He was interviewed in the local language (SiSubiya), the only language he could speak fluently.

The interviews were done depending on the blacksmith’s availability and willingness to participate. Questions were asked on the practice’s origins, motivation to undertake this practice, sources of support, and the role played by his practice in the village and beyond. The interview data were augmented by informal discussions and observations of his practice and related activities. To ensure trustworthiness, these data were discussed with the first author (Silo), who has some experience in conducting informal interviews as part of her educational research background in environmental education related issues with local rural communities. Although the interviews were largely unstructured in that there was no predetermined sequence of questions or specific wording, the researcher already had in mind a general topic— ecological and social sustainability and livelihood sustenance in the village. The issue of the role of this blacksmith’s practice in providing livelihood security in contexts of environmental vulnerability emerged as an important theme during discussions with the blacksmith. The unstructured nature of the interviews allowed him to express himself freely and at length and enabled capturing of unexpected insights on his practice and related issues that otherwise might have been missed from a more structured questioning approach. Interviews were substantiated and triangulated with observations of the man’s activities.

#### **4.1 Data Analysis**

Data gleaned from the informal, unstructured interviews with the blacksmith, observations of his practice and secondary data sources were then analyzed to develop the definition and dimensions of this participant’s resilience and coping strategies. A content analysis was conducted on the resilience and SD literature to operationalize the resilience construct (Magis, 2010) as it related to this village blacksmith practice. The analysis focuses on the coping strategies of the blacksmith by analysing his practices and activities as a way of resilience in responding to the risks that the community is exposed to.

## **5.0 Results and Discussions**

The objectives that framed this study are used in this section to first describe the blacksmith's practice and subsistence strategies that sustain his livelihood in the face of socio-ecological risks that the blacksmith is exposed to, which were largely discussed in earlier sections. We then focus on his practice and its application in local social-ecological system resilience and SD initiatives in the community. Throughout this section we integrate results from this study with theoretical perspectives and results from the resilience and SD education literature.

### ***5.1 The Blacksmith's Practice and Coping Strategies***

Mr Chidino Kuhane<sup>1</sup> is a 58-year-old married man with seven children and some grand children in the small village of Parakarungu. His main subsistence activities are crop farming and fishing to sustain himself and his family's livelihood. When there are good rains, like the rest of the community he sells his harvest to Botswana Marketing Board (BMB) in Pandamatenga which is a border town near Kasane and this is also done through the farmer's committee. He cultivates mainly maize and very little sorghum. During the fishing season he sells his fish in Kasane. These activities do not seem to generate enough income to sustain his large family.

In spite of the CBNRM activities (discussed in the earlier sections of this paper) in and around his village, he is one of the community members who are unemployed in the CBNRM projects as the jobs are limited. However, he had been for some time benefiting from the use of the tractors that are part of the programmes' assets. But with the reduced income for the CBNRM programmes due to the loss of income from the hunting ban (Mbaiwa, 2018), accessing tractors is proving to be a problem as they are not well maintained. Though a number of village farmers use cattle as an alternative resource for ploughing, Mr Kuhane is amongst those people without any livestock as he has abandoned it because of the high risks highlighted earlier associated with livestock farming.

I had a few cattle but the last time they culled our animals due to foot and mouth, which recurs frequently because of our close proximity to wildlife (in the Chobe National Park) I decided to be fully compensated even though we were not getting anything much, I thought... why opt for re-stocking when they are going to come back and kill them again with another outbreak! And besides with BMC no longer buying our cattle, you feel you are not gaining anything as these butcheries just cheat us and only give us a pittance for our cattle....I quit when it came to cattle I can't plough since we have to compete for tractors and I have no cattle I can use as an alternative....I'm now spending my time making these hoes as you can see....That is what I have resorted to doing to feed my family (Mr. Chidino Kuhane, February 15, 2017).

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<sup>1</sup> This is not the real name

He now mainly makes his income as a blacksmith by using scrap metal to make items such as hoes, knives, metal buckets and bath tubs. He says he was inspired in this trade and taught by his late father who was also involved in this project for many years and due to lack of formal employment and reduced income from farming in the village. He decided to take the practice seriously as a way of augmenting his income. Concerning CBNRM activities, limited participation in them and how they are unable to offer employment opportunities to everyone, he says:

How many of us can they employ? Besides they do their thing alone there and it depends on who you are to be involved! Again most of the jobs require people who are educated, so for some of us we don't stand a chance... (Mr. Chidino Kuhane, February 15, 2017).

For his trade he has constructed a furnace with an attached fan for melting metal (see Figure 1). He uses scrap metals and corrugated iron sheets which he picks from around the village to make items like hoes, knives, bath-tubs and others (see Figure 2). In some instances, the community brings scrap metal for him to buy or make items for them. For his furnace he uses charcoal which he makes from firewood. He has made his furnace small and closed so that it does not consume a lot of charcoal. Depending on the demand for his wares, he can sometimes make up to P500<sup>2</sup> a week, but when the sales are good, up to P1,000. The money buys food for the family, school uniforms and clothes for his children. He also uses the money to purchase scrap metal and for transport to and from Kasane.



Figure 1: The furnace with attached fan.



Figure 2: Some of the items.

He faces quite a number of challenges which include working alone because he cannot afford to pay employees. It takes him several hours to make his products as he has to keep on re-heating in order to mould the item to the shape that he desires. This becomes costly because of the extra firewood required. One of his sons sometimes assists him but only when he is available and not busy with school work. He sometimes runs out of money to buy scrap metal and has to go and buy it in Kasane, which becomes more expensive due to transporting the material. He also lacks storage space and when it rains the charcoal gets wet which slows down his work. With the growth of the village, getting firewood is proving to be a challenge, but he has structured his furnace such that, though he uses a large amount of charcoal, it is very economic.

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<sup>2</sup> Pula (P) is the Botswana currency which, at the time the study was conducted in February, 2017, USD \$1 was approximately an equivalent to P10

## **5.2 Meaningful Participation in Sustainable Development Initiatives**

It is evident that although the community of Parakarungu is exposed to risks associated with the natural capital such as droughts, river channel desiccation, cattle diseases and diminishing resources, the CBNRM initiative has been the main sustainable development instrument to respond to these risks. The initiative has at a community collective level, as Mbaiwa (2004) observed in other CBNRM projects in the Okavango, had some “considerable amount of revenue and employment opportunities”(p. 48). According to the objective of sustainable development as initially intended (WCED, 1987) the organized involvement of the local community in the utilization and management of their natural resources through the establishment of a trust (CECT) has been realised as the community is reaping benefits from resources such as tractors, employment in craft shops, and lodges: all of which contribute to the financial capital of the community. But with the ban on hunting—which was a major source of revenue—the financial loss from the hunting quotas has impacted on these benefits. However, as insinuated by the blacksmith, the CBNRM project benefits do not seem to translate to direct benefits at the individual level to everyone in the community as there is no direct involvement of, and employment for this blacksmith in any of the activities, hence no direct financial benefit for his household. This has been compounded by his loss of benefit from tractors. The CBNRM’s primary objective of conservation has ignored the social empowerment and economic development for all individuals in the community as noted by Mbaiwa (2004, p.49). For somebody like Mr Kuhane who has taken such a self-sustaining initiative, the CBNRM project through its various stakeholders could enhance the capacity building and development of his social capital drawing on his unique practice, skill and technology (Krasny & Roth, 2010; Lundholm & Plummer, 2010; Robinson & Berkes, 2011). Robinson and Berkes, (2011) in their illustration of multi-level participation for building adaptive capacity and agency in community interactions in northern Kenya, emphasize that multi-level, networked participation is a vital component in building social–ecological resilience and the capacity to adapt to environmental change through strengthening existing practices and processes where institutional linkages, participation and deliberation can be created to work together to promote knowledge co-production for adaptive capacity. They contend that new knowledge, technology, and adaptations such as those exhibited by the blacksmith can be accessed and developed through contacts with higher levels of organization like nongovernmental organisations (NGOs) and government institutions like the Department of Wildlife and National Parks that drive the CBNRM projects. Berkes and Ross (2013) would argue that in order to enhance the blacksmith’s resilience, adaptive capacity and coping strategy through the furnace technology he has developed, he can be supported through “networks, deliberation, and inclusivity” (p. 8–9). They are alluding to the fact that individuals like him, can be supported through building strong and focused networks by involving them in co-engagement deliberations with relevant supporting stakeholders. In this way, their capabilities and capacities can be enhanced (Sen, 2009; Krasny & Roth, 2010). Beyond developing the blacksmith’s capability, the technology he is using can be improved for maximum production as well as for better management of natural resources, in this case the fuel-wood that he is using for the practice.

Krasny & Roth, (2010) suggest that in a community like Parakarungu with skilled individuals such as Mr Kuhane, who display such high adaptive capacity and resilience, “one way to build adaptive capacity in social systems and thus foster

resilience would be to build capacity” (p. 546) in as many individuals as possible. Stakeholder participants like the Department of Wildlife and National Parks, which is the chief custodian of CBNRMs and NGOs like Kalahari Conservation Society, and others, can facilitate multi-level interactions, which, in turn, can lead to social learning and resilience building. . This is because according to Cassidy and Barnes (2012), for a rural community such as Parakarungu, resilience in a socio-ecological system does not necessarily mean all components (i.e., households) have the same degree of resilience hence calling for context-based support for different individuals in the community.

### ***5.3 Contribution of CBNRM Schemes in Sustainable Initiatives***

One other potential opportunity for enhancing resilience, adaptive capacity and the capability through this blacksmith’s practice and skill is for existing CBNRM schemes not only to support and develop him through multi-level interactions and participation (Berkes & Ross, 2013; Robinson & Berkes, 2011) but as well to draw on his knowledge and skill to further foster attributes of resilient social–ecological systems within the SD agenda. The general consensus is that the SD concept offers a framework that provides a different vantage point that engages people in SD issues, developing their capacities to give meaning to SD and to contribute to its development and utilizing the diversity represented by all people—including those who have been or feel marginalized—in generating innovative solutions to SD problems and crises (UNESCO, 2009, p. 7).

Drawing on Lotz-Sisitka’s (2010) emphasis on socio-ecological resilience for communities such as the one under study, Sen’s (2005, 2009) focus on human capabilities and freedoms and Landorf, Doscher, and Rocco’s (2008) sustainable human development, an argument for an SD approach that has within its framework the basic principles of capabilities, functioning, agency and development offers real opportunities for developing the blacksmith’s initiatives in and from his practice. Stakeholders involved with CBNRM projects and their partners could draw on the importance of local social–ecological system resilience of traditional knowledge and skill (Shava, Krasny, Tidball, & Zazu, 2010) that Mr Kuhane got from his late father, which according to Davidson-Hunt and Berkes (2003) is in the form of memories carried down over several generations. Blacksmithing as a form of indigenous knowledge has immense value in poverty eradication strategies in rural communities because the CBNRM activities could also need the hand tools from the blacksmith that the community can afford to develop. Shava et al (2010) specifically make reference to memories of sustainable management of a traditional legume in Zimbabwe as contributing to the resilience of indigenous communities following catastrophic “collapse of a commercial agricultural system in the face of demographic and environmental change” (p. 583). Similarly, in the case of the Parakarungu blacksmith described in this paper, he draws on memories from the knowledge his father passed on to him after the CBNRM projects failed to meet his needs and other subsistence livelihoods like livestock farming collapsed. Drawing on his knowledge of constructing a cost-effective furnace that uses minimal coal and giving due consideration to conserving fuel-wood with the use of an attached fan, he can further be supported with more efficient technology to improve his practice, especially the moulding process of his products. He can share this knowledge through teaching other members of the community and create employment for his fellow villagers. In this way memories of his local knowledge that he acquired from

his father may play important symbolic and developmental rather than subsistence roles where this knowledge can be utilised and applied in other contexts.

However, it is worth noting that sustaining blacksmithing, a skill achieved by destroying trees, is only managing risk, not eliminating it. Therefore, it is necessary for CBNRM schemes to support the blacksmith through more environmentally friendly alternative energy sources such as solar power. Unfortunately, the products of blacksmiths must also be protected against the stiff competition they face from cheaper and neater mass-produced goods from factories, which offers another opportunity for the CBNRM schemes to intervene in order to protect the blacksmith's market.

## 6.0 Conclusion

This study represents the initial step in which stakeholders in CBNRM institutions such as government and NGOs could develop social economic development schemes that are more focussed not only on the general community, say in a village, but on an individual based on his or her personal and social circumstance as he or she attempts to develop coping strategies to the risks and shocks they are subjected to in their natural environment. These initiatives should consider the individual's rights and freedom to make his or her choice of coping strategies acting within the risk context that he finds himself in. This is what Lotz-Sisitka (2010) views as the role of sustainability in relation to the strengthening of social ecological resilience and participation practices with people through deliberating on their valued beings and doings in the context of socio-ecological change and risk. From such doings we can understand the adaptive capacity of individuals and how they mediate, adapt, and learn from the change brought about by their initiatives, for improved and sustainable performance and livelihood (Krasny et al, 2010; Lundholm & Plummer, 2010). Taking this position will be directed towards building people's capabilities and capacities in the face of risks and shocks in their environment without discouraging them from pursuing such valuable initiatives.

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