



Original article

Stakeholder Participation in Sustainable Rural Livelihoods Adaptation Strategies in Jotsholo, Lupane District, Zimbabwe

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Abstract

Participation of stakeholders in sustainable rural livelihoods adaptation strategies to climate change is important around the globe. It is worth noting that active involvement in rural livelihoods typically increases resilience and sustainability, given the adverse climatic conditions in the world. The basis of this paper was to analyze the efficacy of sustainable rural livelihood strategies for stakeholders in Jotsholo, District Lupane. The study was conducted in Jotsholo, Lupane district, a region with a high temperature of 22 - 30°C and irregular precipitation of an average of 350 mm a year. In order to collect key information on stakeholders' engagement in sustainable rural life strategies in Jotsholo, Lupane District, between January 2020 and August 2020, the researcher used questionnaires, interviews and focus group discussions (FGDs). The findings of the study reflect that in the case of Jotsholo, generally the roles are effective to a limited extent as there is no timeframe for their execution and they are resource constrained. Non – Governmental Organisations play an important role as they offer support ranging from training in climate change and adaptation to other material donations which tend not to be sustainable though as the stakeholders relax and wait for the donor to lead the way. In order to ensure sustainable adaptation to climate change and variability, there is need to strengthen alliances and partnerships between Government, NGOs, private sector and local communities. Climate governance in Zimbabwe should therefore regard all stakeholders from a grassroots point of view meaningfully and sustainable if close cooperation is adapted.

Keywords: Stakeholder, Participation, Sustainable, Rural Livelihoods, Adaptation.

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INTRODUCTION

The engagement of stakeholders in climate adaptation worldwide is crucial (Elia et al., 2014; Adekalu, 2017; FAO, 2017). It should be noted that active involvement typically contributes to the resilience and survival of rural livelihoods in the face of global adverse climatic conditions. Stakeholders intervene to investigate and to promote the reduction or alleviation of community problems (Davies, 2015; Chazovachii, 2013). Ayele (2018) points to a profound need to increase and encourage the adaptive capacity of individuals and societies for values, norms and networks which are shared in the sense of social climate change. For comparisons and developments of best practice in the field of current research, the literature on stakeholder involvement in rural livelihoods and climate variability and changes is important.

Svodziwa (2020) argue that 'stakeholders must be truly given a chance to create, discuss and encourage alternative options.' This supports their earlier observation of Article 6 of the 1992 UNFCCC, calling upon all Parties to increase public involvement in response to and effects on climate change. Svodziwa (2015) argue that climate change is a multi-stakeholder and multifaceted agenda with a multi-sectoral orientation. Therefore, it is very important in the research at hand to evaluate the role of stakeholders and their efficacy for climate change and adaptation. The questions explored include; Who are the parties concerned? What are their position in rural livelihoods and climate change?

Statement of the Problem

Panhwa (2017) and Nkala (2016) argue that polycentered participation of stakeholders is a crucial component in achieving appropriate and definitive research outcomes for political and social decision-making in rural livelihoods. The findings may also be realistic. The functions of such stakeholders are assessed in the Jotsholo, Lupane district as a means to promote and increase successful participation, fostering sustainable rural livelihoods as people adapt to climate change. Climate change, including the global partnership for sustainable growth, as revealed by Scoones (2015), forms part of global Agenda 21. Ondieki (2018) also recognizes as critical players individual nations, foreign organizations, various organizations and the UN structure as well as NGOs, which Svodziwa (2019) also confirms.

In developing countries, strategies for adjusting to climate change also need to be explored as livelihoods remain focused primarily on rainfed agriculture (Svodziwa, 2015; Tibesigwa, 2015; Nyathi, 2013). Today more action and publication are required for farmers to take advantage of technological advances to adapt and mitigate climate disasters (Belle, 2016). Thus, adaptation and mitigation in general are of crucial importance for stakeholders. The most critically impacted areas are the marginal regions because climate change is undermining the livelihoods in these areas (Gukurume, 2013). This research is therefore focused on researching the involvement of stakeholders in sustainable rural adaptation strategies in Jotsholo, Lupane district.

Aims of the Study

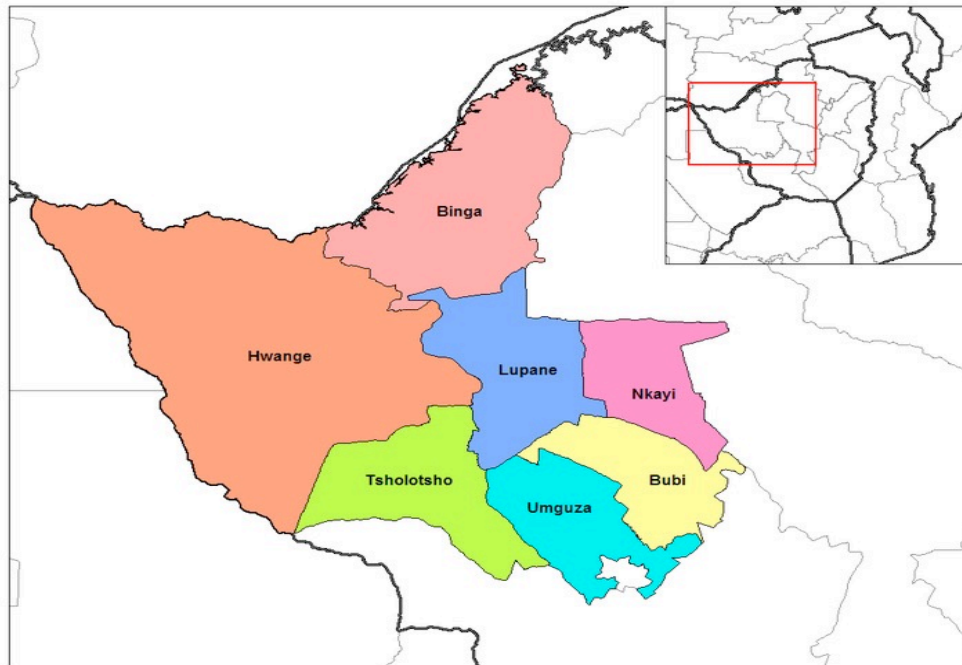
To examine the effectiveness of stakeholder participation in sustainable rural livelihoods strategies in Jotsholo, Lupane district.

Objectives of the Study

To identify the stakeholders participating in sustainable rural livelihoods strategies in Jotsholo, Lupane district

To examine the role of the stakeholders in sustainable rural livelihoods strategies in Jotsholo, Lupane district

The Study Area



The research was confined to Jotsholo in Zimbabwe's Lupane district. Jotsholo is made up of seven villages where data are stored. In Lupane (ZIMVAC, 2020) there are 26 wards with a population of 159 662. The number of people living in Lupane confirmed in 2012 was 160 000 (Zimbabwe Census, 2012). The most commonly spoken language here is Ndebele. In the research of ZIMVAC (2020) Jotsholo has a total of 1300 households, 987 of them rural households.

Conceptual Delimitations

The research was conducted in Lupane district a region with high temperatures varying from 22 to 30°C, 350 millimeters per year and low and irregular rainfall (Zimmerer, 2016). The soils are typically poor, infertile, sandy and high intake rates (Aguillar, 2019). The plants are composed of Mopane forests

and Acacia tree/shrub savanna (De Hereera, 2015). Zikhali (2015) states that drought occurs frequently and has adverse ramifications to the rural livelihoods.

RESEARCH METHODOLOGY

In order to collect key information on stakeholders' engagement in sustainable rural livelihoods strategies in Jotsholo, Lupane District, between January 2020 and August 2020, the researcher used questionnaires, interviews and focus group discussions (FGDs). Ward 11 has a total of 1,075 households, according to ZIMSTAT (2012). In data analysis the researcher employed probability sampling methods. In particular, it is possible that households will engage in the study with random samples. In order for respondents to be chosen (Rusinhmodzi, 2013) and random numbers generated using MS Excel 2010 the computer generated random numbers tables were used. The sample size machine was used for calculating the appropriate sample size (<https://www.surveymonkey.com/mp/sample-size-calculator/>). The estimates were based on the supposition that normal distribution of the population from which the sampled farmers were drawn. The sample was set to a confidence interval of 95%, and an error margin of 5%.

The sampled households were 92 based on this estimate. 93 domestic heads, who were randomly selected from four villages out of the seven villages of the Ward, were asked questions consisting of transparent, multiple answers and dichotomous questions. These questions addressed the identification of stakeholders in Jotsholo who are interested in sustainable rural livelihoods, the role of stakeholders in rural living strategies, and the challenges faced by the stakeholders in their search to create resilience in Jotsholo in Lupane district. In order to prevent misrepresentations, interviews with the main informants were performed in the local language (Ndebele). Three interviews were carried out with the Agricultural Extension Service Workers, the local village official, and the Non – Governmental Organisation delegate, who have been chosen on their behalf. A pilot study was conducted in order to delete and reframe unclear questions in order to inform the final questionnaire before the actual field survey was launched. All ethical procedures were conducted during the study.

RESULTS and ANALYSIS

The multi-stakeholder involvement of sustainable rural livelihoods as well as adaptation to climate disruption and change is demonstrated by Yeros (2002). In the area of study this is a central aspect of social capital in line with the Sustainable Livelihoods Approach which was used in this study. This research was designed to identify participants and their role in supporting sustainable adaptation to local climate fluctuations and adjustment to rural living conditions. A study of household views about the effectiveness and participation of stakeholders was therefore important to carry out.

Stakeholders Participating in Sustainable Rural Livelihood Strategies in Jotsholo, Lupane District

According to participants in the focus group discussions, government and its various organs like those in the Ministry of Environment, Water and Climate, Health and Child Welfare, educationists including academics, Agricultural Extension officers, officers from the Civil Protection Unit or Environmental Management Agency and the Zimbabwe Metrological Service Department, the Non - Governmental Organisations, local authorities such as the Kusile Rural District Council, the Chief, Ward counselor, kraal heads and the local community members have been identified as important stakeholders in climate variability and change matters in the Ward.

The views of Wu et al (2016); UN, (2018); Kalungu (2016), Makumbe (2016), Mazwi (2018), and Majali (2016) were also taken into account in this study. The roles of stakeholders vary from global to local. Roles are typically connected to access to resources and livelihoods. Therefore, an evaluation of stakeholder roles in Jotsholo District Lupane was considered to be useful for present research to provide a few insights into the matter in a marginal and local region.

To this end, the effectiveness of stakeholder roles was evaluated using a three-point likert scale, which was "less effective," "effective" and "not efficient." There is also discussion of Zimbabwe's new climate governance system. Zikhali (2010) considers among the stakeholders concerned with climate variability and change issues NGOs, scientists or researchers, such as climate scientists, media, technical citizens, general public (consumers and suppliers), farmers' advisers or extension educators. A party stakeholder is a group of people or a person with an interest in the achievement of the organization or society's purposes as described by Wright (2013). Stakeholders were often eligible for climate sensitive decisions as planners, administrators, supporters and policy makers (Twomlow, 2014). The stakeholder literature correlates with the fact that the person or organization is committed to achieving the objectives of the organisation.

Stakeholders' Participation in Sustainable Rural Livelihoods in Lupane district

The numerous Community-based Boards, made up of a variety of civil society organisations and local citizens, are at the bottom of the system. For the current research, this is the goal. As Madan (2017) referred to, local participation in climate change discussions provides useful data on the effects and potential responses to the problem of climate change. The notion of top-down approaches to climate change issues is thus questioned. Discussants proposed that the Ward should always be visited by experts and higher authorities to obtain the correct information on the entire problem of climate change and then work together for a solution which is sustainable.

Alternatively, they accepted that the NGOs were supportive and often visit the Ward, inform households on climate change and catastrophe issues and some provide assistance in different ways. For

example, World Vision conducted a four-day workshop with some households on Community-based Health and Disaster Management (CBHDM) in 2020. The focus of the workshop was Community-driven Early Warning Systems. In the session, the Lupane Early Warning Committee actively participated. This instills a sense of ownership among households as they actively engage in using their local capabilities to solve local issues.

From the above, it is possible to understand the advantages of 'self-mobilization' and 'interactive' aspects of stakeholder engagement in climate change issues as opposed to 'passive' ones (Svodziwa, 2020) However, though Scoones (2008) argues that the 'consultative' approach is not too inclusive, the requirements for financial and other infrastructural facilities still need help from the authorities or NGOs and cooperation to address the issues of climate variability and change for Jotsholo, who is not fully self-sustaining in terms of skilled person capacity. The tasks carried out by the Lupane Early Warning Systems Committee and other participants during the workshop served as direct proof of local human capacity building. In this strategy, with full collaboration, problems related to climate change are resolved more easily. Capacity building is therefore instrumental in forming the contours of adaptation to climate change and mitigation for the production of sustainable rural livelihoods.

Established in 2013, the Department of Climate Change has a mandate to spearhead the implementation of climate change policies and strategies in Zimbabwe. It has therefore established separate offices focusing on critical areas such as mitigation, adaptation, science, CDM, national communications, initiatives and publicity in climate change forums (Government of Zimbabwe, 2015). The department has a significant impact on all other forums in Zimbabwe's climate change governance system. Despite housing such offices, a lack of personnel, as revealed by one key informant, is hindering its coordination position. Therefore, as repeated by participants who rated the government roles and most of its organs as less successful, it becomes less powerful at local levels. The Climate Change Department has opened its doors to independent researchers who share an interest in the topic of climate change. The households at the local level, including the governance system, were not familiar with this agency.

This implies that engagement in climate change issues should include those at the grassroots level who usually bear the direct consequences of the phenomenon because their survival is entirely dependent on rain-fed agriculture, a situation Lamar (2016) and Kitschin (2016) have already emphasized that the Department of Zimbabwe Metrological Service plays a vital role in climate change as it tackles, among others, the empirical assessment, prediction and forecast of climate elements such as precipitation and temperature. The activities of the two elements (temperature and precipitation) in the Ward are a cause of concern, especially when in their extremes. According to the focus group discussants, due to the lack of a single weather station in the district, the position of the ZMSD is classified as not successful, their weather communication is only accessed by few households and the officers rarely visit the Ward.

As discussed by Gukurume (2016) and IPCC (2007), households rely on their IKS in this case. For example, during the focus group discussion, it emerged that households predict flooding in Jotsholo, which usually occurs during or after heavy down pours as back flow by the presents of hippopotamus in their zone. In the flood plains, the volume of water often alerts households to imminent flooding. While households with radios and television sets receive contact and prediction on weather forecasts, due to low signal in the valley and lack of power for the equipment, these media are not accurate.

Table 1. Summary on Stakeholder Roles in Promoting Sustainable Rural Livelihoods Adaptation to Climate Change in Lupane District

Stakeholder	Role(s) in promoting sustainable rural livelihood adaptation to climate change	Effectiveness
District Development Coordinator	Provision of inputs (though not timeously), provision of clinic services (like provision of nursing staff), education services (like deployment of qualified teaching staff) and disaster relief though not enough.	Less effective
NGOs (UNICEF, IMO, Help from Germany, World Vision, Zimbabwe Red Cross Society)	Help from Germany - provision of farm inputs. World Vision - provision of sanitation and water (boreholes). UNICEF - provision of education material. RED CROSS - provision of education, water and sanitation IMO - once built houses for flood victims.	Effective
Chief	Lobby for development of the area, takes Ward issues and challenges to the government.	Effective
Kraal head	Enforces laws/ regulations, pass resolutions to minor altercations in the village, report to the councilor on issues arising in the village and participates in the distribution of the land.	Less Effective
ZMSD	Provide weather reports/ forecasts through the radio otherwise they are not physically seen in the area as there is no meteorological sub-stations.	Less effective
Agritex Department	Encourage good farming practices like conservation farming and the production of drought tolerant commodities.	Less effective
Ward Councilor(s)	Foresees ward governance and law maintenance in the Ward, oversees the distribution of relief goods in the ward, attend meetings/ workshops/ conferences with NGOs to do with communities.	Less effective
Local households	Implement the rural livelihoods adaptation strategies to climate variability and change.	Effective

As already verified by one participant, facilities such as roads and bridges connecting Jotsholo Ward with other places such as Kusile Growth Point are in a dilapidated condition. The ward is unavailable during the rainy season, worsening the situation. No monetary resources are allocated for the development of the region, particularly in the current economic circumstances in which the government is struggling to pay its civil servants. The CPU also provides education and knowledge of disaster problems, but it has rarely been found in the region. These typically combine their visit with the NGOs that frequent the area when households come to monitor projects being carried out in the Ward. The Chief , the Ward counselor and the heads of the kraal are the households' channels of contact and

link them with the government, which is the key decision-making board. The participants unanimously assessed the role played as successful by the NGOs.

The role played by the Chief was commended by the participants and rated successful. The chief gave input to households from the conference. They noted, however, that, as stated by the IPCC (2007), the government delayed addressing problems faced in the Ward due to resource constraints rather than political will. On the other hand, the heads of the Kraal and the Council who implement and anticipate compliance with environmental laws or regulations, including best practices in the execution of livelihoods, were considered less successful because they are often found to breach the laws by cultivating stream banks leading to river siltation.

As they pointed out that they were compliant and enforced whatever was necessary within their capabilities, the local households rated themselves successful. They indicated, for example, that they provided labor in the execution of certain adaptation methods that were not capital intensive. Whenever they arrived with initiatives for the Lupane district, they collaborated with NGOs and even government organs. The local community also suggests areas where they needed assistance inside their Ward including rebuilding of schools and bridges destroyed by floods and the building of foot bridges. Because of the lack of capital, some of these problems are still pending. Another example given during the survey was that during the repairs of classroom blocks destroyed by flooding, some community members moulded bricks and fetched pit sand and river sand. Given these and more experiences, they classified their involvement as good. The local citizens of Lupane are at the receiving end and strategic recipients are recommended.

Level of Participation in Policy Formulation in Lupane District

The respondents' level of participation in policy formulation process regarding sustainable rural livelihood adaptation to climate variability and change in Lupane district was probed.

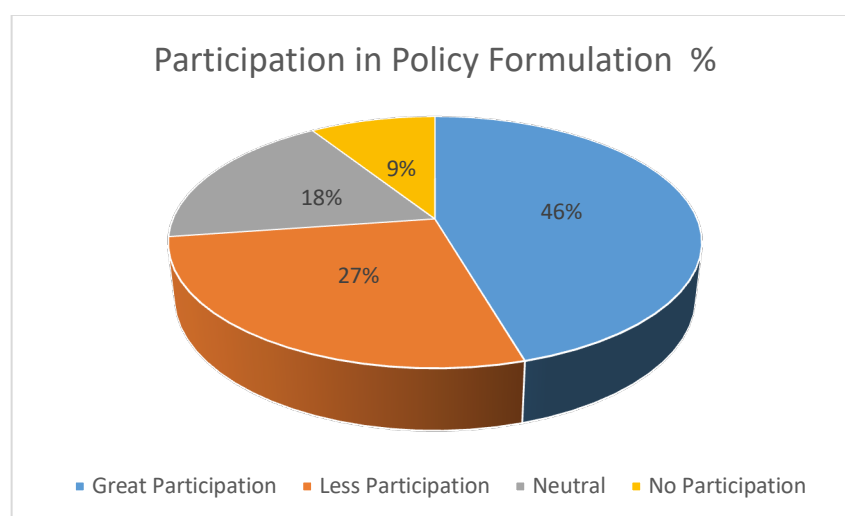


Figure 1. Level of Participation in Policy Formulation in Lupane District

The primary informants and those individual households who are followers of current events in the Ward may have been included in the households that confirmed great involvement in policy formulation of the process (46 percent). This was accompanied by 27%, which meant that there was less involvement. Eighteen percent of respondents were neutral and nine percent noted that the stakeholders did not engage significantly in rural livelihoods adjusting to climate change in the district of Lupane.

Despite Goverich (2017) and Makumbe (2016) assertion that the country does not yet have its own climate change policy or legislation, there have been reviews of existing sectoral acts, such as environmental law, which support pollution mitigation and environmental degradation. For instance, the EMA in Zimbabwe is in charge of ensuring that the people comply. Svodziwa (2020) and Mazwi (2018) reported success stories on the Environmental Management Authority, but the emphasis was on Zimbabwe's southern lowland, where Chiredzi, Chivi, Bikita and Masvingo are located leaving a little coverage of the South-West part of Zimbabwe that is the district of Lupane, Jotsholo.

Level of Involvement in the Implementation of Policy or Regulation Systems on Rural Livelihoods Adaptation

Based on these findings, the use of automated weather stations will increase Indigenous Information Systems and enable the population to mitigate climate change negative impacts. When households are completely acquainted with the phenomena of climate change and each stakeholder has its positions faithfully and efficiently, resilience can be improved and vulnerability of the population to climate instability and change can be reduced that will encourage sustainability of the adaptation efforts.

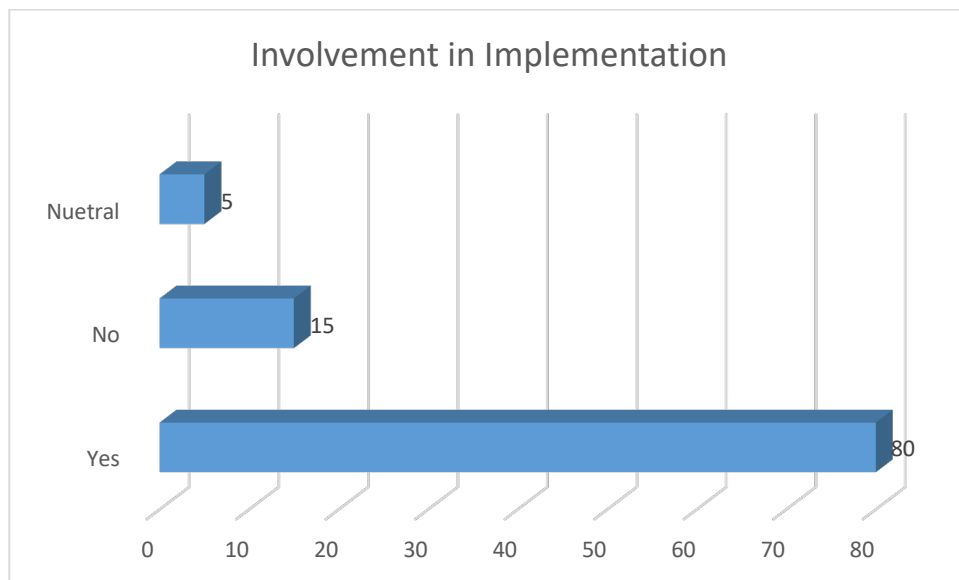


Figure 2. Involvement in Implementation

Figure 3.2 reflects the involvement of stakeholders in the implementation of policy or regulations on livelihoods adaptation in Lupane district. It should be noted that 80% of rural household participants participate in the policy implementation. This is because they pursue livelihoods and have to reach their

ends. This entails collaboration with a variety of civil society organisations, NGOs and government sectors, in particular in Jotsholo Ward.

Training to Enhance Livelihood or Adaptation Strategies to Climate Change

Table 2. Training to Enhance Livelihood or Adaptation Strategies to Climate Change

Training	Percentage Response %
Community Disaster Survival Education	30
Sustainable Natural Resource Use and Management	60
No training	10

n- 92

Table 3.2 reflects training that are needed to enhance livelihood or adaptation strategies to climate change in Lupane district. Areas on training that were conducted in the ward are sustainable natural resource use and management (60%), community disaster survival education (30%), and those who did not have any training (10%). Local leadership reports on the effects of discussions at the city, regional and national level from forums, seminars and conferences for households. The proportion of households who did not recognize any trainers exceeded those who had been trained in all three sets of trainers. The present component of aid to disadvantaged populations is the capacity-building (training of life skills) to be autonomous and in the absence of NGOs continuity. Mechanisms must be introduced to ensure that all households engage in such preparation.

Svodziwa (2015) addressed the institutional functions of the university in order to get the message of climate variance and change reaching populations. Kalungu (2016) has explicitly indicated (2012) to universities that they are important for populations they represent by integrating or infusing into their curricula problem physical and social problems such as climate variability. Science and IKS exchanges are facilitated in order to promote sound adaptation strategies. To that end, through a Memorandum of Understanding with Zimbabwe Metrological Service Department, the Lupane State University at which Jotsholo Ward is located in Lupane District built a meteorological station equipped with recording instruments for weather and carry out programs on Climate Change. The climate data for use in climatological studies have been produced since 2013. In addition, programs that take climate change issues into account are running and improving. Candidates who will distribute knowledge and adaptation options on climate change later are also qualified and prepared.

CONCLUSIONS and RECOMMENDATIONS

Finally, the stakeholder positions on climate change are complex and not underestimated. In conclusion, it was explained. In the case of Jotsholo, the functions are usually limited in effect because there is no time period and resources are restricted. Other players typically pay fewer visits to the Ward. NGOs were nevertheless thanked for their strong support in this ward, which includes training and other material donations. Human empowerment promotes donor syndrome elimination and stimulates

innovation. In order to ensure sustainable adaptation of climate fluctuations and transition, enhancing cooperation and collaborations between governments and NGOs, the private sector and local communities should be strengthened.

Given that climate change issues have become a central issue around the world, the involvement of all in reducing or eliminating adverse effects in this crisis is seen as positive. In Jotsholo, the government has therefore been recognized as a key player in any issues related to the Ward, including climatic variability and change, through its different institutions, the NGO's, local authorities such as the Chief, Ward Counselor, Kraal Heads and the local community members. The government through its organs is yet to come up with climate variability and change policy. This has been long overdue and the present research recommends prompt action to be taken. Capability development to facilitate this process of policy development could be encouraged to keep up with local and international events.

The general household rated ineffectiveness of government participation stemmed from its prolonged and delayed implementation of expected services by the local community. This is illustrated by the unrepaired infrastructure of Cyclone Elena in 2000, e.g. bridges and roads. The current research therefore recommends that the government preserve its reputation by taking the welfare of vulnerable communities such as that around Jotsholo seriously and promptly into account.

The most disadvantaged people socially and economically disabled by climate events should also be given priority. The government could also lead community empowerment by building local people's capacity in self-help projects. This will reduce their over-reliance on donations and promote innovation and creativity. In trying to increase adjustment efforts among local communities, the government can continue to lobby for the relief of global climate change funding conditions to qualify as a country of access and to benefit from the creation and implementation of adjustment strategies such as other developing countries in a meaningful way. The government must ensure that, once funding is made available, this money is earmarking for projects that support the communities affected.

This research advises the generation of up-to-date data on climate change issues on behalf of educationists and academics to facilitate constructive dialogue in international forums. Researchers complain about the inadequate support in marginalised communities for studies related to climate fluctuations and change (Donner et al., 2016; Shisanya and Mafongoya, 2016). Thus, the current research highlights that the government, including the private sector and NGOs, should develop frameworks for financing research in order to build better data sets on climate change. Strengthening government, NGOs, the private, local and academic partnerships may enhance sustainable climate change adaptation in this region. Therefore, Zimbabwe climate change governance should take all stakeholders from the grassroots point of view in a meaningful and similar way.

REFERENCES

- Adekalu, K.O. (2017). *Crop rotations and residue management in conservation*. Available at: <https://www.springer.com/gp/book/9783319116198> (Accessed on 10 September 2019).
- Aguilar, E. (2019). Changes in Temperature and Precipitation Extremes in Western Central Africa. *Journal of Geophysical Research: Atmospheres*.
- Ayele, T J. (2018). *Livelihood Adaptation, Risk and Vulnerability in Rural Wolaita, Ethiopia*. An Unpublished Thesis.
- Belle, J., Moyo, S., & Ogundeji, A. (2016). Assessing communal farmer's preparedness to drought in Lupane District, Zimbabwe. *International Journal of disaster risk reduction*.
- Chazovachii, B., Mutumi, C., & Bowora, J. (2013). Community Gardens and Food Security in Rural Livelihoods Development: The Case of Entrepreneurial and Market Gardens in Mberengwa Zimbabwe. *Russian Journal of Agricultural and Socio- Economic Sciences*, 1 (13), 1-10
- Chimhowu, A. O. (2012). Extending the grain basket to the margins: Spontaneous land resettlement and changing livelihoods in the Hurungwe District, Zimbabwe. *Journal of Southern African Studies*, 28(3), 551-573
- Davies, R. (2015). *The most significant change technique*. Available at: <https://www.europa.eu> (Accessed on 6 June 2020)
- De Hereera, D., & Sain, S. (2015). *Soil distribution and classification*. London: Oxford University Press
- Elia, E. F., Mutula, S., & Stilwell, C. (2014). Indigenous knowledge use in seasonal weather forecasting in Tanzania: the case of semi-arid central Tanzania. *South African Journal of Library and Information Science*, 80(1), 18-27.
- FAO (2017). *Moving Europe towards full precision agriculture*. Available at: <http://www.fao.org/eagriculture/news/moving-europe-towards-full-precision-agriculture> (Accessed on 10 July 2020)
- Govereh, J. (2017). *Impact of Tsetse Control on Immigration and Household Accumulation of Capital in Zambezi Valley, Zimbabwe*. Unpublished PhD Thesis, Michigan State University
- Government of Zimbabwe. (2015). *Zimbabwe's National Climate Change Response Strategy*. Government of Zimbabwe. Ministry of Environment, Water and Climate.
- Gukurume, S. (2016). Climate change, Variability and sustainable agriculture in Zimbabwe rural communities. *Russian journal of agricultural and economic sciences* 2(14), Available at: <https://cyberleninka.ru/article/n/climate-change-variability-and-sustainable-agriculture-inzimbabwe-s-rural-communities> (Accessed on 1 November 2020)
- IPCC, (2007). Determinants of Risk: Exposure and Vulnerability, *International Panel on Climate Change*.
- Kalungu, J. W. (2016). An Assessment of the Impacts of Climate Change on Smallholder Householding Practices and the Role of Gender on Adaptation Strategies In Semi-Arid and Semi-Humid Regions of Kenya.
- Kitchin, F and Tate, B. (2016). Why Are Rural Rural Households Vulnerable to famine? *IDS Bulletin* 20(2): 8-15

- Lamar, B. (2016). *Precision agriculture and the future of farming in Europe*. European parliamentary research service.
- Madan, C.R., & Kensinger, E.A. (2017). *T retest reliability of brain morphology estimates*. Available at: <https://www.researchgate.net/publication/312080195>(Accessed on 6 December 2019)
- Majali, E. (2016). Organizational culture and its relationship with the organizational climate in the youth higher council from the perspective of council staff. *Journal of Education and Practice* 7(8).
- Makumbe, J. (2016). *Democracy and Development in Zimbabwe: Constraints of Democratisation*. Harare: SAPES Books
- Mazwi, F., Chambati, W., & Mutodi, K. (2018). Contract farming arrangement and poor resourced farmers in Zimbabwe.
- Nkala, P. (2016). Assessing the impacts of conservation agriculture on farmer livelihoods in three selected communities in central Mozambique.
- Nyathi, S. (2013). Adoption of Adaptation mechanisms in Matobo district: Challenges and opportunities for enhancing food security in ward 11.
- Ondieki, G.K. (2018). Climate Change Adaptation and Disaster Risk Reduction Regimes: International Legal Frameworks and Institutional Linkage.
- Panhwa, A.H., & Shar, A.S. (2017). Post positivism: An effective paradigm of social and educational research. *International Research Journal For Arts and Humanities*.
- Rahman, M. (2017). Weed management in conservation agriculture in Bangladesh Asian pacific weed science society.
- Rusinamhodzi, L. (2013). Integration of conservation agriculture in smallholder farming systems of Southern Africa: Identification of key entry points. Conservation agriculture systems research in Southern Africa
- Scoones, I. (1998). *Sustainable Rural Livelihoods: A Framework of Analysis*. New York, Weaver Press
- Scoones, I. (2015). *Sustainable rural communities and rural development*. *Journal of Political ecology*. UK: Practical Action Publishing and Winnipeg, CA: Fernwood Publishing
- Svodziwa, M. (2015). The feasibility of small grains as an adoptive strategy to climate change. *RJOAS*, 5 (41).
- Svodziwa, M. (2019). Dynamics of Women's Land Rights, Agrarian Change and Gender Transformation in Zimbabwe's Fast Track Land Reform Programme. <http://dx.doi.org/10.2139/ssrn.3340839>
- Svodziwa, M. (2020). Contribution of Sorghum Production towards Household Food Security in Jambezi, Zimbabwe. <http://dx.doi.org/10.2139/ssrn.3627196>
- Tibesigwa, B., Visser, M., Collinson, M., & Twine, W. (2015). Gender differences in climate change risk, food security, and adaptation: A study of rural household's reliance on agriculture and natural resources to sustain livelihoods, Environment for development discussion paper series EfD DP 15–20. Cape Town: Economics Policy Research Unit.
- Twomlow, S. (2014). Effect of conservation agriculture on maize yield in the semi-arid areas of Zimbabwe.
- UN. (2018). Sustainable development goals. Available at: <https://sustainabledevelopment.un.org> (Accessed on 1 June 2019)

- Van Aelst, K., & Holvoet, N. (2016) Intersections of gender and marital status in accessing climate change adaptation: Evidence from rural Tanzania. *World Development*, 79: 40-50.
- Wright, G., Noble, M., Ntshongwana, P., Barnes, H., & Neves, D. (2013). Lone mothers in South Africa: The role of social security in respecting and protecting dignity. Technical Report. Cape Town.
- Wu, X., Lub, Y., Zhou S., Chen, L., & Xu, B. (2016) Impact of climate change on human infectious diseases: Empirical evidence and human adaptation. *Environment International* 86: 14-23.
- Yeros, P. (2002). *The Political Economy of Civilization: Peasant Workers in Zimbabwe and Neo-Colonial World*. Unpublished PhD thesis, University of London.
- Zikhali, P. (2010). *Fast Track Land Reform Programme, Tenure Security and Agricultural Productivity in Zimbabwe. Livelihoods After Land Reform in Zimbabwe*. Working Paper 7. Livelihoods after Land Reform Project, South Africa: PLAAS.
- Zikhali, P. (2015). *Livelihoods after land reform in Zimbabwe. Fast track land reform programme, tenure security and agricultural productivity in Zimbabwe*. Centre for World food studies.
- Zimmerer K.S., & Vanek S.J. (2016) Toward the integrated framework analysis of linkages among agro biodiversity, livelihood diversification, ecological systems, and sustainability amid global change. *Land* 5(10): 1-28.
- ZimVac (2020) *Zimbabwe Livelihood Zone Profiles*. Harare, Zimbabwe.