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Community Readiness for Climate Change Adaptation and Mitigation Initiatives: A Case of Yovi Hydropower Project in Kilosa District, Morogoro - Tanzania

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Authors' contributions

This work was carried out in collaboration between both authors. Authors BT and JK designed the study, wrote a protocol and prepared the final manuscript. In particular author BT conducted the study, performed the statistical analysis and prepared the draft manuscript, while author JK supervised the study and play major role in data interpretations and discussions. Both authors read and approved the final manuscript.

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ABSTRACT

The purpose of this study was to investigate the feasibility of engaging rural communities in the process of institutionalizing climate change adaptation and mitigation initiatives: focusing on the process of engagement and communication and learning the rational and emotional commitment of people in the community to the issues of renewable energy.

The study was conducted for four weeks in three villages surrounding Yovi Mini Hydropower project in Kisanga-Valley ward of Kilosa District. Ninety (90) individuals responded to questionnaires, and ten (10) key stakeholders at village, district and national levels were

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interviewed. Based on grounded theory, the study utilized qualitative method and techniques to design, collect and analyze the data.
The study findings revealed community members around Yovi hydropower project, were more informed than engaged during the institutionalization of the hydropower project. While the Project proponents were successful with communicating about the project to the villagers through their district and village leaders, there were insufficient platforms and required capacities for these leaders to effectively engage with citizens. Moreover, the information from surveys suggests that the notable setback in climate change mitigation and adaption initiatives is due to failure to engage adequately communities to understand the core purpose of the project in their own terms, and later influence some aspects of it.
These study findings raised a critical question on '*what was* the purpose of engaging community people to institutionalize climate change in this hydropower project, if their voices are not actually heard and used to determine the solutions and actions? As a start, the study provides framework to link communication and public engagement in the climate change mitigation and initiatives.

Keywords: Climate change adaptation; climate change mitigation; engagement; communication; project institutionalization; Tanzania.

1. BACKGROUND AND PURPOSE

The Yovi Mini Hydropower Project was developed to generate a total of 995-1500 KW of electricity, to benefit 200 households, public and private facilities within three villages of Kisanga Valley. Generating electricity from renewable sources is expected to minimize the use of fossil fuels and encourage green adaptation activities for development in the Valley. In order to attain the project objectives, community participation in this hydropower project was considered as a key strategy in the process of institutionalizing the project. The study intended to explore state and degree in which people were involved in planning and implementing the Yovi Mini Hydropower project, as one of the attempts to establish empirical evidence to link between communication and engagement in climate change adaptation and mitigation initiatives in the country.

1.1 Realities of Public Engagement in Tanzania

The Government of Tanzania [1] over decade has undertaken various initiatives at national and sub national levels in a response to climate change. Nonetheless, the information available in recent studies indicates that people in rural areas have not yet developed a sense of ownership and long-term commitment to strengthen and sustain climate change related programs in their respective communities [2,3]. Passive participation and failure to use effective communication are ascribed to intertwine factors that can hold back the success of climate change initiatives. [4]. The "ready-made" recipes of telling people what they should or should not do to improve their livelihoods and protect the environment has been limiting individual capacities to take ownership and sustain development projects at both national and sub-national levels [5]. Ignoring the local context often creates dissonance between the results anticipated by the designers of the projects and the reality on ground [6].

1.2 Project Engagement Approach

Scholars [7,8,9] have highlighted two conceptual approaches that are commonly used in public engagement in the institutionalization most development projects at the community level. These are: participation and modernization.

The participatory approach involves people in defining their contexts, the nature of required interventions and what actions are needed to implement the intended development goals. The modernization approach is a top-down approach whereby the project proponent provides information to induce change in the community or persuade people to adopt predetermined behavioral and attitudinal patterns. Critical understanding of the context prior to the design of a project is the key principle in these two approaches; but each model applies differently [7,8]. In the participatory approach, the community is a construction of various realities and should be looked holistically to realize development goal. It is necessary in this approach that the initiator becomes a part of the community to explore the underlying meanings through observation and listening to identify needs and options, which provide the basis for

intervention [7-9]. In the modernization approach, however, the community is characterized in a single reality of a problem [7]. On the other hand, in the modernization approach the initiator is an impartial and outsider whose role is to gather factual data about the community problem, as much it is required by the project design [7].

1.3 Public Understanding of Science (PUOS) Model

The Public Understanding of Science (PUOS) framework comprises of four elements including, deficit, contextual, lay expertise and public engagement.

The deficit framework is based on linear way of transmitting information from the experts to the target audience that has paucity of knowledge of the subject matter. In the same vain, Sturgis and Allum believe that when the knowledge gap is minimized, community people should respond more readily to any given initiative [10]. This implies that information plays a key role in shaping attitude or changing behavior of a target group [10]. However, Lewenstein and Brossard have found no correlation between participants' level of understanding and their responses to adaptation [11]. According to Lewenstein and Brossard information should function within a specific context, another unit of PUOS. Thus, application of information focuses on individuals' psychological components within their complex social setting. This is to say that individuals process information through their experience, cultural context, and personal circumstances [11]. The downside of this hypothesis is the fact that it confines people within a given situation as if individuals cannot think beyond their socioeconomic and cultural contexts [12].

Lewenstein and Brossard introduces lay expertise aspect in PUOS to explain that individuals are in the living communities and have inherited traditional practices, norms, values, cultural heritage and legacies that are used to solve communal, family and individual problems. It implies that individuals may find "climate change" a new term but have experience and stories how to handle similar threat locally. Secko [13] virulently attack lay expertise, saying it too narrow to cover complexity of modern scientific debates because it places emphasis on local knowledge at the expense of scientific evidence. Nonetheless, Lewenstein and Brossard argue back and postulate that both layperson and expert need to work together in address a societal problem. This is where public engagement comes into a play to actively involve community in problem identification and solving [14]. Public engagement creates a link between the problem and social conditions [??] and shifts control and ownership to people through capacity building and communication [16]. However, the practicality of the public engagement model has been criticized that the model focuses on the process and not on substantive content to improve public understanding [17].

As noted above, several communication approaches work are integrated to produce desired results or behaviors. PUOS is an attempt to address the most common failure of communication in climate change initiatives — to reach the community people by simply providing information from the top through various media [18]. No one is a sole sender or receiver in a solving climate change issues [19]. Through dialogues, building consensus, creating consciousness, raising voice of voiceless, exchanging ideas and exploring new meanings, the climate change initiatives will be localized and allows mutual understanding and collective actions of all actors involved [20].

The extant literature provided framework of this study to examine:

- Who was the major player in engaging people and what was the motivation behind the need to engage the community?
- What kinds of groups were involved at village and district levels and how were they involved?
- What was the context in which communication took place, and how was it utilized as the means of engagement in terms of packaging?

2. METHODOLOGY

2.1 Study Design and Approach

The study was conceptualized into phenomenological approach to describe the community engagement in initiating and implementing the hydropower project that is intended to reduce climate change impacts in the communities of Kisanga ward in Kilosa District. In this case, the qualitative paradigm was found to be the most appropriate to use as it provide a

holistic and detail accounts to reflect the opinions and views of the people living in a given context [21].

The study took place in Msolwa, Kisanga, and Mlulu Villages of Kisanga-Valley Ward in Kilosa District Council in Morogoro region, Tanzania. The district has a long history of deforestation caused by bushfires, forest-clearing for agriculture production, timber production, charcoal production extraction of biomass for energy consumption and partly as a result of increasing urbanization and population growth [25]. These activities coupled with various natural disasters including drought and excessive rains (El Nino), often leave district residents vulnerable with respect to food security, health and incomes as well as property and assets ownership [26]. This district seemed a better ground to study how people in these communities were engaged in the renewable energy project to build community resilience to the impacts of climate change.

2.2 Sample Size and Data Collection

The total population of the study area as per census of 2012 is approximately 27,336 divided amongst 6,834 households. The study used extreme or deviant methodology [22] to select specific respondents who were exposed to the project from the time it was initiated to participate in this study. These respondents had enough experience and memory of the community engagement process used from the time of institutionalization of the project. Case sampling was used to form criteria for identification of individuals who represent a total population [22]. The respondents in this study were all above 18 years of age and comprising various population groups such as youth, women, farmers, entrepreneurs and pastoralists. Categories were also set up for participants with higher than primary level education and in occupations other than farming or livestock keeping. The study ensured a fairly representation of women and men, since it is believed that climate change has a greater negative impact on women than on men [23].

The survey was conducted among 100 multiple respondents selected from three villages intended to benefit from the Yovi Mini Hydropower plant. The survey was governed by semi-structured questionnaires to 90 respondents at household's level. In-depth interviews to 10 respondents including project managers, local authorities, village administrative leaders and civic leaders to obtained a deeper and factual understanding of the process of engaging people. Open-ended questions were asked to uncover participants' thoughts, their knowledge of and experience with the hydropower project, as well as other adaptation and mitigation measures to address the changing climate.

3. RESULTS AND DISCUSSION

3.1 The Outlook of Rural Community Engagement

One of the major key findings of the study is that community peoples were more informed about the Yovi hydropower project than they were engaged to internalized, apply and own the climate adaptation and mitigation measures attached to Fig. 1. shows that more than three quarters (79%) of respondents were capable of labeling intended benefits from of the hydropower project, all related to other social – economic outcomes apart from climate change adaptation and mitigation and the remaining 21% were unable to mention benefits of the project. None of the respondents could directly link the climate change adaptation and mitigation measures benefits attached to the hydropower project.

The evidence from communities visited indicated that the project managers were at least able to communicate with community member through their opinion leaders. However, at the village level there were no clear platforms available to the community to communicate, share information, and dialogue about the project amongst themselves or provide feedback to their leaders and protect managers. The majority of respondents (82%) revealed that key players to engage community members were mostly village leaders who informed the community members about the benefits of hydropower project and decisions made at high levels of Government. Fifteen Percent (15%) of respondents indicated that experts visited these communities, i.e. the District Environmental Officer, the Project implementation team, and technical staff from Rural Electrification Agency (REA) and Tanzania Electricity Supply Company (TANESCO). Only 3% of respondents noted that there was an interaction among community members.

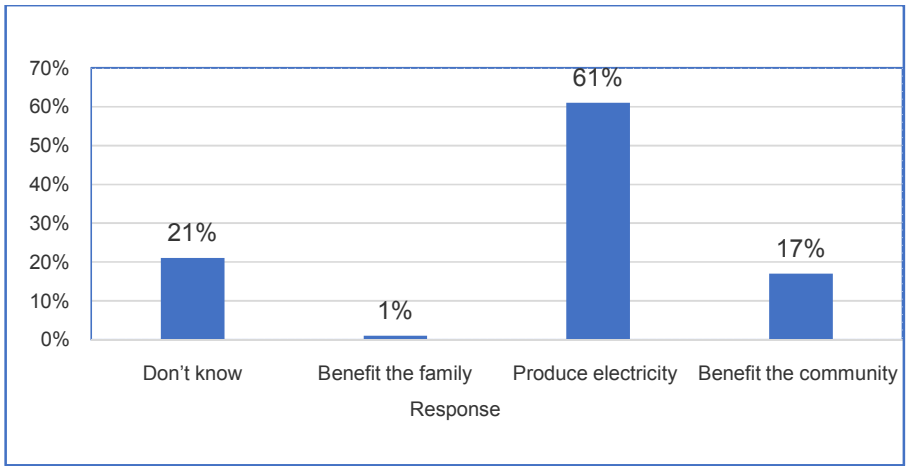

Fig. 1. Benefits of hydropower project as defined by respondents
Source: household survey, 2016

Another finding stood out from the study villages is that communities were not initially reached for the purposes of their engaging aiming to create active dialogue that would enable them link the project with individual and environmental needs. The data in Table 1 shows that the majority (70%) of community members from Msolwa village indicated, they were approached simply to solicit manpower, more than 75% of all respondents from Mululu (where the plant has been installed) reported that they were approached for purposes of seeking villagers' permission and consent to use their community land. In Kisanga village, the majority (88%) of respondents mentioned that they were approached at the initial project stage with an emphasis on the benefits the project, specifically the availability of electricity.

The results from the survey (Table 1) are consistent with data obtained from the in-depth interviews. The leaders at all levels of project management agreed that understanding the culture, interest and needs of the community was not the core purpose when the village leaders were contacted during the initial stage of the project. According to key informants, project documents were already prepared and approved by the relevant Government bodies. A senior project manager said:

> "*The idea at the initial stage in this regard was to secure the permission from community residents on land, mobilize the local labor and solicit the buy-in of key leaders at the district and village levels. We also wanted the villagers to know about the project and how it could benefit them. From the project management standpoint, this was important so that we could avoid potential conflict with the community members. In addition, the feasibility study conducted had an objective of fulfilling the donor's requirements and government regulations.*"

Regarding selection of community representatives in meetings related to designing and planning of the hydropower project, the assessment shows that half (52%) of all respondents did not know how community representatives were selected, followed by 31% who reported that the village leaders simply selected individuals from amongst themselves, from their respective families or friends. Only, 17% of all respondents mentioned that councilor (who originally lobbied for this project to be in the community) nominated individuals who represented community members.

The analysis of the interview with the village leaders revealed that they were only required to collect views of the community members with regard to the specific agenda presented by the project management. Their role at the beginning of the project was to mobilize villagers to attend project meetings, inform them about the decisions already-made on the starting dates, compensation procedures and what the communities expect to get in exchange for their community resources, such as water and land used by the project. According to village leaders met, in these initial meetings the villagers were also informed about the central and local Government's agreement and decision to allow

Table 1. Respondents' opinions on motive behind project introduction during planning stage

Response	Village		
	Msolwa (n=30)	Kisanga (n=32)	Mululu (n=28)
To solicit labor	70.0	56.3	42.9
To acquire land	73.3	68.8	85.7
To get consent on the use community resources	66.7	75.0	78.6
To involve community in dialogue	33.3	56.3	35.7
To inform community on the use of electricity	66.7	87.5	57.1

Source: Households survey, 2016

the project implementers to go ahead with the project plan that was presented to them. Key informant's interviews revealed that inadequate attention was given to educating the people about the fact that the project was a response to climate change or on how they could become actively involved, and own the project.

3.2 Discussion

According to the available data and the assessment of responses on the survey questions, community members were not fully engaged with the project, leading to limited ownership of climate adaptation and mitigation measures attached to the hydropower project. The assessment shows that village leaders and project officers spent time in "selling" the project rather than involving people and creating dialogue to help all stakeholders understand the existing related communities' problems and the environmental issues that the project was intended to address. Contrary to the rules of engagement, which require leaders to identify and empower village animators to mobilize the communities. Although the village leaders become the main champions in the project institutionalization, they had limited capacity to address issues related to climate change. There was less evidence to support the active involvement of influential leaders and peer groups in mobilizing villagers to discuss the project and its linkages with the realities of social and environmental needs.

It implies that the deficit approach was used to ensure community people, particularly village have enough information about the project. The study agrees with Sturgies and Allum [10] that communication in climate change used deficit approach to provide information to increase understanding, hoping that the vulnerable community would respond positively the suggested adaptation and mitigation measures.

A consequence of this is seen in community members receiving distorted understanding that is contrary to its core purpose of the project. The reason being conflicting motives right from the onset; the institutionalization was geared towards promoting the community acceptance of the imposed requirements by the decision-makers and donors for endorsing the project. The fact that the communities were manipulated to affirm with the goals of the project bearers; it is fair to argue that in this case study modernization approach [7] was used to institutionalize the project. Modernization approach usually uses persuasion and marketing techniques to change target audience on one particular issue in the same vain. As a result of using modernization approach, the community in this project was led to focusing on a single issue – the lack of electricity – rather than seizing the opportunity to involve many more actors and citizens in project conceptualization and identify of a range of development and climate change related problems, and tailor solutions to address them appropriately.

4. CONCLUSION

The study looked at the process of community engagement and how this has helped the people of the area impacted by the Yovi Mini Hydropower project understand and respond to climate change adaption and mitigation, as stipulated in the purpose and goals of the project. Because of weak community engagement during the institutionalization of the project, community members remain unable to relate the project to the climate change adaptation and mitigation-related issues. This raises a practical question as what is importance of introducing a climate change related project if it fails to help community members recognize and accept that climate mitigation and adaptation measures is

one of their daily responsibility. A true and effective community engagement is critical for the success of climate change adaptation and mitigation initiatives. Community members must not be regarded merely as targets to be used for demonstrating purposes or to fulfill the ambitions of the proponents; but as experienced and knowledgeable about the context, the environment and conditions in which they live. Therefore, it is incumbent in institutionalizing climate change related projects at community level to listen to the concerns of the people who are directly impacted, enforce good governance, encourage them to own the process and sustain the project activities.

5. FUTURE SCOPE OF WORK

In this study, the use of local knowledge was inadequately explored in institutionalizing this hydropower project as a climate change initiative. Another study would be beneficial to increase understanding of the various elements of local knowledge relevant to renewable energy.

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COMPETING INTERESTS

Authors have declared that no competing interest exists.

REFERENCES

1. United Republic of Tanzania. National Adaptation Program of Action (NAPA) Document. Vice President's Office, Division of Environment; 2007.
2. Yanda P, Mushi D, Henku Al, Maganga F, Mlinde H, Kateka A, et al. Tanzania National Climate Change Finance Analysis Report; 2013.
   Available:http://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion files/8627.pdf
3. Tanzania Forest Conservation Group. Making REDD work for people and forest in Tanzania: Lessons learnt from participatory forest management in Tanzania; 2009.
4. Moser SC, Pike C. Community engagement on adaptation: Meeting a growing capacity need. In: Urban Climate, Elsevier; 2015.
   Retrieved on March 16, 2016.
5. Crocker DA. Ethics of global development: Agency, capability, and deliberative democracy. Cambridge: Cambridge University Press; 2008.
   Thiam M. It has become customary to discuss Mali while simultaneously ignoring Mali; 2015.
   Available:http://africasacountry.com/2015/12/a-malian-state-of-mind/
   (Retrieved on March 16, 2016)
6. Mefalopulos P. Broadening the boundaries of communication. Development Communication Sourcebook Washington, DC: The World Bank; 2008.
7. Quarry W, Remirez R. Communication for another development: Listening before Telling. New York: Zed Books; 2009.
8. Naidoo L. The participatory development communication approach of THUSONG Service Centers in TSHWANE. 13194429; Dissertation submitted in fulfilment of the requirements for the degree Master of Arts in Communication Studies at Potchefstroom Campus of the North-West University, South Africa; 2010.
9. Sturgis P, Allum N. Science in society: Re-evaluating the deficit model of public attitudes. In Public Understanding of Science. 2004;13(1):55–74.
10. Lewenstein BV, Brossard D. Assessing models of public understanding in ELSI outreach materials. Final report. Department of Communication, Cornell University; 2006.
11. Lewenstein BV. Models of public communication of science and technology. Department of communication and of science and technology Studies, Cornell University. New York; 2003.
12. Secko David M. The unfinished science story; reflection on journalist -audience interaction in the online Environmental" Journal of Media Practice; 2009.
13. Hamlett PW. Technology Theory and Deliberative Democracy. Science, Technology and Human Values; 2002.
14. Nisbet MC, Scheufele DA. What's next from science communication? Promising directions and lingering distractions. American Journal of Botany; 2009.
15. Moser SC, Pike C. Community engagement on adaptation: Meeting a

growing capacity need. In: Urban Climate, 2015 – Elsevier.
Retrieved on March 16, 2016

16. Secko DM, Amend E, Friday T. Four models of science of journalism: A synthesis and Practical Assessment. Journalism Practice. Taylor and Francis Group. 2013;7(1):62-80.
17. Kalugendo J, MacLeod P. Creating a participatory communication model for engagement of local communities to enhance development effectiveness in Tanzania. In African Journal of Communication. 2013;105-130.
18. Hammond J, Shackley S. Towards a public communication and engagement strategy for carbon dioxide capture and storage projects in Scotland. Working Paper SCCS; A review of Research Finding, CCS project experiences, Tools, Resources and Best Practices; 2010.
19. Creswell JW. Research design: A qualitative, quantitative, and mixed method approaches. Los Angeles: SAGE Publications; 2014.
20. TRESS Consult Tanzania Limited. Feasibility study on Hydropower Project located along Yovi River in Msolwa Village, Kilosa District, Morogoro Region. Prepared for St Gaspar Secondary School in Msolwa, Kilosa District, Morogoro, Tanzania; 2011.
21. United Republic of Tanzania (URT). Kilosa District Profile. District Executive Director Office, Kilosa, Morogoro; 2010.
22. Teddlie C, Yu F. Mixed methods sampling: A typology with examples. In: Journal of Mixed Methods Research. 2007;1(7):77-100.
23. UN WomenWatch. Fact sheet, women, gender equality and climate change; 2009. Available:http://www.un.org/womenwatch/feature/climate_change/

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