Incentivising Effective Indigenous Ecosystem Restoration Practices: A Synopsis of PerceptualApproaches to Local Climate Action in the Barotse Cultural Landscape

Abstract

The study was premised on a generic hypothesis that attributes the status quo vis-à-vis increasing ecosystem degradation to communities' stage-managed negligence fueled by the state's decision about sixty years ago to start incentivising, unsustainably though, previously voluntary environmental consciousness and associated actions by the communities.Rural livelihoods are generally threatened by climate impacts, particularly for agrarian and pastoralist communities, like the study area. Although extreme weather events have always been there, the frequency of their occurrence has risen and the exposed populations have been growing.A concise illustration of the conjectures of the study is reflected in the below conceptual framework which traces indigenous knowledge contributions to enabling governance and policy environment anchored on mutual respect, trust and sustainability ideals.The study has established that the status quo vis-à-vis ecosystem degradation and restoration potential is a dual function of trends in the governance systems over the years and perceptional inclinations of local communities in the study area. Further to the apparent indifference exhibited by communities in providing voluntary support and local knowledge, it is recommended that indigenous knowledge should be incentivized just like modern knowledge.

Keywords : Sustainable Development, political independence, terrestrial ecosystems, Ecosystem Restoration

1.0 Introduction

The Sustainable Development Agenda 2030 permeates all United Nations member states and their respective communities. It is an ambitious roadmap that requires realistic attention to key leverage areas as well as inhibiting factors that would translate to success and/or failure respectively in attaining the desired scenarios in all sectors by the target period. This calls for a broadened overview of all possible

ingredients in the success formula. One such dimension to pay special attention to is rural poverty, with its associated signatures of declining local capacity to respond to and cope with theever rising climate change impacts, resulting in high fragility of livelihood systems to mainly weather-induced extreme hydro-meteorological and geophysical events. The question of poverty rising has remained valid to date as indicators point to notable regression.[i]

This paper is therefore a responsive attempt to reveal salient issues inherent within indigenous communities in the context of their latent and observed capacities to contribute to climate mitigation and adaptation efforts towards disaster risk reduction, loss and damage and overall alertness in anticipation of impending extreme events. The study was premised on a generic hypothesis that attributes the status quo vis-à-vis increasing ecosystem degradation to communities' stage-managed negligence fueled by the state's decision about sixty years ago to start incentivising, unsustainably though, previously voluntary environmental consciousness and associated actions by the communities.

1.1 Background to the Study

The study area possesses a unique geopolitical history within the Republic of Zambia which is a former British colony. However, the region encompassing the study area (Barotseland) was not a colony but an autonomous British Protectorate that did not require any independence but elite actors from Barotseland were deeply intertwined in the Northern Rhodesian struggle for political independence from the British towards the creation of an independent state called Zambia. Top among the pre-independence negotiations included the request by the Northern Rhodesia side to have Barotseland joined as an integral part of the new country. The negotiations culminated into a treaty dubbed the Barotseland Agreement 1964 signed in London in May 1964 between Kenneth Kaunda as Prime Minister of Northern Rhodesia and the King of Barotseland Sir Mwanawina Lewanika III, KBE. This treaty paved way for the amalgamation of Northern Rhodesia and Barotseland into a new Republic of Zambia whose official independence was endorsed five months later in October 1964.[ii]

Prior to Barotseland joining Northern Rhodesia and becoming part of Zambia, the Barotse Governance systemrelied exclusively on decentralized indigenous mechanisms of managing natural resources, with every component of the environment covered under the jurisdiction of an Induna (Counselor / Minister). There were Indunas responsible for managing the terrestrial ecosystems, mainly forests, others were for aquatic ecosystems, including waterways and various water sources and their use, others were for livestock, wildlife, hunting permits whereas public works were also under specific Induna's office and labour was 100% voluntarily provided as an honourable duty for a citizen to contribute to improving any situation they are called in to.[iii]

In view of the scenario described above, all public works and assets, natural and man-made, received regular maintenance and kept in their optimum standard for the provision of public goods and services. However, this management mechanism was curtailed at the forming of a unitary state called Zambia as the central government usurped what were previously local voluntary responsibilities with promises of monetary incentives for previously voluntary duties. Local Government Authorities (Councils) under the new republic were charged with the responsibility to provide the services that were previously a voluntary preserve of the decentralized local structures of the Barotse indigenous governance system.This was a development that could be attributed to neo-colonial influences thatinadvertently served to undermine indigenous systems.

1.2 Statement of the Problem

Rural livelihoods are generally threatened by climate impacts, particularly for agrarian and pastoralist communities, like the study area. Although extreme weather events have always been there, the frequency of their occurrence has risen and the exposed populations have been growing. This has led to increased loss and damage, a scenario that retards local development, sending many exposed households into adopting negative coping mechanisms. These coping mechanisms, in turn, worsen the already overwhelmed and stressed ecosystems, undermining their replenishment capacity and expediting the rate of their degradation. Degraded ecosystems lose their ability to insulate exposed livelihoods from extreme weather-induced events, leading to more losses, reduced yields, reduced household income, and household food insecurity and widening physical, social, and economic vulnerabilities. This is why there is a noted regression in the performance of SDG 1 on ending poverty despite notable progress in SDG 9 where an increase in research and development spending has been observed as per the 2023 global sustainable development report.[iv]

The most probable remedy to the scenario above is ecosystem restoration which, for the study area, was uncalled for in the past as the ecosystems were sustainably managed by the locals and never went anywhere near degradation. For now, it is a warranted concern that calls for immediate restoration efforts. Both the authorities and communities know what exactly needs to be done and each side holds back its expectations. Communities who are directly negatively impacted by the status quo expect authorities (government) to intervene and authorities expect communities to do what is possible within their capacities to remediate the situation.

Considering the indigenous knowledge of local communities derived from centuries of prudent ecosystem management and restoration, knowledge, practices and skills that have been passed down to successive generations, it is most likely that the contemporary local communities are endowed with necessary knowledge and techniques to restore degraded ecosystems for enhancing ecosystem services and improved livelihoods. What is making communities not activating their inherent indigenous knowledge and skills to restore their essential degraded ecosystems require skillful interrogation. This constitutes a gap in knowledge to help us understand what really the issues at stake are so as to find both reactive and proactive mechanisms for redress and further curtailing the recurrence of what brought about the status quo vis-à-vis ecosystem degradation.

1.3 Rationale of the Study

The study was premised on the need to unveil the intricate relationship between public policy direction and public perception in order to reveal a case for remedying any undesirable outcomes of such relationships. Generally, the study sought to explain away the local communities' apparent indifference to observable degradation of the ecosystems they rely on for their livelihoods despite their situations worsening over the years on account on the status of the ecosystems. A study like this helps relevant stakeholders to review concerned policies as well as devising alternative mechanisms of addressing the drivers of ecosystem degradation and identifying and promoting community-led workable options for remediation.

1.4 Objectives of the Study

The study had three specific objectives which were:

i. To find out indigenous aquatic ecosystem restoration mechanisms employed in the past by communities in the study area;
ii. To find out the factors accountable for the communities' apparent failure to deploy the same restoration mechanisms that were used in the past;
iii. To explore alternative mechanisms, in the context of the status quo, of ensuring ecosystem restoration is activated and sustainably embraced in the study area.

1.5 Research Questions

i. What indigenous aquatic ecosystem restoration mechanisms were employed in the past to maintain the systems functional?
ii. Why are communities not employing the same mechanisms that were used in the past to restore and maintain functional ecosystems?
iii. What should be done to ensure the degraded ecosystems are restored and maintained?

1.6 Description of Study Area

The study area was Mabumbu ward, one of the political administrative zones under Mongu Municipal Council that oversees Mongu District which is the administrative capital of Western Province of Zambia or Barotseland as it is historically and locally known. It is also part of the Barotse Cultural Landscape envisaged by UNESCO to be inscribed on its world heritage sites list. It sits in a transition zone between two ecosystems, that is, the terrestrial and aquatic ecosystems. It therefore encounters climate change impacts associated with both ecosystems. It has a population of at least 2,207 people as at the last census of 2022. The main livelihoods are predominantly farming and trading of agro-produce while those with technical skillsets find temporary or permanent jobs in the main town[v].

1.7 Definition of Key Terms

i. Hazard – a potential danger to humans and their welfare
ii. Risk – the probability of hazard occurrence. It denotes the chance factor that a feared hazard would occur
iii. Disaster - a catastrophic situation that undermines society's functional capacity to provide goods and services to its residents, mainly ignited by extreme events that overwhelm societal systems.
iv. Vulnerability - a measure of risk of incurring damage and loss or inconvenience arising from loss of capacity to cope with or effectively respond to external stimuli affecting the social, economic or physical conditions the affected live in
v. Perception – a framework within which local communities interpret phenomena and draw conclusions that influence action or inaction arising thereof.
vi. Restoration – a deliberate process of helping a system retain its lost functionality by undertaking several measures that facilitate such return to normalcy.

1.8 Study Limitations

- Time – owing to the distance from the researcher's residency to the study area which lies over 500 km away and considering other concurrent responsibilities time appeared inadequate to deeply explore the hinterland of the core-study area.
- Accessibility - The timing of the study coincided with seasonal flood regime that curtailed access to areas that were outside the study area but important as they were ecologically linked to the study area.
- Cultural and Societal functions - the study coincided with some important cultural festivities that kept locals readily available but too busy to be held up in lengthy focus group discussions.
- Financial constraints - being a self-sponsored study finances appeared constraining in terms of extension of study period in the field.

Literature Review

2.1 Introduction

This chapter provides a synopsis of documentary perspectives on livelihoods and climate change impacts as well as people's adaptive mechanisms under such scenarios. It traces human perception in the face of climate change from global, regional and local levels and further contextualises such insights to the study area from the perspective of indigenous knowledge systems.

2.2 Indigenous Ecosystem Restoration Practices

The subject of local livelihoods and how they regularly get affected by climate change impacts is a live arena that keeps receiving new but similar insights. What has been lacking, though, is the adequate coverage of the contribution of indigenous knowledge to such issues as climate change response. Yet it is not uncommon to find communities that quietly survive on account of the same indigenous knowledge systems that are seldom included in public discourse. It is, however, worth noting the growing attention to indigenous knowledge systems as their contribution is increasingly being revealed. For instance, a 2019 study by the Instituted of Environment Science and Technology at UniversitatAutonoma de Barcelona observed that ecosystem restoration registered noticeable success when local people are actively involved because it is through them that indigenous knowledge comes to the fore.[vi] This is even more pronounced in disaster risk reduction mechanisms where devising relevant context-specific approaches appears to directly benefit from integration of indigenous knowledge.

There are verifiable cases where indigenous knowledge has proved useful in informing local action because it is described as being interdisciplinary, often drawing insights from a whole system approach.[vii]In disaster risk reduction and early warning systems, for instance, IKS have earned for themselves a reputation for reliability and life-saving practical applications. One of the good examples to illustrate the potency of IKS is that of the Moken people whose capacity to read and interpret animal behavior helped them to predict impending hazardous extreme events like earthquakes and tsunamis.[viii]

This characteristic of indigenous knowledge systems (IKS) provide for local relevance of those key elements that constitute a basis for decision-making and livelihood planning. It is therefore tenable to appreciate the influence of IKS in local level processes, including in the management of natural resources and specifically ecosystems that play a central role in sustaining local socio-economic and cultural lives of the people. This is why even the Sendai Framework for Disaster Risk Reduction acknowledged, among its guiding principles, the value of indigenous knowledge as reflected in principle (g) where its integration is recommended as a necessary compliment to conventional science-based systems.[ix]

In terms of local strategies for ecosystem restoration, a UNEP supported study that covered four African countries established specific sectors where IKS proved useful. These included food security, human and animal health, disaster management, and natural resources and environmental management. The latter encompasses ecosystem restoration. [x] For the study area, indigenous natural resources governance system assigned specific mandate to identified portfolios within the legislative and administrative public administration structures with each sector or resource falling under the jurisdiction of a particular counselor who coordinated local communities in more participatory co-management mechanisms that thrived on voluntary collaboration. Through such mechanisms, indigenous knowledge practices could flourish as each person endowed with unique skills or knowledge had a wide latitude to display such and teach others. A recent demonstration of inert geo-hydrological knowledge of locals emerged during the construction of the road that traversed the Barotse flood plain connecting the two districts of Mongu on the east of the Zambezi River and Kalabo to the west, the first such major structural configuration of the plain. Earlier efforts by contracted Engineers failed as they kept ignoring local people's advice on the multidimensional flow nets of the surface and ground water regimes that created lateral and vertical motions, gradual but consistent enough to dislodge any substructure imposed into the subsurface and cause eventual dislocation of superstructures. The last team of Engineers that hid the advice of the locals succeeded and a beautiful road was finally constructed across the flood plain. [xi]

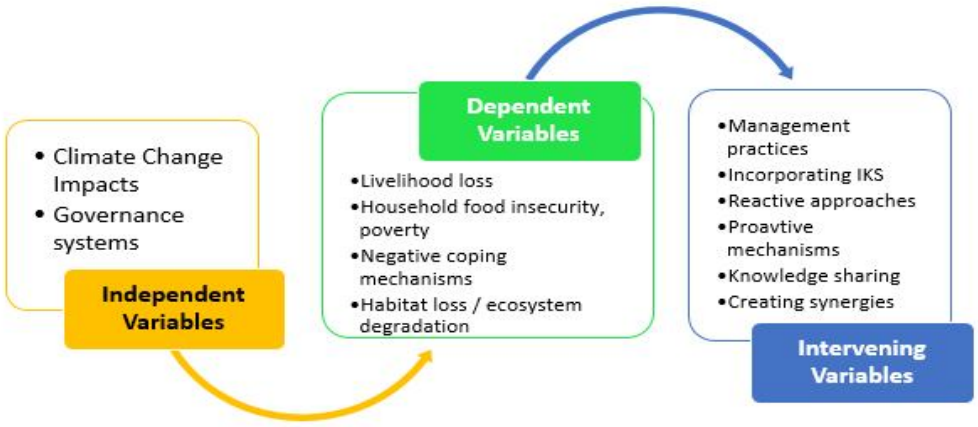
2.3 Theoretical Framework

The question of indigenous knowledge, in any field of practice it is brought in, will often be located within some theoretical underpinnings. This study drew practical insights from the ***Socio-Ecological Model***which has been found more appropriate in disaster management where it provides for an in-depth interrogation of the logical linkages between an individual, community as well as the societal factors that sustain such relationships. A careful review of such relationships unveil the inherent factors that account for exposure to risks and hazards by individuals and communities. The model further attributes the processes devised to champion disaster risk reduction planning, preparedness, response and recovery mechanisms to the said dynamic linkages. [xii]

2.4 Conceptual Framework

A concise illustration of the conjectures of the study is reflected in the below conceptual framework which traces indigenous knowledge contributions to enabling governance and policy environment anchored on mutual respect, trust and sustainability ideals.

Figure 1: Conceptual Framework



The framework highlights climate change and a dominant governance system as overriding variables within which ecosystem restoration mechanisms exist. Any limitations attributed to these variables have a bearing on the exposed communities' livelihoods and their coping capacities. Any deficiencies in coping capacities manifest in the adoption of negative mechanisms that in turn fuel habitat loss and ecosystem degradation. Restoration of degraded ecosystems requires alternative or additional avenues to supplement conventional systems under whose watch ecosystem degradation has been deteriorating. Such alternative mechanisms include the incorporation of IKS. Most importantly, an interrogation into the factors that curtailed local communities from invoking their IKS to save the ecosystems need attention. Thus, the sharing of knowledge with provisions for creating synergies point to incorporating IKS. This was the gist of the study.

Methodology

The study adopted two research approaches namely appreciative inquiry and abductive approaches. Appreciative inquiry seeks to decipher the positive elements embedded in a particular system, that is, what works rather than focusing on its weaknesses. This guided the study in establishing positive influential elements of indigenous systems. Abductive approach, on the other hand, combined the strengths of inductive and deductive approaches to locate the key themes from both hypothetical and evidence dimensions. Qualitative design was chosen owing to the nature of the data that were to be generated for they primarily focused on non-numeral perspectives. This was further informed by ethnographic and phenomenological considerations that helped to capture cultural and lived experiences of the communities.

Non-probability sampling techniques were employed, particularly purposive and convenience. Sample size consisted of 69 respondents accounting for 15.6% of the total households that numbered 441. Respondents were composed of three different categories representing elders, males, females, and youths. Key informant interviews and focus group discussions were used, including non-participant observation that was focused on appreciating visual impressions of land cover change, ecosystem damage and realities of fragile livelihoods attributed to climate change impacts. Thematic and content analyses were employed to generate grounded perspectives reflected herein.

Presentation of Study Findings

This study had three specific objectives the first of which was to identify indigenous aquatic ecosystem restoration mechanisms employed in the past. The second objective sought to find out factors that would explain the communities' apparent indifference or failure to use the same indigenous ecosystem restoration mechanisms that were applied in the past whereas the third objective was focused on devising alternative mechanisms of ensuring ecosystem restoration efforts were activated. The findings presented herein have been arranged in accordance with the above objectives.

4.1 Indigenous Aquatic Ecosystem Restoration Mechanisms

As it is already generally acknowledged, communities that have survived in a particular ecosystem for centuries have nurtured intricate relationships with their host environment and developed mechanisms for mutual survival, taking care of their own interest and that of nature. This explains why they sustainably lived in the same environment without either them or the environment getting undermined. However, this mutual relationship was sabotaged by modern knowledge and its socio-political systems that brought in a monetized centralized governance system that propitiated economic prosperity that has been detrimental to the vitality of ecosystems. The result is the worrisome status quo of continued ecosystem degradation.

Notwithstanding these historical trends, the study sought to identify such indigenous mechanisms communities in the past used to maintain such an ideal relationship with nature that ensured ecosystems flourished as humans derived their livelihoods from them.

At least half (50.72%), that is 35, of the respondents were in the category of elders whose youngest was 71 years old and lived in the study area for at least 54 years. The study purposively targeted those that had lived in the study area for at least 30 years by the time of the study. This was necessary to ensure only those with uninterrupted interaction with their environment for at least three decades, long enough to have observed any major changes in climate patterns, were interfaced with. 29 respondents accounting for 82.86% of the elders' group shared common insights about how ecosystems were prudently managed in the past. It was revealed that ecosystem management was mainly mechanically undertaken in a manner that facilitated ecological functions to flourish. A summary of their perspectives are hereunder outlined.

- Each village conducted regular dredging of the water channels (canals) for the portion of their village land and in each village every farmer drained his portion of the canal adjacent to one's field. This regular maintenance ensured unrestricted water flow and prevented clogging of water or flooding of farming fields. Free flow of water also helped to prevent water borne diseases and sabotaged any possibilities of creating conducive breeding grounds for malaria causing mosquitoes.

- Construction of natural weirs using selected aquatic plant species that helped to retain water in dry seasons. This was used to maintain minimum soil moisture in line with specific crops' soil moisture requirements. The retained water could be allowed to seep gradually for continuous moisture supply into the fields during dry seasons.

- Communal joint operations for public water channels not falling under the jurisdiction of any specific village. The Induna (Counselor) in-charge of water resources management would announce the date and time for the public (men) to assemble at designated points to collectively work on clearing clogged portions of public streams and canals. The works were to be inspected and certified as satisfactory by specialized persons chosen.

- Women from different villages, on the other hand, would prepare food for the men that would have joint meals at work sites. At the same time they would be allowed to follow with their fishing baskets to catch fish in the cleared portions as the dredging works would increase turbidity and drowse the fish. Generally, these works were a preserve for men. Canal portions falling under the voluntary work jurisdiction of single females or elderly males' fields were taken care of by energetic young males.

In summing up the old ways, one key respondent emotionally described what he called the glorious old days as:

'….you guys would never understand how sweet life was when working for ourselves with mother-nature was not only an honour but a duty. Now you have destroyed our lives, our land, our water, our animals, our birds, and our forests. Nature was both our mother who breastfed us and at the same time our workmate. It's really annoying. And you call yourselves educated and modern''.[xiii]

The system described above was responsible for maintaining well-managed ecosystems at no financial cost on anybody. Further, the use of communal resources like rivers, bird sanctuaries, hunting grounds,

grazing areas, lagoons and forests were self-regulated. Some identified wildlife and tree species were prohibited from being harvested and there were no exceptions, unlike under the modern governance systems with its monetized regulations that permit harvesting once one pays for a license. The questions that beg for answers are how this harmonious system was lost and why communities appear not eager to revert to such effective and communal collaborative efforts. Section 4.2 below attempts to provide some explanations.

4.2 Factors Explaining Community Failure to Use Indigenous Ecosystem Restoration Mechanisms

What the locals described as the glorious old days enjoyed by earlier communities was long gone. They approximate the period of the demise of their effective indigenous systems to around 1969, five years after Zambia gained her political independence from the British. The year 1969 appears to be vividlyremembered because according to the local old folk it was the year the then Zambian President Kenneth Kaunda unilaterally abrogated the Barotseland Agreement 1964 and initiated legislative mechanisms that eroded the authority and legitimacy of the Barotse indigenous systems. The government went further to introduce and strengthen a generic Local Government system applicable countrywide through the operation of District Councils which, for Barotseland, were made to absorb the functions of the indigenous systems.

The new Councils were manned by salaried technical staff and they were charged with the responsibility, among others, of providing services and carrying out functions that were previously voluntarily provided by locals under indigenous systems. People were advised their caring government would take up such functions through the Councils and they no longer needed to labour freely as before. This view was strongly held by 71% of the respondents whereas 29% argued that while it was true that the Zambian government destroyed the once effective indigenous systems it was no longer justifiable to keep pointing fingers at the government and its failed systems when the people could still reinvigorate their old working systems. Among the reasons cited by a few from among the 29% for their position was the national decentralisation policy which the government adopted because the policy is locally-inclined as it recognizes the power of the people. They felt the policy environment was conducive enough for people to take charge of their local issues, particularly development.

In an effort to decipher the underlying factors accountable for the apparent failure to make the old systems work again in the face of accusations against the government systems, the following is a summary of the issues raised by the respondents.

Table 1: Underlying factors for community indifference to revitalizing indigenous systems

SN	Underlying Factors	Frequency	%
1	Government has money for labour	30	43.5
2	Government gives out contracts to private sector to do the works but they disappear after being paid, so if we do the work freely someone will be paid for our free labour in form of a contract.	20	29.0
3	We spend nearly all our time looking for food, no time to spare for works that are not directly related to putting immediate food on the table	17	24.6
4	Changes in land tenure systems where anybody with money can buy even family land depriving the owners	2	2.9
TOTAL		**69**	**100**

As indicated in the above table the notion that government has money to procure labour for ecosystem restoration efforts was held by the majority (43.5%) of the respondents, particularly among the elderly. This appears to be derived from the promises made by the government shortly after political independence and the old folk still holds government accountable for its voluntary pledge. The other notable factor strongly held by 20% of the respondents, predominantly the youthful cohort, was that of contract management modalities of outsourcing the services of private sector players to undertake public works. They made reference to instances where works had been tendered and contract awarded to a contractor who would get paid but either abandons incomplete works or does shoddy works. They argue that if they used their initiatives to help do the work the contractors with connections in government would walk away with hefty payments for their free labour. And lastly, a sizeable number of respondents accounting for 24.6% attributed their indifference to household food insecurity and poverty, a scenario that compelled them to dedicate their time and energies to looking for food to feed their families since their farming efforts could no longer provide them with enough food like it used to be in the past. They further blamed their poor yields to changes in nature (climate change impacts) leading to prolonged dry spells and prolonged inundation of fields due to non-maintenance of canals.

Generally, only two factors have come out strongly from community perspectives and these are expectations for government to provide financial and material support to undertake ecosystem restoration works they used to voluntarily provide before. These expectations were openly created in the people by government. Secondly, the rising poverty levels and the almost perennial household food insecurity. The second reasons is both a driver and a consequence of ecosystem degradation as poverty and climate-induced food insecurity directs people to adopting negative coping mechanisms that fuel ecosystem degradation. This is a viscous cycle that requires strategic mechanisms to break. The next section, 4.3., is attempting to address this concern.

4.3 Exploration of Alternative Mechanisms toIncentivising Indigenous Ecosystem Restoration

The challenges associated with continued ecosystem degradation and the call for restoration are not new. The government has provided clear policy guidelines that point to the resolve to seriously consider ecosystem restoration as communities strive for survival. For instance, the Ministry of Agriculture adopted Ecosystem-based Adaptation (EbA) as an approach that is restoration-inclined. Among the notable policy and legislative provisions that would be described as proactive in augmenting ecosystem restoration efforts are as follows:

4.3.1 Constituency Development Fund (CDF) Climate Action

The Government of the Republic of Zambia enacted the Constituency Development Fund (CDF) Act No. 11 of 2018 and revised it to Act No. 1 of 2024 to provide for the fund that should be used for addressing locally driven development aspirations. Part II section 5 of this Act establishes the CDF committees consisting largely of local residents in the administrative jurisdiction for which the fund applies whereas section 6 stipulates the functions of the committees and an outline of local projects' processing procedures. These sections have awarded considerable powers to the local level, a provision that can be leveraged for incorporating indigenous knowledge as all inputs are envisaged to be community driven[xiv].

This facility is a potentially promising vehicle by which to imbed incentives targeted at igniting local ingenuity in ecosystem restoration approaches especially that among the recommended projects are those to do with disaster risk reduction, resilience to climate change impacts, water for production purposes as well as food security and livelihoods[xv]. In view of the above, it became necessary to interrogate community perspectives regarding the opportunities provided by the CDF. Respondents affirmed the potentials of CDF and expressed gratitude for government's resolve to allocate significant amounts to the

fund compared to the past regimes. The current administration raised CDF allocation to approximately US$1,140,000 per constituency from the previous US$80,000[xvi].

The positive accolades were, however, met with pessimism derived from the observed access bottlenecks carefully woven within the fund administration processes resulting in many applicants failing the eligibility requirements. For instance 19, accounting for 27.5% of the respondents, bemoaned the requirement to access the fund through forming cooperatives, claiming that groups formed haphazardly for the purpose of accessing funds but not anchored on a common agenda are bound to fail if at all they access such funds because each one has their own priorities and reaching consensus is problematic. One of these respondents argued that:

'…they tell us to form cooperatives so that we access the money and use it together. Now, us we are farmers and each one has his or her own personal land in our different Villages. How do we work together when do not share a common piece of land? They should have Allowed even individuals that have good plans to get this help and improve their condition and eventually help others. Otherwise CDF can be a game changer if it is appropriately administered…'

From the general views of the respondents CDF is the most happening facility that both government and locals can leverage on to incentivize ecosystem restoration and once they are restored indigenous governance systems could be encouraged to augment such efforts for sustainability.

4.3.2 Disaster Management Act – Disaster Trust Fund

The Disaster Management Act No. 13 of 2010 provides, under Part V section 30 (1), for the National Disaster Relief Trust Fund including the mechanisms of funding this facility and utilisation of the funds as stipulated in sections 30 (2) and 32 respectively[xvii]. This fund is envisaged to be applied for disaster preparedness and response interventions. Preparedness activities are more inclined to risk reduction which encompasses ecosystem restoration. This is another potentially effective modality of providing strategic incentives for specific interventions by communities. By the time of the study, this fund was not yet activated or operationalised. It, however, remains a worth alternative to pilot. It can to a large extent answer to some of the expectations expressed by communities through the respondents that government should consider deliberate interventions to cushion the burden on local populations in their efforts to remedy the observable climate change impacts like habitat loss and continued deterioration of ecosystems that are a backbone for their livelihoods.

4.3.3 Urban and Regional Planning Act

Another enabling legislation is the Urban and Regional Planning Act No. 3 of 2015. Of direct relevance to the subject of discussion are sections 13(1) and subsection 2(b) and section 19(1) which compel Local Authorities to prepared Integrated Development Plans (IDPs). Further, sections 20(1) and 20(2)(a) call for surveys to inform planning processes and explicitly demand that evidence of the process having involved locals and final product informed by local priorities are critical to appreciating the extent to which this planning legislation is locally-inclined. This is yet another legislation that have provided compelling opportunities for locals to champion their aspirations in government plans. The reported complaints of having inaudible voices can ably be remedied by these provisions if they are to be complied with by planning authorities. In addition, the Local Government Act has also bestowed upon Local Authorities over sixty statutory and delegated functions some of which cover environmental management and climate change, areas that encompass ecosystem restoration.

4.3.5 Multi-stakeholders Coordination Forum

A combined force of state and non-state actors operating in a well-coordinated fashion premised on shared aspirations can help to lubricate obstacles associated with acting in silos when addressing almost similar challenges. Since the mandate of government is crosscutting in all sectors through specific ministerial or departmental mandate holders, non-state actors can align with state agencies whose mandate is of direct relevance to the non-state actor's focus areas. This synergy can bring resources and expertise together for impactful interventions. Communities would eventually benefit in real terms. Other than complaints against government's negligible attention to local thorny issues, 15.9% (11) of the respondents registered concern on account of absence of non-state actors like NGOs in their area that would have helped where government fails.

4.3.6 Food for Assets Initiative

The most vivid option that the majority 53 (76.8%) of the respondents strongly demanded was what the author would summarise as Food for Assets. This is a mechanism where government or any other non-state actor would provide food to food insecure households where energetic members of such households would provide labour in ecosystem restoration interventions. The respondents alluded to past experiences where government would make staple food available to those that would avail themselves for public works can dredging of drainage channels or construction of weirs or fire breaks.

4.3.7 Incentivised Livelihood and Ecosystem Restoration Initiatives

The options suggested above appear effective especially in lean periods when most households are food insecure. Notwithstanding the above, the study deduces from a plurality of responses that a deliberate initiative to incentivize local engagement and application of indigenous knowledge practices and skills in aquatic ecosystem restoration is necessary. This is premised on the observation that the above mentioned opportunities have been there but they have not been taken advantage of. As such respondents were asked about what they thought would ignite local interest to apply their local knowledge. A proportion of 42%, that is, 29, of the respondents argued that awarding personal effort would be more effective where external support should be based on an individual's willingness or verified seriousness to be measured by what someone has done at his portion of the canal. That is, if person A has shown efforts to protect to canal section of his land then he can qualify to receive external support. They strongly believed this would entice everybody to do their best individually, a scenario that is likely to produce common goodness for the benefits of the entire community and nature.

5.0 Conclusion and Recommendations

5.1 Conclusion

The study has established that the status quo vis-à-vis ecosystem degradation and restoration potential is a dual function of trends in the governance systems over the years and perceptional inclinations of local communities in the study area. Personal accounts of senior citizens who lived in the study area for at least three consecutive decades and those that have been there from pre-independence era could attest to some effective indigenous natural resources/ ecosystem management systems they employed in the past which could also work in the present.

It has further been ascertained that the monetization of previously voluntary public duty eroded the pride that was derived from freely contributing to the betterment of conditions in one's locality. The profiteering motive has become almost the sole motivation for engaging in any community work even if the work is meant to directly benefit the same people. This is partially held as a decision-making accountability viewpoint where individuals vying for elective public office, especially in the legislature

and executive would voluntarily commit themselves to making certain things happen that would address people's aspirations. And people would expectedthat to be fulfilled.

Thirdly and lastly, the study has outlined some potentially workable modalities of incentivising community-based ecosystem restoration. A large number of the modalities are already provided for in the cited legislations. Their activation, however, calls for decisive and proactive interventions.

5.2 Recommendations

Owing to the key findings around the three specific objectives of the study, it is hereby recommended that;

i. Deliberate efforts to explicitly include disclosure of any indigenous knowledge skills and practices by communities among the criteria for such communities receiving external support and such provisions for indigenous knowledge should be incorporated in existing policies and legislations;

ii. Further to the apparent indifference exhibited by communities in providing voluntary support and local knowledge, it is recommended that indigenous knowledge should be incentivized just like modern knowledge. To augment local willingness but not necessarily to over monetize local operations, all projects for local interventions be awarded to groups of locals, formally registered or not, if such groups have empirical evidence showcasing their competences and reliability.

iii. Additional alternatives be explored and identified modalities of incentivising ecosystem restoration be piloted to ascertain their effectiveness and for drawing lessons.

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