Quality Assessment on Environmental Conservation Interventions in three Selected Councils of Dodoma Region, Tanzania

Gaspar Peter Mwananchipeta Mwembezi[1]

Abstract

The study highlights some of conservation challenges, quality strategies and interventions that could be enhanced for sustainable eco-development. The study area has one of the most degraded environments in Tanzania. The statement of the problem is that, while progress has been made to a certain level on environmental conservations programme, this change in terms of quality has not been investigated and assessed. A case study design was adopted in which a population of **629** respondents was involved. In this Study the population was used as sample hence Census technique, not sampling. Distribution of respondents for data collection was in four groups and divided into two categories which included intervention designers **215** and intervention implementers **414**. Data analysis by using SPSS and descriptive statistics were used to meet the case. Major findings include; poor use of natural resources, lack of adequate knowledge and knowledge dissemination, financial constraints and conflict of interest among stakeholders. Therefore, it is recommended that, ongoing interventions to environmental conservation should be refined and strengthened for quality and sustainable way.

Key words: Quality, Intervention, Environment, Conservation, Efficiency, effectiveness

[1] President's Office, Public Service Management, Utumishi House, 8, Kivukoni Road, 11404, Dar es salaam, Tanzania

Introduction

Globally, environment sums up a total of all surroundings of a living organism, including natural forces and other living things, which provide conditions for development and growth as well as of danger and damage (URT, 2005). Therefore, the development on environment involves systematic use of scientific and technical knowledge to meet specific objectives and requirements which involves economic and social transformation that is based on complex cultural and environmental factors and their interactions and hence, eco-development (Lusambo, 2009). There are three types of environment which are Physical environment, Social or Cultural environment and biotic environment Jane, *at el,* (2006). The main focus of this study is on Physical environment.

Pezzy and Toman, (2002) argued that, the concepts of environment and development provide a nice summary of the economic literature on sustainable development. The difference revolves around the question of whether substitution between human made capital and natural resources are limited (if so, then the focus is on strong sustainability) or unlimited (the focus is weak sustainability). World Development Report, (2011) sensed that, if you chop down the forest and sell the trees there is only a positive impact on Gross National Product. That is, you sell it today, you can't sell it tomorrow, so you take away tomorrow's GNP to increase today's. Plus may be you chop down the trees and the environment runs off, also losing future potential GNP.

In sub-Saharan Africa, the understanding of the complexity of environmental protection and poverty reduction can envisage that African peoples should not only be able to live in a thriving and unpolluted environment, but also, be able to access the resources provided by their environment which allow them to develop to their full potential. In essence, the human right to a general satisfactory environment under the law is a composite right, and thus, measures taken to protect the environment in terms of this right must also promote poverty reduction and socio-economic development (URT, 2008). Growing environmental concern is a result of its degradation. Population growth, size, and spatial distribution have had an impact on the environment in multiple ways and environmental degradation has important implications for the well being of populations. As the world population grows fast, the pace of urbanisation accelerates unabated the resource depleting technologies, lifestyles that generate excessive wastes, and economic practices that are often at odds with environmental conservation and sustainable development are exerting adverse effects on the atmosphere, lands and forests, minerals and energy resources, oceans and quality of life (URT, 2004). Thus, the need to redress environmental development nexus is imperative to ensure sustainable environment is achieved amid escalating demand for resource use mainly from the environment. One of the entry point to ensure successful environment – development nexus is through empowering the institutions that work so closely with the people, mostly the poor and which include the local governments.

Selection of Dodoma as study region was guided by Carissa *et al.,* (2005) who carried out a deskwork (based on an extensive literature review) to identify the regions within the country where critical ecosystem services for human well-being are stressed, signaling the need for immediate attention. Development in those selected councils involves environmental use which should not ignore the question of environmental conservation interventions. The main objective this study was to assess the environmental interventions by local government authorities on quality of environment conservation interventions since 1980s to 2010. It is a long line of thinking that, the study is seen as being of interest to be

useful in generating some new information and knowledge in environmental conservation initiatives. However, Researches and scholars may use the findings of this study as a point of departure for further studies in the environmental conservation settings. The best practice revealed that, despite many efforts that have been made by local communities, central government, non-governmental organisations and other interested parties such as DONET, HADO, EGAJ, MIGESADO, CDA/JOVC, DOVEP, CSOs and other Development Partners (URT, 2008) still the quality is minimal.

Administratively, Dodoma region covers an area of 41,310 km^2 equivalent to 5% of the total area of Tanzania Mainland. It is located in the heartland of Tanzania and it is divided into seven districts as indicated in table 1 below

DISTRICT	MALE	FEMALE	TOTAL
Kondoa	136,518	269,704	269,704
Mpwapwa	147,306	157,750	305,056
Kongwa	149,221	160,752	309,973
Chamwino	158,882	171,661	330,543
Dodoma, MC	199,487	211,469	410,956
Bahi	105,975	115,670	221,645
Chemba	117,585	118,126	235,711
Total	1,014,974	1,068,514	2,083,588

Source: NBS, (2012)

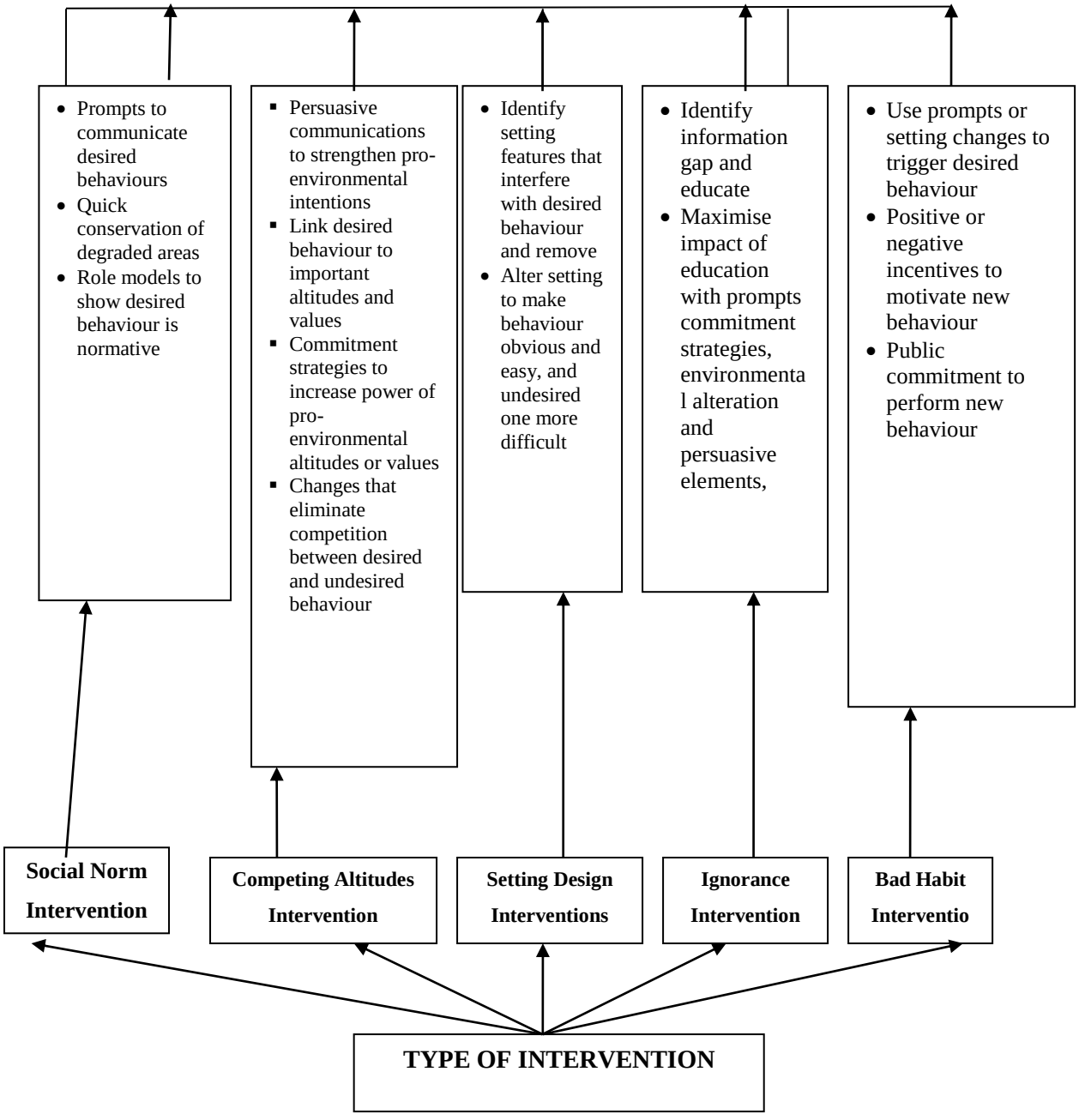
The region lies at 4º to 7º latitude South and 35º – 37º longitude East. The region is centrally positioned in Tanzania and is bordered by four regions namely: Manyara in the North, Morogoro in the East, Iringa in the South and Singida in the West. Much of the region is a plateau rising gradually from some 830 metres in Bahi Swamps to 2000 metres above sea level in the highlands north of Kondoa (URT, 2002). The annual rainfall ranges from 600 mm in lowlands to 1200 mm on the highland plateau. However, there are areas which experience exceptional droughts (with less than 600 mm of rainfall). The mean annual temperatures vary with altitude from the valley bottom to the mountain top: between 18ºC on the mountains to 30ºC in river valleys and 25ºC in most parts of the region. The economy of the region is dominated by agriculture though livestock keeping, fishing and mining are also common economic activities include; small scale farming; cattle production; traditional fishing and some mining activities (URT, 2012). Nonetheless, unpredictable weather conditions, natural disasters are serious factors to environmental destruction and extinction of flora and fauna.

The councils selected were Dodoma municipality, Chamwino and Kondoa district councils. These were the districts experiencing environmental problems such as environmental degradation including environment erosion, severe and chronic shortage of water for humans, livestock and agriculture, extensive deforestation and overgrazing, low level of alternative sources of domestic energy as substitutes for charcoal and fuel wood were blamed as drivers of environmental degradation. Other factors which also influenced the choice of these district councils were poor living standards, low level access of other social services; environmental pollution and loss of wildlife habitat and biodiversity (URT, 2010). These factors ought to complicate people's contribution to environmental conservation hence dwindling of ecosystems goods and services.

A Conceptual Framework

This conceptual framework was used to reflect the study variables in the study area. This conceptual framework acts as a basis for discussing key issues related to environmental interventions, conservation and exploitation.

Figure 1.1: A Framework for Understanding Environmental Conservations



Source: Researcher, 2014 modified from Burn, and Winter, (2007)

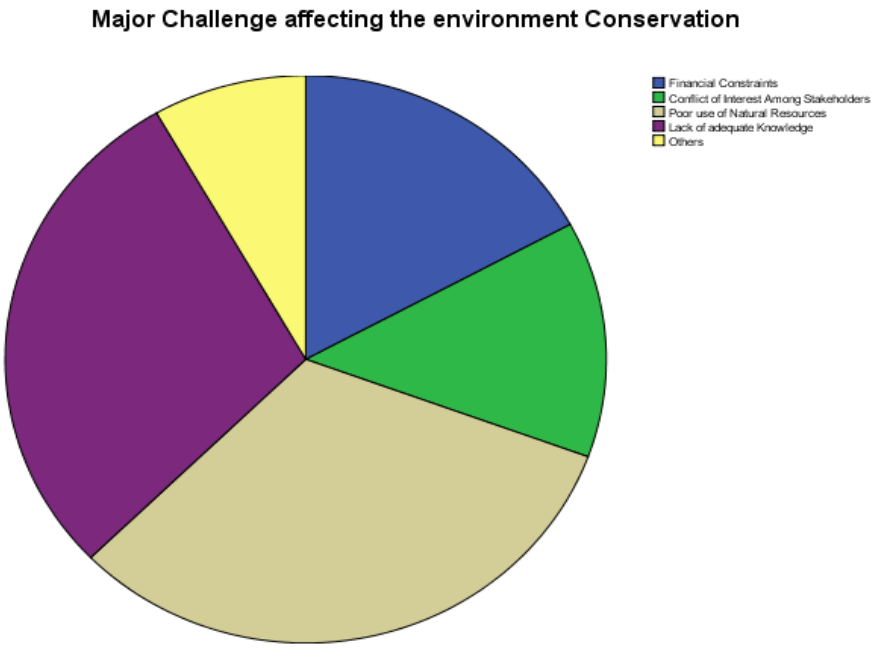


Table 2: Major Challenges Affecting Environmental Conservation from each Council

	Major Challenge	Dodoma M'Council		Kondoa D'Concil		Chamwino D'Concil	
		Frequency	%	Frequency	%	Frequency	%
1	Financial Constraints	31	14.8	31	17.8	27	19.9
2	Conflict of Interest Among Stakeholders	12	5.7	33	19.0	25	18.4
3	Poor use of Natural Resources	72	34.3	60	34.5	35	25.7
4	Lack of adequate Knowledge	77	36.7	39	22.4	35	25.7
5	Others	18	8.6	11	6.3	14	10.3
	Total	**210**	**100.0**	**174**	**100.0**	**136**	**100.0**

Source: Developed by the Researcher, 2014

These results from Table 2 show that, for Dodoma Municipality the leading major challenge is 'lack of adequate knowledge' (36.7%), followed by Poor use of Natural resources (36.4%). For Kondoa District Council, the leading challenge is 'Poor use of Natural resources' (34.5%) followed by 'lack of adequate knowledge' (22.4%) while for Chamwino District Council, the leading challenge is 'Poor use of Natural Resources' (25.7%) and lack of adequate knowledge (25.7%). Therefore, from two Councils (Kondoa and Chamwino), the leading challenge is Poor use of Natural resources. This is because it has the highest percentage compared to other major challenges identifies by the respondents in this two Councils whereby, for Dodoma Municipality is lack of knowledge. This implies that the interventions to be done should focus more on the optimal use of Natural resources and knowledge dissemination. It is also evident that from all the three Councils, the next major challenge is lack of adequate knowledge about the environment conservation. This implies that the environmentalists of Dodoma need to address these two challenges more aggressively in order to sustain the environment conservation in the Region.

Importance of Interventions in Predicting the quality of Environment Conservation

There are five environmental interventions studied on how the affect the prediction of the quality of conservation. The set of interventions are; Social Norms Interventions, Competing Attitudes, Interventions, Setting Design Interventions, Ignorance Interventions, Bad Habit Interventions. The quality of these sets of interventions was assessed by assigning the following codes for the respondents to respond; Very Poor, Poor, Moderate, Good and Very Good. These five interventions form the components of independent variable of this study. The dependent variable is 'the overall quality of environment conservation'.

Significance of the Interventions on Conservation in General

The dependent variable was 'Environmental Management Intervention' to be regressed against quality of conservation. A regression model was used to find out the interventions which are statistically significant in predicting the overall quality of conservation in general as well as for the specific Councils. The general linear regression equation is given as;

$Y = a + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + e$

Where;

a = constant

X_1 = Social Norms Interventions, X_2 = Competing Attitudes Interventions

X_3 Setting Design Interventions, X_4 = Ignorance Interventions, X_5 = Bad Habit Interventions.

β_1 to β_5 = Regression coefficients, e = standard error of the estimate. The results for the regression analysis for the responses in general are given in Table 3 below.

Predictor (*Type of Intervention)*	**β**	**t**	**p-value**
Constant	2.0	9.12	0.000
Social Norms (X_1)	0.22	5.61**	0.000
Competing Attitudes (X_2)	0.12	3.04**	0.002
Setting design (X_3)	0.17	4.31**	0.000
Ignorance (X_4)	0.16	4.12**	0.000
Bad habit (X_5)	-0.37	-9.33**	0.000

** Significant at 1%, ns = not significant

From the results, the regression equation for the overall quality of conservation (Y) in general was obtained as;

$Y = 2.0 + 0.22X_1 + 0.12\ X_2 + 0.17\ X_3 + 0.16\ X_4 - 0.37\ X_5$.

The coefficient is said to be statistically significant if its P-value is less than 0.05. From the results on Table 4.3, p-value for all coefficients of regression is less than 0.05. This implies that in answering the second research question all five mentions interventions are important in predicting the quality of environment conservation in Dodoma Region.

Assessment of Environment Conservation by Intervention Designers and Implementers.

A comparison has been done in order to find out of the assessment of these two categories of respondents is statistically significantly different. The assessment values given to the respondents to assess the quality of environment conservation were as follow;
1 = Very Poor, 2 = Poor, 3 = Moderate, 4 = Good, 5 = Very Good.

Comparison of Conservation in General
The analysis techniques used was t – test. The decision rule for this is that, the assessment will be considered to be statistically significantly different if the p-value is less than 0.05 for the t-value. Results for analysis of t-Test are given on Table 4 below.

Respondents	**Mean**
Intervention Designers	2.96
Intervention Implementers	2.99
t-value	-0.42
P - Value	0.676

Source: Determined by the Researcher, 2014

With the t – value of -0.42 at p-value of 0.676 it implies that the means of the two samples are not statistically significantly different. This implies that the assessment of the quality of conservation by Intervention Designers is not statistically significantly different from the assessment of Intervention Implementers. The mean gap score for designers is 2.96 (59.2%) while for the Implementers is 2.99 (59.8%). (The score are on the scale of 5 from a likert scale). Therefore in addressing the third research question, the assessment of the conservation quality by designers and implementers of interventions is not statistically significantly different.

The Leading Strategy on Improving the Environment Conservation
Respondents were given an open ended question to mention a major strategy which they think suffices to improve the conservation. Several responses were given by all respondents but they are grouped to four major responses and the few which could not fall on the four were considered as others. The responses were coded for analysis as follow; Enhance Community Awareness, Improve Law enforcement, Training of Intervention Stakeholders, Improve Monitoring & Evaluation Systems and Others. The analysis techniques used in this case is Frequencies and Percentages. Results of the responses on the major strategy to improve the quality of conservation are given on Table 5.

S/N	**Strategy**	**Frequency**	**Percent %**
1	Enhance Community Awareness	275	52.9
2	Law Enforcement	50	9.6
3	Training to intervention Stakeholders	129	24.8
4	Improve M& E Systems	45	8.7
5	Others	21	4.0
	Total	**520**	**100.0**

From the results on Table 4, the leading major strategy is 'Enhance Community Awareness (52.9%). This implies that the management of the councils ought to consider proper campaigns to create awareness to their respective communities. This is followed by the need for training the intervention stakeholders (24.8%).

The Leading Strategies by Specific Council

Table 6: Shows Major Strategy to Improve Conservation from each Council.

	Major Strategy	Dodoma M'Council		Kondoa D'Concil		Chamwino D'Concil	
		Frequency	%	Frequency	%	Frequency	%
1	Enhance Community Awareness	115	54.8	85	48.9	75	55.1
2	Law Enforcement	22	10.5	16	9.2	12	8.8
3	Training to intervention Stakeholders	52	24.8	46	26.4	31	22.8
4	Improve M& E Systems	14	6.7	17	9.8	14	10.3
5	Others	7	3.3	10	5.7	4	2.9
	Total	210	100.0	174	100.0	136	100.0

This result reveals that, the leading strategy in all the three councils is 'Enhance Community Awareness'. This is because for Dodoma Municipal it is at 54.8%, Kondoa District Council (48.9%) and Chamwino District Council (55.1%). The ranking from each Council happen to be consistent with the overall ranking as given on Table 4.5. Therefore, in addressing the fourth research question, the leading major strategy to improve environmental conservation based on each council is to enhance the awareness of the community.

Summary

The study area has one of the most degraded environments in Tanzania. The findings revealed further, a statistically significant difference among councils in the exploitation of natural resources. This suggests that it is more plausible to address natural resource exploitation issues separately: a one-size-fits-all approach in addressing natural resource related problems is likely to be futile. Council's specific strategies should be devised to address the current natural resource exploitation problems. As depicted by the present study, those councils in the study area are economically and forests poor. This suggests that, any strategy aimed at providing alternative sources of reducing the wood fuel consumption should be affordable by all members of the community; and should be buttressed by poverty reduction activities.

Conclusions and Recommendations

The study has made a number of key contributions and has painted a detailed and explicit picture of environment conservation interventions in Dodoma Region. It has generated information that can be used as baseline data by later studies. The predictive model used is

undoubtedly an imperative tool for natural resource management in general and sustainable environment management in particular. The descriptive modeling conducted in this study has highlighted socio-economic and demographic variables which when manipulated can influence changes in environmental exploitation.

A number of factors found as a most part of the major environmental problem in those councils. According to the environmental Profile of Dodoma Region, so far 385.5 hectares have been eroded and it is estimated that every year up to 10 mm of environment is removed URT, (2011). This has implications for the peasants using this land for agricultural activities. Productivity is reduced leading to regular food shortages in the area. In terms of plans and coordination of environmental conservation programme. It was found that there is a strategic intervention for environmental conservation in those selected study Councils. But co-ordination of environmental activities including planning and implementation is inadequate. This can be evidenced from environmental conservation agents as each agent uses its own approach. The study now has revealed that, those Councils are still facing many environmental problems. There are positive actions that have been taken in addressing these problems through the participation of many agents in those areas. For example, trees have been planted, destocking efforts have been made, by-laws have been enacted, and environment education has been given to communities and many others. Despite these efforts, still Dodoma Municipality, Chamwino and Kondoa District Councils have a long way to go to ensure that sustainable environmental conservation is achieved.

Recommendations

In view of the major findings and conclusions of the present study, the following recommendations are highlighted. Policies are needed which enable those councils to adopt and protect themselves in a rapidly changing and usually hostile socio-economic environment. At all levels from central to the grassroots should invest more on improved consumption of natural resources. Environments have to be managed in terms of socio-economic, ecological and cultural sustainability or, in other words, in accordance with principles of multi-functionality and equitable benefits. Other stakeholders have equally important roles to play in improving environment services where; the researchers should assist invest more in promoting eco-development to conform to various social and cultural preferences; the mass media are critical in awareness creation.

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