
Effectiveness of Conservation By-laws on Enhancing Environmental Conservation in Kondoa District, Tanzania

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ABSTRACT

Environmental deterioration can exert pressure on the deprived livelihood and subject environmental resource to conflicts. Local communities residing within the proximity of natural resources bear the greatest brunt of the environmental devastation. However, the information on how environmental by-laws have some influence on enhancing conservation is scarce. This paper assesses the effectiveness of conservation by-laws in enhancing the environmental conservation in Kondoa District. Household survey, key informant interviews, observations, and documentary reviews were used in data collection from 120 respondents and 10 key informants. Findings indicate that 91.7 percent of the responses hold that there was a poor condition of environmental conservation before the introduction of conservation by-laws due to severe environmental pollutions, deforestation, soil erosion, and land degradation. It was further revealed by 97 percent of the responses that there were some improvements in conservation after introducing by-laws. Therefore, the local government in Kondoa District had to review the outdated clauses from the environmental conservation by-laws, and establish implementation strategies, as well raise conservation education among the local people.

Key words: By-laws, conservation, environment, Kondoa, natural resources

I. INTRODUCTION

Environmental management and conservation by-laws are one of the legal frameworks that have been enacted to enhance sustainable environmental

management and conservation practices, at the local levels globally (Solomon, 2010). This is due to the persistence of environmental devastations exacerbated by the increased human population, changing land uses, and the ever-increasing need for goods and services from the ecosystems (Paul, 2012). The situation entails the unsustainable usage of environmental resources, subsequently, the demand for environmental protection and restoration becomes crucial (Ezeizabarrena, 2002; Dovile and Vilmante, 2019).

Unsustainable usage of environmental resources needs regulations at all levels so as to have a balanced equality in access to and control of environmental resources in place and time. Furthermore, conservation by-laws are formulated with the aim of protecting environmental resources at the local levels, partly because most of the environmental resources are found at the local areas while most of the management and conservation laws are prepared through top-down approach. URT, (1997) and WSLRL, (2016) revealed that, local authorities represented the most dependable tier of the government, hence, they provided the most accessible channels for people to express their concerns, take actions, and create sustainable conditions. Since many of the environmental problems and solutions have their roots in the local activities, local authorities are a determining factor in implementing environmental by-laws.

Furthermore, environmental conservation by-laws have been enacted with the intention of strengthening partnership between the central governments and the local authorities, in the management and conservation of the environmental resources (Willy, 1997; Pallangyo, 2007; WSLRL, 2016). Moreover, granting people the right to manage and conserve their resources locally, constitutes a starting point, which likely strengthens democracy, participation, and active empowerment of the people in the process of sustainable environmental development (Goldstein, 2005; Dovile and Vilmante, 2019).

However, it is important that we consider how environmental by-laws can influence the efforts made in the management and conservation of environmental resources. Generally, as observed by Swallow *et al.*, (2006) through by-laws, formal authority shifts from the national conservation agencies to the decentralized multi-stakeholder communities and local user groups.

In Tanzania, at the national level the government assign conservation mandates into the central and local governments. The central government includes Ministries, parastatal organizations (Tanzania National Parks and Ngorongoro Conservation Area Authority) and independent departments, while the local government includes District Councils, Wards, and Village Councils (MNRT, 2007).

According to the Tanzania Environmental Management Act (URT, 2004), the role of the central government is to articulate a clear national policy and regulatory frameworks for the promotion, protection, and a sustainable management of the environment in Tanzania. On the other hand, local government authorities are responsible for implementing the Act. District Councils, Wards and Village Councils, have a role of providing a regulatory extension services and lead other agencies, in the implementation of the Act in their areas of jurisdiction through formulating and enforcing by-laws, providing technical support and conservation education to villages, and preparing a sound physical and development plans which protect environmental resources.

As calls to formulate by-laws have been vested to the local authorities, the efforts of formulating and enforcing environmental conservation by-laws have been in place in most of the Districts and Village Councils in Tanzania (URT, 1999). In Kondoa District (Dodoma region), there are conservation by-laws which govern local peoples' interactions with environmental resources. Conservation by-laws were adopted in 1982 and revised in 2012 in Kondoa District. These conservation by-laws, govern the management and conservation of environmental resources at the District, Wards, and Village levels. The principal assumption that conservation initiatives start and operate at the local level is more likely to succeed than rules and laws imposed from the top. This research specifically seeks to (i) Assess the status of environmental conservation before and after having environmental conservation by-laws, and (ii) suggest the way forward of strengthening the performance of conservation by-laws for the conservation of environmental resources.

2. Materials and Methods

The study area

This study was conducted in Kondoa District. Four villages (Kidongo Cheusi, Poise, Bicha, and Wisikwantisi), were selected for the study. The district lies between

4° 54' 23' S and 35° 46' 4' E. It is also between 1650-2000 meters above the sea level with hills and escarpments separated by flat or gently undulating land (Mung'ong'o et al., 2004). The district has Miombo woodland forests with *Brachystegia* being the most common woody genus (Mung'ong'o et al., 2004). The criteria for the selection of the study area include presence of diverse social characteristics, presence of conservation by-laws, presence of various environmental resources, and accessibility.

Data collection and analysis

The target population in this study encompassed household members (aged ≥18 years old) and the leaders (Ward Executive Officers, Village Heads, District Natural Resource Officer and the Chairpersons of the Village Environmental/Natural Resources Committees). The sampling frame for this study involved households listed in the village registers, lists of respective district and village/ward specializations registers, and the respective registers in both public and government institutions.

Data for this study were collected through household questionnaire surveys, key informant interviews, field site visits, and documentary reviews. Face to face administration of questionnaires was done to 120 households who were randomly sampled from the village register books. Four field research assistants were recruited from each village and were also used in the pre-testing of questionnaires. In each household, one member aged ≥18 years was picked for filling the questionnaires. Questionnaires covered the effectiveness of conservation by-laws before and after the formulation of the same, socio-economic characteristics of the respondents, factors affecting implementation of the by-laws, and measures needed to strengthen implementation of the conservation by-laws.

Structured interviews were also held with 10 key people in the study area and these included the Ward Executive Officer, Village Heads, District Natural Resource Officer, and the Chairpersons of the Village Environmental/Natural Resources Committees. These were involved due to the experience they had in the management of local authorities, their positions, and conservation issues. Interviews were guided by the checklists. Checklist issues included available conservation by-laws, the trend of conservation before and after having conservation by-laws, factors influencing performance of the conservation by-laws, and the way forward of strengthening performance of the by-laws.

Four field site visits were also planned in all the four study villages. Visits were meant to assess and/or observe the actual situation in the field regarding the natural resources conservation. Field site visits were organized in collaboration with both wards and village leaders.

A review of a series of both published and unpublished documents related to the topic under study was also accessed. Archive information helped to triangulate and broaden information gathered from the primary data. The archive information included reports, debates, local government records, and conceptual materials.

Most of the collected data were of a qualitative nature, which necessitated the usage of qualitative data analysis such as content analysis and memoing. Statistical Package for Social Sciences (version 16.0 for Windows) was used in the analysis of data particularly from household questionnaires. The analyzed data were presented in different forms such as tables, frequencies, and graphs.

3. RESULTS AND DISCUSSIONS

Respondents socio-economic characteristics

The results show that males were more than females by 54.5 (n=120) and 45.5 percent respectively. This situation could have happened by chance. As for the ages, the results revealed that, 89 percent of the respondents were aged between 18-60 years old. This implies that majority of the respondents were economically active to pursue economic activities and involved in conservation. Regarding education level, majority (67%) of the respondents had primary education for the reasons that there were limited secondary schools and also due to the influence of cultural background, whereby parents were satisfied with their children attaining primary school education. This indicated lower levels of literacy on issues demanding more understanding and for a concrete analysis. In terms of economic activities, agriculture was the main economic activity in all the four villages and which on average, was practiced by 73.4 the respondents of the population (Table 1).

Table 1: Socio-economic characteristics of the respondents

Villages	Sex %		Age %			Level of education %				Economic activities %		
	M	F	18-35	36-60	>60	IE	PE	SE	AS	AG	LI	EM
Kidongo Cheusi	63	37	50	33	17	33	47	10	10	73	17	10
Poise	53	47	30	60	10	3	80	10	7	69	23	8
Bicha	48	52	20	70	10	2	77	19	2	70	24	6
Wisikwantisi	54	46	30	63	7	14	64	17	5	76	20	4
Total	218	182	130	226	44	52	268	56	24	288	84	28
Average	54.5	45.5	32.5	56.5	11	13	67	14	6	72	21	7

M=Males, F=Females, IE=Informal Education, PE = Primary Education, SE = Secondary Education, AS=Above Secondary, AG=Agriculture, LI=Livestock, EM=Employed.

Status of conservation before (1980's) having environmental conservation by-laws

The status of conservation before having by-laws was assessed. Results have shown that on average 91.7percent of the respondents were of the view that the status of environmental conservation before the enactment of conservation by-laws (1980's) was not good, entailing that there was deterioration of the environmental resources in place at that time (Figure 1).

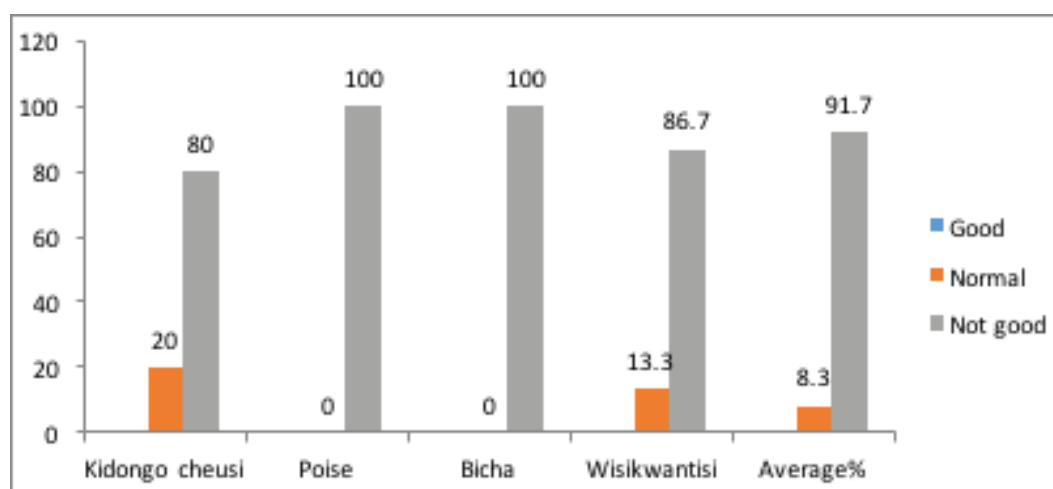


Figure 1: Status of conservation before having environmental conservation by-laws.

Furthermore, the respondents were asked to give reasons as to why conditions of environmental conservation were not good before the enactment of the by-laws. The results indicated that the reasons provided by them encompassed a devastated environment, which was associated with severe deforestation, soil erosion, pollution, and land degradation (Table 2).

Table 2: Views of conservation problems before having conservation by-laws

Responses %

Villages	Pollu- tions	Deforesta- tion	Land degrada- tion	Bush fires	Soil erosion
Kidongo Cheusi	16.7	58.3	13.4	8.3	3.3
Poise	17.2	29	27.7	3.8	22.3
Bicha	3.3	39.1	43.3	1	13.3
Wisikwantisi	20	36	23.3	4	16.7

The respondents' views on the state of conservation before the introduction of the environmental conservation by-laws, concur with the information provided by key informants. During the interview, Kondo District Natural Resource Officer had this to say,

“...real most of the environmental problems in our district before the enactment of by-laws were soil erosion, land degradation, and deforestation. It was the time that everyone used resources without thinking about the others and the future generation.”

Regarding deforestation, for instance, the Officer reported that, forests were cleared due to charcoal burning, firewood, and the encroachments for both farming and grazing. Furthermore, the Bicha Village Chairperson had this to say;

“An excessive cutting of trees in our areas was due to slash and burn farming, which was a popular practice, as well hunting of wild animals including birds, and for building purposes.”

These views imply that forest resources on the unreserved land could be under enormous pressure, from the expansion of agriculture, livestock grazing, fires, and other human activities due to lack of proper management.

Similarly, environmental pollutions, were reported by 14 percent of the respondents as a problem before the enactment of environmental conservation by-laws. Respondents' views were in line with the findings in a study by Mung'ong'o, (1995) and Mbegu, (1998) who asserted that water pollution, land pollution, and air pollution due to charcoal making, livestock grazing, and slash and burn farming system, exacerbated environmental pollutions in Kondoa District. In practice, these problems existed in the study area because there were no regulations at the local level of controlling access to natural resources and make people abide by environmental conservation practices. In Poise village, a natural spring for instance, by sharing the resource between livestock and people led to pollution, siltation, and its disappearance. Similar situation was also observed in Kidongo Cheusi.

Meanwhile, soil erosion was mentioned by 14 percent of the respondents as a problem before having the by-laws. This finding was also in line with the records from "Hifadhi Ardhi Dodoma" (HADO) that, showed soil erosion was exacerbated by overgrazing and poor farming practices without regulations on access and control over land resources. This information was consistent with the previous report by Wenner, (1983), Mbegu (1996), and Mwakipesile, (2014) showing that, soil erosion was a severe conservation challenge in Kondoa District due to various reasons, including lack of adoption of various land conservation measures such as tree planting, contour farming, and zero grazing.

Land degradation also was reported by 27 percent of the respondents as existing before having by-laws. Records from HADO maintain that land degradation was exacerbated mainly by overgrazing, soil erosion, slash, and burn farming system, and charcoal burning. these practices reduced fertility, which was easily eroded by the wind as a result. The factors leading to land degradation are similar to the findings reported in a study by Mung'ong'o, (1995) and Christiansson, and Kikula, (1996).

Status of conservation after the enactment of environmental conservation by-laws

The respondents' views on the status of conservation after the enactment and operation of environmental conservation by-laws were assessed. The results indicated that 97 percent of the respondents revealed that the status of conservation has improved after having the environmental conservation by-laws (Figure 2).

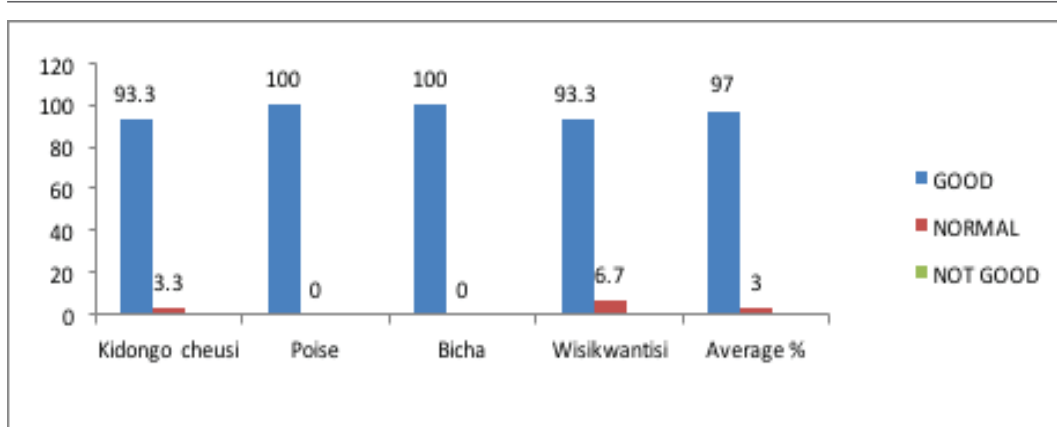


Figure 2: Status of conservation after having environmental conservation by-laws.

Furthermore, the respondents were requested to mention and explain reasons for the improvements in conservation after having by-laws. The reasons provided, include the reduction of the intensity of environmental devastations, which were severe before having by-laws. Moreover, conservation devastations, which were reported by the respondents to have improved after having environmental conservation by-laws were explored. The respondents had the opinion that excessive pollution, deforestation, encroachment, land degradation, and soil erosion were mitigated when compared to the situation before having environmental conservation by-laws.

The respondents' views on the improvement concur with the results of recent studies in Kondo District (e.g. Kabula, 2014; Mwakipesile, 2014; Mwakipesile, 2015). For example, a report by Kabura, et al., (2014) revealed that, the intensity of anthropogenic factors led to the reduction of deforestation in the district. The reasons for these improvements encompassed the presence of land degradation control measures such as destocking, contours and ridges farming, and tree and forest planting (Ligonja, and Shrestha, 2015; Mwakipesile, 2015).

Likewise, information from the Department of Natural Resources in the district suggests a reduction of encroachments to the water sources, reduction of the dumping of solid wastes including plastic bags, and the reduction of uncontrolled charcoal burning. These results, therefore, maintain a substantial improvement in conservation compared to the situation before the enactment and operation of the by-laws.

The results indicate further that there were aspects that were associated with the enactments and operations of the by-laws that enhanced the improvements

in conservation. Discussions with Kondoa District Natural Resource Officer revealed that, the usage of fines to people involved in resource mismanagement were effective. For example, section 8 of the by-laws punishments states that, "...if someone set a fire in the forest have to pay a fine of not less than Tsh. 10,000/= and not exceed Tsh. 50,000/= and have to pay compensation for the damages. Section 5 of the by-laws punishments also states that, "Livestock which will be found by the officer or patrol unit in the forest reserve without permit, the officer or patrol unit have to take the livestock to the village government office"

In addition, discussions with Ward Executives maintained that the presence of conservation patrol groups in the study area had revitalized conservation. Jumuiya ya Hifadhi Mazingira Tarafa ya Berekona Kolo (JUHIBEKO), was one of the conservation patrol groups reported to operate in the area. Patrol guards were trained by the African Wildlife Foundation (AWF) and Village Natural Resources Committee (VNRC) members who were involved in patrolling activity.

As observed by Karidozo and Osborn, (2007), a well-funded and equipped conservation patrol units are instrumental in environmental conservation. Meanwhile, Ringo and Kaswamila, (2014) emphasized that a strong conservation patrol units were decisive tools in thwarting bushfires, encroachment, poaching, and deforestation. Furthermore, discussions with the Chairpersons of the Village Environmental/Natural Resources Committees disclosed that, the presence of posters around forest reserves and water sources alerting about punishments encompassed in the by-laws were also instrumental in raising local peoples' awareness about the by-laws, hence, improved conservation.

Suggestions for improving performance of the environmental conservation by-laws

The respondents and key informants were asked to suggest mechanisms, which could make the governing by-laws more effective. They suggested awareness rising on by-laws, establishment of by-laws implementation strategies, and a review of conservation by-laws fines (Table 3) as suitable mechanisms..

Table 3: Suggestions for improving environmental conservation by-laws

Responses %				
Villages	Awareness on by-laws	rising	By-laws implementation strategies	Review of by-laws fines
Kidongo Cheusi	54	2	7	19
Poise 3	9		33	28
Bicha	20	4	7	33
Wisikwantisi 3	7	2	6	37

The results revealed that, 37.5 percent of the respondents had the views that awareness on conservation by-laws was important to them. In practice, by raising awareness among the local peoples on conservation by-laws was crucial in enhancing performance of the by-laws and in achieving a sustainable environmental conservation. As Nyahongo (2010) argues, formulating and implementation of conservation regulations were instrumental, besides it sounds effective if people whom regulations were made for, were well acquainted about those regulations. similarly Kaswamila and Mrisho, (2013), were of the view that natural resources management and conservation policies and/or legislations in Tanzania are formulated without the involvements of local communities and at times, documents were rarely accessible and where accessible they were always in English, which is not a user-friendly language for the intended stakeholders. Further, as empathised by URT (1997), for effectiveness, environmental laws and by-laws must be understood by the people to whom it was aimed. According to Ngailo et al., (2007), awareness education is an instrumental tool in one's efforts of eradicating the prevailing problems, as she/he could apply her/his level of awareness to initiate alternative options easily an opposed to a person with low level of awareness. In this situation, awareness raising on the conservation by-laws should be provided to the people in the study area. This could be implemented through village meetings, seminars, and workshops at the local level by conservation extension officers.

Furthermore, the study revealed that, 33.25 percent of the respondents were of the view that the by-laws implementation strategies were vital in enhancing conservation. Having conservation by-laws implementation strategies, was a crucial

in meeting the goals of attaining effective environmental conservation. This enables the authorities to raise public awareness on conservation aspects stipulated in the by-laws.

It is crucial to involve local people in the formulation of conservation by-laws and implementation strategies so as to make strategies user friendly to the local people as ascertained by Kaswamila and Mrisho, (2013). In the same way, this makes the formulated strategies the product of the local people, who interacted daily with their surroundings, hence, it becomes easy for the local people to abide by them. More broadly, local community participation is regarded as one of the cornerstone for good governance. It helps to enhance accountability, transparency and ensures sustainability of development or any related initiatives. The significance of community involvement has also reported elsewhere by Thanyani, (2014).

Reviewing and amending outdated issues is important in strengthening the effectiveness of the by-laws. The existing conservation by-laws were last reviewed and amended in 2012. Issues such as a fine of Tsh. 10,000/= (\$ 4), is currently smaller than the damages that a person may inflict on the environment. Some of these are outdated and/or are not realistic from the point of view of the local culture and practices and the changing of socio-economic and political context. In this scenario, amending environmental conservation by-laws is crucial.

Conclusion

This study indicates that people in the study area perceived the usage of conservation by-laws as a practical means for environmental conservation, which could subsequently reduce environmental detriments. By-laws were reported to be effective on enhancing improvements in conservation, as there were signs of successes. These signs ranged from the reduction of the severity of pollution, land degradation, soil erosion, and deforestation.

Recommendations

In practice, the reduction of these conservation havocs was principally attributed by the usage of punishments and patrol units, which are encompassed in the by-laws. Hence, the study recommends that, Kondoa District Council together with lower level local government authorities (i.e. village governments) initiate measures

that would geared at sustaining conservation by-laws that proved successful in the area. This, should be done through rectifying and filling in the gaps that existed such as participation of local communities in decision-making, enhancement and strengthening of conservation extension services at the village level. The measures put in place should be based on what people wanted and could afford from the environment.

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