

Influence of Governance and Institutional Structures on Flood Management and Control in Kilosa District, Tanzania

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Abstract- Many people lose their lives each year due to disasters in Tanzania, with a vast property damage. When compared to others, floods are the number one damaging economics and causing loss of lives. The Mkondoa River is one of the biggest rivers which causes floods in Kilosa District. This article, has explored the influence of governance and/or institutional structures on the management and control of floods, in the four villages adjacent to Mkondoa River in Kilosa District. The fundamental argument of the article is that, the existing governance and institutional structures are insufficient in terms of providing structural and non-structural measures before, during and after floods. This is mainly because of the top-down decision making set up, inadequate funding, lack of disaster experts, and the delay of reliefs to flood victims. The article also identifies that, these problems were in place due to economic, political, environmental, and social settings. It is concluded that, efforts are needed to strengthen the performance of governance and/or institutional structures particularly in creating a network of flood management actors, which the responsible institutions should involve the community accordingly, in the processes of managing and controlling floods.

Index Terms- Flood, Governance, Institution, Kilosa.

I. INTRODUCTION

A wide body of scientific literature in the world (Loster, 1998 and Mioc *et al.*, 2008), has consistently acknowledged that, floods are among of the natural disasters which occurs in many parts of the world, causing deaths and injuries of people and destruction of properties.

International Strategy for Disaster Risk Reduction (ISDR), (2017) also acknowledged that, floods accounts for 6.8 million deaths in the current two decades of the 21st Century and have affected more than 2.8 billion others worldwide. ISDR, (2017) further posited that, deaths due to disasters from weather-and climate-related events (floods in particular), accounted for the many deaths in most years and there has been a sustained rise, more than doubling, over the past forty years.

Records further hold that, Asia is the most flood affected region, accounted for nearly 50% of the flood related fatalities in the last quarter of 20th Century (Doocy, 2013), whereby China,

India, Nepal, and Bangladesh attracted great attention throughout the world (Loster *et al.*, 1998).

Regarding to that, floods exacerbate negative impacts around the world, governance and institutional structures have been in place to ensure that, the vulnerability and effects are minimized. The core role of these governance and/or institutional structures, include among others, to predict climate change and produce assessment reports which raise awareness on floods and suggest actions needed to minimize the effects (World Meteorological Organization, 2011).

Africa like other continents similarly, has not been spared by the incidences of floods. UNEP & UNESCO, (2011) reported that, many people in Africa (about one billion) were vulnerable to floods. Floods in the continent have been driven out by different factors such as having unplanned human settlements in flood prone areas, which appear to play a major role in increasing flood risk (Di Baldassarre, *et al.*, 2010). Poverty, has also cited as an underlying factor which influenced people to live in areas which are prone to floods in Africa (Douglas *et al.*, 2008).

Furthermore, most African countries have been combating floods by establishing institutional and governance structures. These governance and institutions structures, have been dealing with various activities including weather forecasting, although they have been using low technologies (Leijnse, *et al.*, 2007). Other activities encompasses raising of people awareness on preparedness, urban planning, and discouragement of human settlements in flood prone areas (Di Baldassarre, 2010).

As for Tanzania, throughout much of Africa, many rural and urban communities have been also experiencing at varying degrees flood risks, which have been resulting to severe effects at both household and national level. Regions which have been often susceptible to floods in the country include Dar es Salaam and Morogoro (Senga, 2007), just to mention a few.

In terms of Morogoro Region, Kilosa District in particular, records indicated that, there have been frequent floods in the District since 1930's, principally due to the overflow of the rivers, including Mkondoa river (UNICEF, 2013). Due to that, the colonial government had built water reservoirs and levees along the river to prevent floods. Nevertheless, because of the lack of regular maintenance, the levees and check-dams for reserving water broke out (Maringos, 2014). This has caused Kilosa District to be the worst flooding area in the country (URT, 2005).

Reports from the Prime Ministry Office, (2010) and UNICEF (2013), have disclosed that, the main factors which caused floods in Kilosa were the heavy rains, environmental degradation, river siltation, and destruction of dams, lack of enough water reservoirs/check dams, and destruction of levees of the Mkondoa River (URT, 2005).

In addition to that, Maringo (2014) had revealed that, projects conducted in Kilosa District had succeeded to some extent especially, in creating public awareness and preparedness for floods. On the other hand, some initiatives had not been succeeded, particularly prevention and mitigation as many projects have been wended up unfinished (European Commission, 2011) and others, have not even started after being proposed (PMO, 2010) while floods are still occurring. Lack of funding is one of the major bottleneck which limited the implementation of these initiatives (Brouwer *et al.*, 2008).

To address the problem, the governance and/or institutional structures, have put in place to oversee the management and control of floods through different practices, including putting restrictions on the harmful practices in the river systems, both in the upland and lowland areas (PMO, 2010; UNICEF, 2013) and afforestation programs (Nduwamungu, *et al.*, 2004).

While the presence of governance and/or institutions structures in overcoming floods are widely acknowledged (Navrud *et al.*, 2012), the extent that are instrumental in halting floods in Kilosa District is inadequately understood. Therefore, this article is an attempt to that end.

II. MATERIALS AND METHODS

2.1 The study area

The study area has been selected based on riverine flood prone area, flood data availability, diverse socio-economic characteristics, and accessibility. Four villages (Kiyangayanga, Mbwamaji, Mbumi A and Mbumi B) of Kilosa District in Morogoro region (Tanzania) were involved in this study. The District lies between 6°S and 8°S, and 36°30'E and 38°E as well has a flat lowland which has covered the whole of the eastern part.

Kilosa District has a semi-humid climate, receiving an average rainfall of 800 mm annually. The temperature ranges from 25°C and 28°C and is divided into three zones which are; flood plain zones with an altitude of about 550m made up of poorly drained, black cracking clays in the central parts subjecting to seasonal flooding. Plateau zones with an altitude of around 1,100m made up of moderately fertile, well drained sandy soils which are highly erodible (Burgess *et al.*, 2007). A highland zone with an altitude up to 2,200m which is made up of highlands (Kilosa District Council, 2010).

The human population of Kilosa District was 438,175 people (URT, 2012). Regarding to the major livelihood groups in the District, more than 80% of the people depended on agriculture and forest based resources for their livelihoods (Kilosa District Council, 2010). Pastoralism also is another economic activity in the District.

2.2 Data collection

2.2.1 Household surveys

The researcher and field assistants administered questionnaires to 100 respondents by face to face to achieve both qualitative and quantitative data. Questionnaires were pre-tested to check wording, clarity, layout, and recruited four local field assistants and they had different issues including respondents' socio-economic background, available governance and/or institutions structures, for managing and controlling floods and their activities, as well the effectiveness of those governance and institutions structures in curbing floods.

2.2.2 Focus group discussions

Formal discussions were held by involving local leaders, males, females, and pupils. Each group had three participants. Members in each group, concentrated on a number of issues dealing with the governance and/or institutions structures arrangements in flood management and control, as well the level of coordination and participation between the local people, governance, and institutions.

2.2.3 Key informant Interviews

The researcher, also held formal interviews with persons whom played a spontaneous role in acquiring knowledge on different aspects of life, both within the community and from outside, and also got opportunities in their daily engagement to share and disseminate information. They include local leaders, professionals, and residents whom have firsthand knowledge about the community and experience of floods in the area. Interviews were intended to reveal understandings, expectations, and perspectives relating to the influence of governance and institutional structures arrangements, in flood management and control. They also included views, ideas, and suggestions, on how the governance and institutional structures could facilitate the sustainable management and control of floods.

2.2.4 Field site visits

All study villages were visited by the researcher and field assistants so as to get full image of the measures taken by the governance and/or institutional structures in managing and controlling floods. Issues which were observed included the visible floods management and control practices, economic activities, and resources available. The information from the visits were used to compare those obtained from other methods of data collection so as to minimize distortions provided by the respondents, conceptualizing the intervention beyond the interviews, and observing issues which respondents would be unable or unwillingly to insensitive ones.

2.2.5 Documentary review

Secondary data were accessed through books, journals, and official reports. Documentary review was used to identify the link between governance and/or institutional structures and flood management and control practices. The review was also used to get an understanding of the issues related to the thematic research area. For example, such information as flood management practices and institutional coordination, perceptions on flood management and control practices and tools/approaches of flood management and control.

2.3 Data analysis

Collected data were cleaned, coded and for the quantitative data they were analyzed through the usage of the Statistical Package for Social Sciences (SPSS) 16.0 computer programs, for windows. Qualitative data were analyzed by using the content analysis technique, which mainly involved the transcription of the recorded note books and then clustering information into sub-themes.

III. RESULTS AND DISCUSSIONS

3.1 Socio-economic background of the respondents

Respondents' age, sex, education, and occupations were assessed. The study had a total of 100 respondents of whom 72.41% were males and 27.58% females. Reasons for males to participate more in this study could not be established. However, this could have happened by a chance. As for the ages, 66.33% of the respondents were aged between 41 and 80 years and

31.83% between 21 and 40. This implied that, many of the people were economically active.

In terms of education, results showed that, 64.33% of them had attained a primary school education and 15.25% secondary education. This implied that, many of the villagers had a little level of education which might have the implication in flood management and control. Regarding the occupation of the respondents, results have disclosed that 63.75% had farming and livestock keeping as their primary occupations. Others were engaged in businesses like shop keeping, motorcycle business locally known as *bodaboda*, welding, carpentry, catering locally known as *baba* and *mama lishe*, and tailors (Table 1).

Moreover, 67.58% of them were married. By considering households' income status, almost 65.48% of them had an average monthly income below 50,000 Tsh. (\$ 22.34) per month. This portrays the actual situation of the rural poor whom depends on subsistence farming as a principle source of income.

Table 1: Socio-economic background of the respondents

Socio-economic background of the respondents							
Responses (%)							
Socio-economic background	Kiyangayanga (n=25)	Mbumi (n=25)	A Mbumi (n=20)	B Mbwamaji (n=30)	Total (%)	Average (%)	
Age							
15-20	0.00	4.00	0.00	0.00	4.00	1	
21-40	24.00	40.00	30.00	33.33	127.33	31.83	
41-60	40.00	28.00	35.00	30.00	133.00	33.25	
61-80	36.00	28.00	35.00	33.33	132.33	33.08	
above 80	0.00	0.00	0.00	3.33	3.33	0.83	
Sex							
Male	80.00	68.00	75.00	66.66	289.66	72.41	
Female	20.00	32.00	25.00	33.33	110.33	27.58	
Marital statuses							
Single	16.00	20.00	20.00	20.00	76.00	19.00	
Married	76.00	56.00	65.00	73.33	270.33	67.58	
Widowed	8.00	24.00	15.00	6.66	53.66	13.41	
Divorced	0.00	0.00	0.00	0.00	0.00	0.00	
Education							
Informal education	8.00	32.00	15.00	26.66	81.66	20.41	
Primary education	64.00	60.00	80.00	53.33	257.33	64.33	
Secondary education	28.00	8.00	5.00	20.00	61.00	15.25	
College/University	0.00	0.00	0.00	0.00	0.00	0.00	
Occupation							
Farming/livestock	56.00	48.00	65.00	86.66	255.00	63.75	
Business	32.00	44.00	25.00	0.00	101.00	25.25	
Civil Employee	12.00	8.00	10.00	13.33	43.33	10.83	
Income (Tsh.)							
≤ 50,000	52.52	64.64	70.70	74.06	261.92	65.48	
50,000-100,000	28.28	20.20	25.25	16.83	90.56	22.64	
100,000-500,000	12.12	8.08	0.00	6.73	26.93	6.73	
500,000-1,000,000	4.04	8.00	5.05	3.36	20.45	5.11	
Above 1,000,000	4.04	0.00	0.00	0.00	4.04	1.01	

N=sample size, (%) = percentage. Source: Field survey data, 2017.

3.2 Governance and institutional structures for managing and controlling floods.

Governance and/or institutions structures dealt with flood management and control, were assessed at both national and local level. At the national level, floods as other disasters, are under the mandates of the central government (Prime Minister's Office Department of Disasters) and the local government (District/Town Councils as well as Ward and Village Councils).

According to the National Disaster Management Act (URT, 2015), the central government is responsible to formulate a disaster policy and regulatory frameworks, promote and facilitate coordination of various stakeholders, whom are engaged in disaster management at all levels. Regarding the local government authorities, they have to implement the disaster Act and policy in their areas of jurisdiction. Furthermore, the

government recognizes and acknowledge the role performed by private sector and NGO's in disaster management.

As for the study area, results have revealed that, 70.83% of the respondents disclosed the presence of governance and institutional structures, which were involved in one way or another in flood management and control (Table 2). They included Ward and Village government offices and Disaster Management Committees at the Ward, Village and Sub-village levels.

The possible reasons for the majority of the respondents to be able to identify these governance and/or institutional structures, could plausibly be the good awareness among the local people concerning the structures and their several participation in electing leaders.

Regarding to the leadership of these institutions, the Wards are under the Ward Executive Officers (WEO's), the Villages are under the Village Chairpersons and Village Executive Officers (VEO's), and Streets are under the Streets Chairpersons. As for the disaster management committees, they are under the Chairpersons and Secretaries whom are obtained through village and streets voting, by appointed, as well by government recruitments.

Notwithstanding, most of the identified governance and/or institutional structures, were not functioning well to manage and control floods as was observed by 65.75% of the respondents, due to lack of local people participation in decision making, illiterate of leaders, funding, disaster experts, and the lack of disaster management guidelines at the local level.

Table 2: Flood governance at local level

Village	Government Institutions/ Structures (%)		Type of institutions/ structures	Functional (%)		Reasons for mal-function
	Yes	No		Yes	No	
Kiyangayanga	52	48	Ward and Village government offices, Disaster committees	40	60	Limited local people participation in decision making, lack of disaster experts in the committees
Mbumi A	80	20	Ward and Village government offices, Disaster committees	34	66	Lack of involvement of local people in decisions, lack of disaster experts in the committees, illiterate of the local leaders.
Mbumi B	80	20	Ward and Village government offices, Disaster committees	43	57	Lack of funding allocated for disaster management, lack of disaster experts, lack of local people participation in decision making
Mbwamaji	71.33	28.67	Ward and Village government offices, Disaster committees	20	80	Illiterate of the leaders, lack of funding for disasters, lack of detailed disasters reports in the meetings, lack of disaster experts, lack of disaster committees guidelines
Total	283.33	116.67		137	263	
Average	70.83	29.16		34.25	65.75	

What can be deduced from this scenario is that, top-down approach has been used in decision making. Therefore, local structures and institutions remained as recipients of orders and decisions from higher levels. The situation however, could be worse as the local level institutions were similarly lacked disaster experts and they were also poorly funded. Discussions, with Ward and Village leaders have revealed that, they had no mandate to mobilize funds for flood management and control, without a permit from higher levels. For this, they have to wait until floods engulf their areas, then it is where they can raise their voice for asking help from the District and Regional Offices.

3.3 Activities attempted by governance and institutional structures

Study results have indicated 64.17% of the respondents posited that, there were activities performed by the local governance and institutions to manage and control floods (Figure 2). They encompassed the construction of river embankments, rehabilitation of the damaged roads, assessment/evaluation of the damages, planting of trees alongside Mkondoa River, and the distribution of reliefs. The District Coordinator of Climate Change and Statistics also added that, the governance and/or institutions were also providing District climate change predictions, education, and prohibiting anthropogenic activities, such as charcoal making and farming close to Mkondoa River and other water sources.

Other functions include keeping office records, protecting office properties, searching and inter into agreement, with

stakeholders whom involved in flood management and control practices.

However, it was claimed by respondents that, activities were not carried equally. Claims were raised mainly by people from Magomeni Ward (Kiyangayanga and Mbwamaji Villages). They posed that, they were been ignored in terms of assistance whenever floods occur. They further aired out that, assistances were pushed to the other side (Mbumi Ward).

This study has disclosed that, this situation was in place in view of the fact that, most of the local administrative offices, were in Mbumi Ward like a primary court, schools and other local government offices. Therefore, the closeness of these local institutions in Mbumi Ward, could influence an easy accessibility of the aids and information when compared to people from Magomeni Ward whom were far.

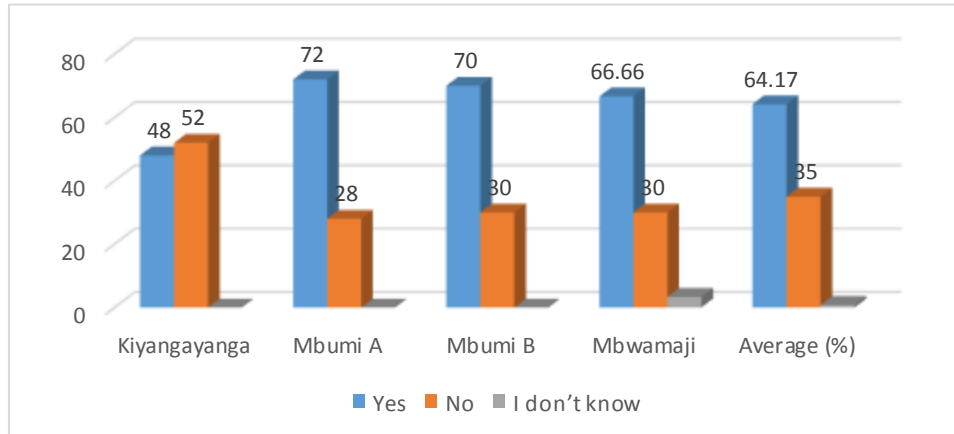


Figure 2: Views on activities conducted by governance and institutional structures to manage and control floods.

During field site visits, many of the activities which respondents and key informants stated were that, the governance and institutional structures which attempted to manage and control floods were observed. Some of them include planting of

reeds at the banks of Mkondoa river and placing of posters, which restricted to conduct anthropogenic activities within 100 meter from the Mkondoa river (Figure 3 and 4 below), just to mention few.



Figure 3: Flood control reeds ('Matete') alongside River Mkondoa banks.



Figure 4: Poster warning to do activities within 100m from River Mkondoa and 30m from the railway reserve.

Apart from that, the level at which the governance and institutional structures had achieved to manage and control floods in the study area, was also explored so as to understand whether they had succeeded or not. To get answers for it, respondents were asked to what extent they ranked the achievements made, based on the following response categories: very low, low and moderate. Results have indicated that, majority of them had views that, achievements were less (Figure

5), because the impacts were escalating whenever floods occurred.

Various factors were raised for such failure, including biasness in the distribution of relief/aids and poor rehabilitations of the damaged infrastructures over a long period of time for example the embankment ('uta') in Mbumi Village.

Residents whom were in flood prone areas also were promised for a long time that, they would be relocated to safer places without implementation. However, the government

institutions in place relied much on private institutions to provide aids to victims. Other reason furthermore, was the weak economy at household level, as many of the surveyed

respondents (65.48%) stated that, their monthly income was ≤ Tsh. 50,000 (Table 1).

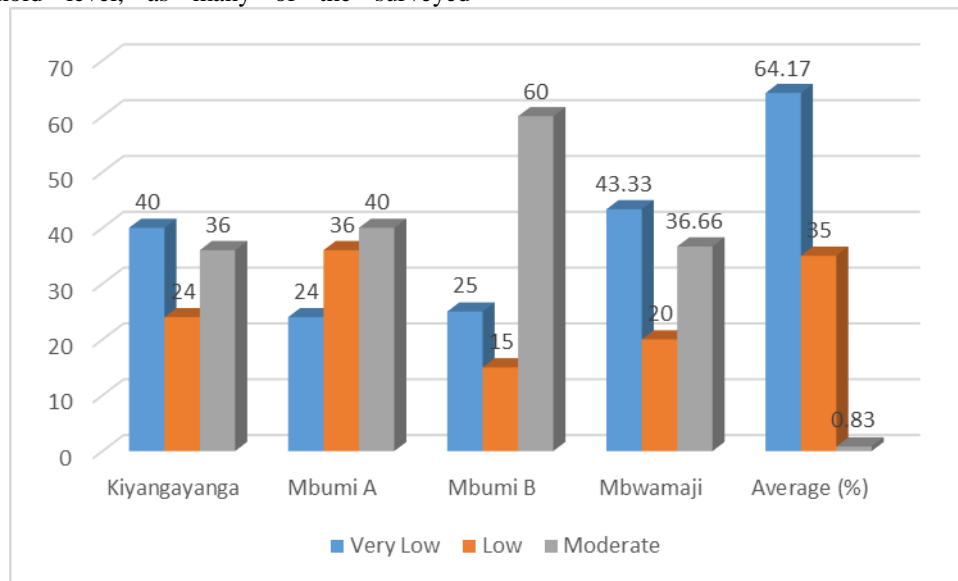


Figure 5: Level at which governance and institutional structures have succeeded to manage and control floods.

Respondents further revealed that, some of the activities like planting of reeds and trees, have been lacking monitoring and evaluation. Their views lines with the Village Chairperson of Kiyangayanga who cemented that;

“Activities are not active due to inadequate funding provided from the government and other stakeholders. This make some initiatives like afforestation to wind up before achieving the set up goals”.

Details for these challenges confronted performance of the governance and institutional structures, in managing and controlling floods are presented in sub-section 3.4 below.

3.4 Challenges faced governance and institutional structures

This study has found out that, governance and institutional structures were not much effective to manage and control floods because of challenges in place, including the delay of aids to flood victims. Others were bureaucracy, inadequate funding, and poor coordination of the stakeholders (Table 3).

Table 3: Challenges faced governance and institutional structures

Responses (%)						
Problems	Kiyangayanga (n=25)	Mbumi A (n=25)	Mbumi B (n=20)	Mbwamaji (n=30)	Total	Average
Inadequate of experts	16.00	4.00	10.00	6.66	36.66	9.16
Delay of aids	36.00	64.00	35.00	56.66	191.66	47.91
Poor coordination of stakeholders	28.00	0.00	10.00	6.66	44.66	11.16
Inadequate funding	12.00	16.00	20.00	13.33	61.33	15.33
Bureaucracy	8.00	16.00	25.00	16.66	65.66	16.41

n= sample size, (%) = percentage. Source: field survey data, 2017.

From these findings, delay of aids are the major problems which constrained governance and institutions efforts to tame floods. Respondents have claimed that, delays were present because of the long time taken to carry out needs assessment (evaluation), which were supposed to be done before distribution of aids.

Other factors for the delays, include the late mobilization of aids from stakeholders and inaccessibility of some areas. In this respect, people had the idea that, their life was not given priority.

The respondents have also claimed that, some aid providers favored their fellows (friends) firstly.

They further claimed that, those whom were against them politically, they were not considered and given priority in receiving aids even if they were worse affected. This scenario implied that, the political ideology or politicization had an influence in floods management and control.

With regards to bureaucracy, it was also reported to hinder smooth functioning of the governance and institutions interventions carried, to manage and control floods (Table 3). They reported that, there was a long process which had to be

followed in collecting information from the affected people, hence, delayed aids to reach the victims.

They also claimed that, their local leaders used to communicate flood problems on time, but the response from the higher levels tended to be slow because of bureaucratic procedures as each office had a limited mandate to take action in disasters.

This situation revealed that, the institutional structure linkages at upper and lower level was, in most cases, not in harmony mainly because among other factors, could be due to the usage of top-down approach in decision making. This situation lines with the views by Kaswamila & Malipula, (2013) that, local level institutional structures are treated as recipients of decisions made above, without consultation with them or with delay.

Respondents argued that, inadequate funding was similarly confounded effective operation of governance and institutions, in managing and controlling floods. This has influenced the failure of the governance and institutional structures, to meet the basic needs of the flood victims. Discussions with Ward and Village leaders disclosed that, sources of funding for flood management and control in the area were not source-specific as funding were mobilized from different stakeholders whom wished to contribute except for the central government through the Prime Minister's Office Department of Disasters, which has special fund for disasters. This mean that, flood victims were receiving less fund while they demanded more. This scenario implied that, funding for halting floods has been allocated reactively not proactively.

For this, it was difficult to mobilize adequate funding during floods due to disorganizations. The Tanzania Disaster Management Act put clearly the means to mobilize funding for disasters. These include sums as may be appropriated by the Parliament, voluntary by any person or organization, monies by way of donations or grants from within and outside the country, monies accrued by way of sale of donated items, proceeds from fund-raising (URT, 2015). Therefore, it is good that, collections and allocation of funds be done proactively.

It was also revealed from the results that, there was a poor coordination between the private and public institutions which involved in flood management and control. Private institutions which ventured assistances in flood management and control included Banks (CRDB, National Microfinance Bank-NMB), Bus Companies (Al-Saedy) etc. As for the public ones, there were the Ward and Village government offices and the Disaster Management Committees at Ward, Village and Sub-village levels.

These institutions were working independently without amalgamation of the overlapping activities, which might be classified into economic, technical, administrative, political and social-cultural categories. Each stakeholder also, had its own criteria to offer and distribute aids (eg. homeless and street children, children, single parents, elderly, isolated groups, etc.) in that, some flood victims got more assistance than others. This situation, has created a strata amongst flood victims and the communities at large and also reduced efficiencies, since the ability of reducing impacts of floods needed mutual efforts of the stakeholders (government and private institutions).

The assessment furthermore indicated that, there was a lack of disaster experts at the local level. This study has found out that, the Ward, Village and Sub-village leaders were merely political leaders whom had no a background in disaster management. This was similar to the Ward, Village, and Sub-village Disaster Committees. Chairpersons and members of these committees lacked a background in disaster management. It was also revealed that, none of the leaders and members of the committees had received any form of training in disaster management, floods in particular. They were working without disaster guidelines as a result, they failed to achieve the desired goals.

As already discussed, various actors were involved to manage and control floods. These brought with them experiences, resources, and technical know-how, which were left to the local community. Although the communities have a long list of local potential capacity, they still needed professionals/experts to advice in various aspects, in order to be able to smoothly implement the planned activities.

The lack of disaster experts, is also related to institutional failures to train experts. Currently there is no middle level disaster management training institutes in the country. The only institutions capable of training disaster experts are the Ardhi University and the University of Dodoma. However, the number of graduates is few compared with the country's demand.

IV. CONCLUSION

Results of the study have revealed that, there were some milestones which governance and institutional structures had achieved to manage and control floods. The improved aspects included communicating higher levels, distributing aids, and assisting the evaluation of the damages. However, despite the observed achievements, it was identified that, there were lack of disaster experts, bureaucracy, and poor coordination of the stakeholders.

Measures are required to solve weaknesses such as formation of the flood working plan, so as to increase the effectiveness in flood management and control, forming aids committee which would ensure time to time auditing of funds and other non-financial aids, located to the socio-economic projects on are spent, to recruit skilled and experienced people in disaster management and conservation, as well as strengthen security and safety committee at the local level.

It is similarly recommended that, there should be a network comprising the District Disaster Committee, local (ward and village/streets) disaster management committees, and local non-govern mental organizations, and local media.

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