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INFLUENCE OF CLIMATE-PROOFED INFRA STRUCTURE ON IMPLEMENTATION OF DROUGHT MANAGEMENT STRATEGIES BY THE NATIONAL DROUGHT MANAGEMENT AUTHORITY IN TAITA TAVETA COUNTY, KENYA

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ABSTRACT-*Climate proofing is the identification of risks to a development project as a consequence of climate variability and change, and ensuring that those risks are reduced to acceptable levels through long lasting and environmentally sound, economically viable, and socially acceptable changes implemented. Drought management strategies are influenced by climate proofed infrastructure in various ways like: project risk screening and scoping; impact assessment, vulnerability assessment; adaptation assessment; implementation arrangements; and monitoring and evaluation.*

However, climate proof infrastructure as a drought mitigation strategy has not received sufficient research attention and since climate is variable over different contexts especially with the present situation of climate change. Therefore, the objective of this study was to examine the influence of climate-proofed infrastructure on the implementation of drought management strategies in Taita Taveta County, Kenya by the NDMA. Therefore, this study sought to establish the influence of climate-proofed infrastructure on the implementation of drought management strategies in Taita Taveta County, Kenya by the National Drought Management Authority. A sample of 81 employees of National Drought Management Authority in Taita Taveta County was interviewed. Data collected was analyzed using descriptive analysis methods. The study found that climate proofed infrastructure significantly influenced the implementation of drought management strategies. The study recommends that,the NDMA in the area should also install early warning systems and adopt risk management strategies to enable it identify risks to a development project as a consequence of climate variability and change, and ensure that those risks are reduced to acceptable levels. Finally, there is need for the organization to forge political goodwill from the local and national political actors.

KEYWORDS: *Climate Proof, Infra structure, Drought Management, Strategies, Implementation*

1.0 INTRODUCTION

1.1 Background of the study

Drought is a complex, pervasive natural hazard. Droughts occur at multiple spatial scales and evolve over timescales that make them distinctive compared to other 'natural' hazards. Whilst the occurrence of droughts is driven significantly by meteorological and (surface and groundwater) hydrological conditions, impacts of water scarcity are profoundly influenced by human choices and trade-offs between competing claims for water. Those choices are, in turn, shaped by the societal and institutional contexts in which they are embedded (Sayers et al. 2014).Its complexity has led to multiple definitions of 'drought' reflecting the varying climatic characteristics from one region to other and the sector-specific impacts it has. On all measures drought impacts appear to be increasing in both developing and developed countries and will increasingly put a break on development and lead to irreversible environmental damage (UNEP, 2013). Future droughts will happen. Reducing the impacts will require a more strategic approach to drought planning (at a policy and more local level). Such plans will need to emphasize on the effectiveness of drought management strategies in reducing drought (Mitchell & Wilkinson, 2012).

Globally, China has been seen as a giant in setting out suitable climate for drought management strategies. According to Kellett and Peters (2013), the Chinese government has committed significant resources to address water resource management to avert and limit the frequency of droughts and their effects to its ever increasing population that is often associated with very significant social, economic and environmental consequences. In Africa's Ethiopia for example, the national government has been partnering with a number of NGOs, CBOs, FBOs and many more since the severe drought that was experienced in 1984. The partnerships have been said to be among the strategies that have been adopted to reduce the severity and effects of the drought and dearth in the country. However, the strategies have been found to be failing and performing poorly from time to time due to factors like: poor organizational/institutional structures, shortage of qualified leaders and experts, irrelevant programs and policies adoption, poor funding of the process, poor

understanding of the risks, poor political goodwill and poor climate management technology (WFP, 2013).

In Kenya, drought has been a major, dominant and frequent hazard affecting the country's population, more specifically in arid and semi-arid lands (ASALs) (GOK, 2012). Hazards such as drought and floods were experienced in the country in 2000, 2005, 2006, 2009 and 2011, but the drought hazard has a significant effect that needs to be controlled and mitigated. This needs well defined policies, rules, regulations, strategies and many more (UNDP, 2012). UNEP (2011) adds that drought is the prime recurrent natural disaster in Kenya that affects the 10 million people, mostly livestock dependent people in the Arid and Semi-arid Lands districts. This has called for a number of interventions/strategies across the frequently drought affected areas that include: water trucking, boreholes, other water activities, destocking slaughter, destocking commercial, animal health, animal feed and peace building. However, studies have indicated that, the success of these strategies has tied itself to a number of factors across the country that include: politics, financial resources, timing of responses, expertise information, technology used, and availability of qualified manpower have been issues all round(WFP, 2012). Climate proofed infrastructure is also emerging as an important drought mitigation strategy, however, one that has not received considerable research attention.

1.1.1 Climate-Proofed Infrastructure

Parry et al. (2007) define climate proofing as an understanding of current and future climate risks in order to develop new measures or adjustments to programs and projects so that these risks are minimized, in other words taking actions to protect investments against climate impacts. According to Klein *et al.,* (2007), climate proofing is the modification of existing and future projects so that they are resilient to impacts from climate change and/or do not contribute to increased vulnerability of the projects goals. Another definition, from the gray literature, states that climate proofing are activities added to an ongoing development initiative to ensure its success under a changing climate (McGray 2007). Therefore, climate proofing is the identification of risks to a development project as a consequence of climate variability and change, and ensuring that those risks are reduced to acceptable levels through long lasting and environmentally sound, economically viable, and

socially acceptable changes implemented at one or more of the following stages in the project cycle: planning, design, construction, operation, and decommissioning (Baltzar et al., 2009). Olhoff & Schaer (2010) notes that, drought management strategies are influenced by climate proofed infrastructure in various ways like: project risk screening and scoping; impact assessment ,vulnerability assessment; adaptation assessment; implementation arrangements; and monitoring and evaluation.

1.1.2 Drought Management Strategies by NDMA

According to WFP (2014), the history of Kenya's work on drought management goes back to 1985, with the design of a drought contingency planning system (strategy paths) in Turkana. In the early 1990s this system was extended to other arid and semi-arid districts like Taita with the support of the Netherlands government. However, the Kenyan government recognized the need to strengthen the sustainability and quality of drought management in Kenya by establishing the National Drought Management Authority (NDMA).the National Drought Management Authority (NDMA) is a public body established by the National Drought Management Authority (NDMA) Act, 2016. It previously operated under the State Corporations Act (Cap 446) of the Laws of Kenya by Legal Notice Number 171 of November 24, 2011. The Act gives the NDMA the mandate to exercise overall coordination over all matters relating to drought management including formulation of drought management strategies, polices, implementation of policies and programmes relating to drought management.The NDMA provides a platform for long-term planning and action, as well as a mechanism for solid coordination across Government and with all other stakeholders. The Authority has established offices in 23 ASAL counties considered vulnerable to drought where, TaitaTaveta County is top 7 in the list and the activities of the body being unified to the Ministry of Agriculture and Natural Resources Management of TaitaTaveta County.The NDMA was seen as a risk management system that could help mitigate the frequency of effects of the drought in Kenya (Republic of Kenya 2014).

1.2Statement of the Problem

According to Republic of Kenya (2012), KPDNA report for 2008 – 2011 drought is one of the biggest threats to achievement of Kenya Vision 2030. If left unchecked, it can cause substantial damage and losses to the health and wellbeing of people and to the stability and growth of the nation. Drought management strategies have been implemented to ending

drought emergencies, however financial resources unavailability, inadequate human capital capacity building, poor investment of climate proofed infrastructure and tribal politics have impacted negatively in achieving this goal. Various studies have been done in drought management (Wilhite& Buchanan-Smith, 2005; Okoth, 2012; Musimba, 2014). A report by UNDP (2012) showed that droughts in Kenya have affected the communities that live in the arid and semi-arid lands and the communities have been engaged in various projects that are aimed at reducing their effects by either government bodies, NGOs, CBOs and FBOs. The study continued to show that a number of strategies have been developed by the Kenyan government since 1990s to address the drought in the ASALs but this has from time to time been affected by factors like polices, corruption, lack of financial resources, poor expertise involvement, poor communication, poor M&E and lack of proper planning. However, climate proof infrastructure as a drought mitigation strategy has not received sufficient research attention and since climate is variable over different contexts especially with the present situation of climate change, it is important to investigate how the climate proof infrastructure concept is being used to mitigate drought in these contexts. One such case is Taita Taveta County which is one of the marginal counties in Kenya which is vulnerable to drought and its effects.

1.3 Objective of the Study

The objective of this study was to examine the influence of climate-proofed infrastructure on the implementation of Drought management strategies in TaitaTaveta County, Kenya by the NDMA.

2.0 LITERATURE REVIEW

2.1 Implementation Theory

The origins of the implementation theory can be traced back to the works of Pressman and Wildavsky (1973). The pioneers of implementation theory, Pressman and Wildavsky (1973) define implementation theory in terms of a relationship to policy as laid down in official documents. According to them, policy implementation may be viewed as a process of interaction between the setting of goals and actions geared to achieve them (Pressman &Wildavsky, 1984). O'Toole (2003) defines policy implementation as what develops

between the establishment of an apparent intention on the part of government to do something or stop doing something and the ultimate impact of world of actions. More concisely, policy implementation refers to the connection between the expression of governmental intention and actual result (O'Toole et al., 1995) which is a fitting description when viewed from the implementation of the drought management. The government can only see the efficacy of its policy statements through the implemented policies. It is through implementation reports that the effectiveness of the policy can be seen, in other words, implementation of the budget helps outline the scope of the policy. Policy implementation encompasses those actions by public and private individuals or groups that are directed towardsthe achievement of objectives set forth in policy decisions. These includes both one-time efforts to transform decisions into operational terms and continuing efforts to achieve the large and small changes mandated by policy decisions.

However, that said, competing choices between the social actors may lead to certain challenges in implementation. This coupled by scarcity of resources may lead to an implementation problem requiring the designing a mechanism (game form) such that the equilibrium outcomes satisfy a criterion of social optimality embodied in a social choice rule (Maskin & Sjostrom, 2002). Failures of implementation are, by definition, lapses of planning, specification and control (Elmore, 1978).Successful implementation, according to Matland, requires compliance with statutes' directives and goals; achievement of specific success indicators; and improvement in the political climate around a program (Hupe, 2002).In the same vein, Giacchino and Kakabadse (2003) assess the successful implementation of public policies on decisive factors. According to them, these are the decisions taken to locate political responsibility for initiative; presence of strong project management or team dynamics and level of commitment shown to policy initiatives. Besides this, the success of a policy depends critically on two broad factors: local capacity and will. Questions of motivation and commitment (or will) reflect the implementer's assessment of the value of a policy or the appropriateness of a strategy. Motivation or will is influenced by factors largely beyond the reach of policy environmental stability; competing centers of authority, contending priorities or pressures and other aspects of socio-political milieu can also profoundly influence an implementer's willingness. This emphasis on individual motivation

and internal institutional conditions implies that external policy features have limited influence on outcomes, particularly at lower level in the institution (Matland, 1995).

In the context of the present study, it is important to appreciate that Drought Management in Kenya is a policy imperative anchored on an Act of Parliament and has an attendant body the NDMA created by the NDMA Act 2016. The NDMA is nominally a decision body used to set up and allocate and manage resources in order to achieve policies being pursued in mitigating drought in the country. Therefore, drought management strategies can only be implemented according to the provisions of the NDMA. The Implementation theory was, therefore, instrumental in providing insights into the nature of Drought Management policy implementation in the Kenya, particularly through the adoption of climate proof infrastructure.

2.2 Climate-Proofed Infrastructure and Drought management strategies Implementation

United Nations Development Programme (2011) examined how to pave way for Climate-resilient infrastructure. The research reviewed conference findings. Climate proofed infrastructure was defined as the explicit consideration and internalization of the risks and opportunities that alternative climate change scenarios are likely to imply for the design, operation and maintenance of infrastructure. In other words, integrating climate change risks and opportunities into the design, operation, and management of infra structure. According to the findings of the study, Infrastructure plays an important role in the development of countries. In many developing countries, evolving infrastructure can be particularly climate-sensitive and therefore highly vulnerable to the destruction that occurs due to natural disasters. Because these events cut across socio-economic sectors and administrative jurisdictions, they can jeopardize development objectives in distant places. Public infrastructure tends to be multifunctional in nature and serves a range of diverse stakeholders spread over a wide geographic area. It directly or indirectly provides critical services to the area it covers. Interruptions in services can cause negative economic impacts over a large territory. The lack of reliable services impedes a country's ability to pursue development goals. For this reason, it is important to incorporate efforts to increase the climate resilience of infrastructure into development strategies, by taking into consideration

the risks of climate change, such as the UNDP Green, Low-Emission and Climate-Resilient Development (Green LECRD) strategy.

In a County Programme Paper (2012) by the Republic of Kenya titled "Programming Framework to End Drought Emergencies in the Horn of Africa", Climate-Proofed Infrastructure was found to influence drought strategy. According to the findings of this paper, the lack of adequate infrastructure in the ASALs under mines investment and reinforces the perceived separation of the region from the rest of the country. A more robust infrastructure in the arid lands will improve the food supply chain (packaging, transportation and storage), strengthen market access (retail and wholesale outlets, market information) and improve terms of trade. It will stimulate investment and economic growth and improve operational efficiency for both the public and private sectors. It will help reduce poverty and lower the cost of doing business. In parts of Ethiopia, public investment in roads and extension services increased consumption growth by up to 16% and reduced poverty by nearly 7%. Better infrastructure will stabilize the ASALs and enhance its integration with the rest of the country. Expanding infrastructure in dry land areas risks exposing pastoral societies and environments to a rapid process of change that can bring new challenges, such as the breakdown of customary support systems and environmental degradation. To avert such risks, communities will require assistance in adapting to, managing and controlling infrastructure changes through capacity building, empowerment and the provision of a central role in relevant decision-making processes, as well as clear rights over the proceeds from resources. Environmental and social impact assessments will be conducted on all infrastructure projects, which should also be part of participatory land-use planning systems.

2.3 Empirical Review

Muhua and Waweru (2017) studied the Influence of Drought Mitigation Strategies on Food Security. The study with special reference to Laikipia East Sub-County revealed that majority of households were aware of drought mitigation strategies which influenced household food security but these were poorly coordinated, late, insufficient and lacked sufficient funding. The study also found out that household participation was low in implementation. The study recommended more capacity building on drought mitigation strategies, timely

planning for drought to ensure coordinated response to drought especially in human and livestock relief projects. The study was however narrow in scope and focused only on drought management strategies focusing on the recipient rather than the implementers. The present study, however, focused on the implementer, NDMA, and examine the implementation of the drought management strategies using four constructs; financial resources, human capital development, political environment, and climate proofed infrastructure.

Ouma, Obando and Koech (2012) on the other hand examined post drought recovery strategies among the Turkana pastoralists in Northern Kenya. The study found climate variability and change as leading to recurrent droughts thus leading to water shortage and disruption of the vegetation cycle, leading to crisis facing these pastoralists resulting in catastrophic losses. The study, however, revealed that pastoralists have built traditional mechanism to cope with and recover from droughts. The study did not, however, demonstrate how climate proofed infrastructure was being used to mitigate drought. Further, the focus was on the pastoralists and not the program implementer, the NDMA. The present study, therefore, examined climate proofed infrastructure in detail and focused on the implementer as opposed to the recipient.

2.4 Research Gap

Despite several studies being conducted on drought management strategies, there are gaps that have not been filled. First, there are contextual gaps in that most studies were carried in international contexts where the factors affecting drought mitigation are not necessarily replicable to the Kenyan context. Olhoff and Schaer (2010), for instance, examined ways in which drought management strategies are influenced by climate proofed infrastructure. However, the study focused on ways in which drought management strategies in Nigeria, South Africa and Angola but did not include Kenya. Further, most studies have focused on drought management strategies implemented by Non-Governmental Organizations-both local and international and with little attention being given to public sector organizations such as the NDMA.

3.0 METHODOLOGY

3.1 Research Design

This study adopted a descriptive survey research design.This design was preferred for this study because of its ability to capture attitudes that would be difficult to measure using observational techniques.

3.2 Target Population

The target population for this study consisted of employees of National Drought Management Authority in TaitaTaveta County, some government line ministries, NGOs heads and community based organizations heads who deal with drought management totaling to 165 respondents.

3.3 Sampling Size and sampling Technique

The population was divided into four strata: the four Sub Counties of TaitaTaveta County to ensure representation in the entire county. A stratified sampling was used to determine the sample targeting National Drought Management Authority staff, government line ministries, NGOs heads and community based organizations heads. The sample size (n) was computed using Sudman formula as cited by Singh, and Masuku (2014).

$$n = \frac{\left(\frac{P[1-P]}{\frac{A^2}{Z^2} + \frac{P[1-P]}{N}} \right)}{R}$$

Where:

n = sample size required

N = the population

P = estimated variance in population, as a decimal: (0.5 for this study)

A = Precision desired, expressed as a decimal (0.05 for this study)

Z = Based on confidence level: 1.96 for 95% confidence,

R = Estimated Response rate, as a decimal 0.70

A sample size of 81 respondents resulted from the application of the formula.

3.4 Data Collection Procedures and Instruments

Primary data was collected using copies of researcher developed structured questionnaires. **The questionnaires** were administered to **respondents through drop and pick later method. The questionnaires were piloted in the neighboring** Kwale County Government which has similar characteristics to Taita Taveta County prior to being administered for the study. Respondents from the pilot group did not participate in the actual study.

3.5 Validity and Reliability of the Research Instruments

This research used content validity as a measure of the degree to which the data collected using the questionnaire represents the objectives of the study.The instrument was discussed with the researcher's supervisors and two other faculty members at the university.

This study adopted internal consistency method to estimate test reliability. Internal consistency was tested using the Cronbach's alpha. The results of the instrument reliability is as shown in Table 1.

Table 1: Reliability test

Variable	Cronbach's Alpha	No of Items
Climate proofed infrastructure	0.760	5
Implementation of Drought management strategies	0.796	4

The Cronbach's alpha coefficient for the two constructs was each higher than the recommended alpha of 0.70 or above and was, therefore, accepted for the study (George &Mallery, 2003).

3.6Data Analysis and Presentation

Analysis of data collected was conducted through descriptive and inferential statistical methods. Descriptive statistical analysis was carried out using frequencies and percentages while inferential data analysis was done using the Simple Linear Regression to determine the relationship between variables and allow for generalizations to the larger population. The data was presented using frequency distribution tables, charts and figures.

4.0 Results and Discussions of Findings

4.1INTRODUCTION

A total of 81 respondents sampled from National Drought Management Authority, government line ministries, NGOs heads and community based organizations heads involved in drought management in TaitaTaveta County were issued with questionnaires. However, only 64 respondents returned their questionnaires filled correctly translating to a 79.01% response rate. This response rate was considered adequate as recommended by Babbie (2002) and Mugenda and Mugenda (2003). The instrument response rate for the study is given in Table 2.

Table 2: Response Rate

Category	Frequency	Percentage
Response	64	79.01
Non response	17	20.99
Total	**81**	**100.0**

4.2 Descriptive Analysis

Descriptive analysis was used to describe the basic features of the data in the study giving a summary about the sample in a sensible and manageable form.

4.2.1 Climate proofed infrastructure

The results of the extent to which climate proofed infrastructure influence the implementation of Drought management strategies by the NDMA inTaitaTaveta County are given in Table 3.

Table 3: Respondents' perception on climate infra structure on strategy implementation

Climate Proofed infrastructure	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Project risk screening and scoping influences the implementation of drought management strategy implementation.	0(0%)	0(0%)	22(34.4%)	15(23.4%)	27(42.2%)
Impact assessment as outlined in climate proofing has an influence in the implementation of the drought management strategy.	0(0%)	0(0%)	11(17.2%)	37(57.8%)	16(25%)
Vulnerability assessment as outlined in climate proofing has an influence in the implementation of the drought management strategy.	0(0%)	11(17.2%)	11(17.2%)	15(23.4%)	27(42.2%)
Adaptation assessment as outlined in climate proofing has an influence in the implementation of the drought management strategy	0(0%)	0(0%)	21(32.8%)	28(43.8%)	15(23.4%)

The findings in Table 3 indicate that majority of the respondents (65.6%) were of the view that project risk screening and scoping influence the implementation of drought management strategies. Most respondents also agreed that impact assessment (82.8%), vulnerability assessments (65.6%) and adaptation assessment (67.2%) as outlined in climate proofing influence in the implementation of the drought management strategy. This indicates that organizations should identify risks to a development project as a consequence of climate variability and change, and ensure that those risks are reduced to acceptable

levels through long lasting and environmentally sound, economically viable, and socially acceptable changes implemented (Baltzar et al., 2009).

4.2.2 Implementation of drought management strategies

The findings on the implementation status of Drought management strategies by the NDMA in TaitaTaveta County, Kenya are given in Table 4.

Table 4: Respondents' perception on drought management strategies

Drought management strategy	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
For drought management strategies to be effectively implemented there needs to be good financial resource mobilization	1(1.6%)	27(42.2%)	1(1.6%)	25(39.06%)	10(15.6%)
Successful implementation of drought management strategies in organizations requires competent human resources	7(10.9%)	11(17.2%)	6(9.4%)	31(48.4%)	9(14.1%)
Climate-proofed infrastructure is essential for drought management strategies	0(0%)	9(14.1%)	21(32.8%)	19(29.7%)	15(23.4%)
For various institutions to achieve effective drought management strategies implementation there must be a political goodwill from the local and national leaders.	0(0%)	0(0%)	16(25%)	37(57.8%)	11(17.2%)

The findings in Table 4.7 indicate that majority of the respondents (54.66%) agreed that effective implementation of drought management strategies required good financial resource mobilization. The results also indicate that most of the respondents felt that successful implementation of drought management strategies in organizations was dependent on competent human resources (62.5%). Most respondents were of the opinion that climate-proofed infrastructure was essential for drought management strategies in the area (53.1%). Further, majority of the respondents (75%) were of the view that for various

institutions to achieve effective drought management strategies implementation there must be a political goodwill from the local and national leaders. These findings suggest that for proper implementation of drought management strategies in the area, there was need for adequate financial resource mobilization; well spelt, sufficient and well streaming sources of finances. A robust human resource base together with climate proof infrastructure were also important for strategy implementation. In addition, drought management strategies in the area required political goodwill from the local and national leaders.

These findings agree with those of a study done by Food for Asset (2013) on the successful implementation of drought management strategies that established that factors like the availability financial resources and human resources availability; their knowledge and skills influence the implementation of such strategies. The findings also agree with the WFP (2012) that the success of these strategies was tied to a number of factors across the country, such as, politics, financial resources and availability of qualified manpower among other things.

4.3 Regression Analysis

Simple bivariate regression was performed to establish whether climate proof infrastructure significantly influenced strategy implementation by the NDMA in TaitaTaveta County, Kenya are given in Table 5.

Table 5: Regression results of climate proof infrastructure on strategy implementation

Dependent Variable: Strategy Implementation						
		B	Std. Error	Beta	T	Sig.
	(Constant)	18.085	0.893		20.257	0.000
Independent Variable:	Climate Proof Infrastructure	0.189	0.055	0.399	3.427	0.001
	R-square	0.159				
	Adjusted R Square	0.146				
	F	11.747				
	Df	1,62				
	Sig.	.001b				

The bivariate regression results in Table 5 indicates that climate proof infrastructure had a significant relationship with drought management strategy implementation by NDMA (β = 0.408, $p \leq 0.05$). A unit change in climate proof infrastructure would translate to a 0.189 change in standard deviations of the climate proof infrastructure in the area. The model could also explain 14.6% of the variations in drought management strategy implementation. The findings concur with Olh off and Schaer (2010) that, drought management strategies are influenced by climate proofed infra structure in various ways like: project risk screening and scoping; impact assessment, vulner ability assessment; adaptation assessment; implementation arrangements; and monitoring and evaluation.

5.0 Conclusions and Recommendations

5.1 CONCLUSIONS

The study established that climate proof infrastructure had a significant relationship with drought management strategy implementation by the NDMA. Particularly, project risk screening and scoping influenced the implementation of drought management strategies. Also, impact assessment, vulnerability assessments and adaptation assessment as outlined in climate proofing were viewed as influential factors in the implementation of the drought management strategy. The study, therefore, concludes that drought management strategies are significantly influenced by climate proofed infrastructure. These are the activities added to an ongoing development initiative to ensure its success under a changing climate thus calling for project risk screening and scoping;impact assessment,vulnerability assessment;adaptation assessment;implementation arrangements; andmonitoring and evaluation.

5.2 Recommendations

The NDMA in the area should install early warning systems and adopt risk management strategies to enable it identify risks to a development project as a consequence of climate variability and change, and ensure that those risks are reduced to acceptable levels through long lasting and environmentally sound, economically viable, and socially acceptable changes.

REFERENCES

Baltzan, M. A., Elkholi, O., &Wolkove, N. (2009). Evidence of interrelated side effects with reduced compliance in patients treated with nasal continuous positive airway pressure. *Sleep medicine*, *10*(2), 198-205.

County Programme Paper (2012). "*Programming Framework to End Drought Emergencies in the Horn of Africa*." Republic of Kenya.

FFA (2013). *Regional Overview of Food Insecurity Africa*. Retrieved from http://www.fao.org/3/a-i4635e.pdf

Klein, A. M., Vaissiere, B. E., Cane, J. H., Steffan-Dewenter, I., Cunningham, S. A., Kremen, C., &Tscharntke, T. (2007). Importance of pollinators in changing landscapes for world crops. *Proceedings of the Royal Society of London B: Biological Sciences*, *274*(1608), 303-313.

Maskin, E., &Sjöström, T. (2002). Implementation theory. *Handbook of social Choice and Welfare*, *1*, 237-288.

MC Gray, M. C., Converse, A. O., & Wyman, C. E. (2007). Solubilities of oligomer mixtures produced by the hydrolysis of xylans and corn stover in water at 180 C. *Industrial & Engineering Chemistry Research*, *46*(8), 2383-2391.

Mitchell, T. &Wilkinso, K. (2012). Options for including disaster resilience in post-2015 development goals.

Mugenda, O.M., and Mugenda, A.G. (2003). *Research Methods, Quantitative & Qualitative Approaches*. Act Press, Nairobi

Muhua, G. O., &Waweru, J. K. (2017). Influence of Drought Mitigation Strategies on Food Security: A Case of Laikipia East, Laikipia County, Kenya. *European Scientific Journal, ESJ*, *13*(18).

Musimba, S. (2014). Role Of Community Participation In Drought Risk Management In Kilifi County, Kenya. *A Project for the Award of Master of Arts Project Planning and Management of the University Of Nairobi*.

O'Toole, L.J.R. Jr. (2003), "Rational Choice and Policy Implementation", *American Review of Public Administration,* 25(1) 43-57

Olhoff, A., &Schaer, C. (2010). Screening tools and guidelines to support the mainstreaming of climate change adaptation into development assistance-a stocktaking report. *Screening tools and guidelines to support the mainstreaming of climate change adaptation into development assistance-a stocktaking report.*

Ouma, C., Obando, J., &Koech, M. (2012). Post Drought recovery strategies among the Turkana pastoralists in Northern Kenya. *Scholarly Journals of Biotechnology*, *1*(5), 90-100.

Parry, M., Parry, M. L., Canziani, O., Palutikof, J., Van der Linden, P., & Hanson, C. (Eds.). (2007). *Climate change 2007-impacts, adaptation and vulnerability: Working group II contribution to the fourth assessment report of the IPCC* (Vol. 4). Cambridge University Press.

Republic of Kenya (2014). NDMA. Committed to Ending Drought Emergencies. Retrieved from http://www.ndma.go.ke/

Republic of Kenya (*2012*). Post Disaster Needs Assessment, *2008-2011report* for the use of all stakeholders and the ASAL. ICC

Sayers, P., Galloway, G., Penning-Rowsell, E., Yuanyuan, L., Fuxin, S., Yiwei, C., ... & Guan, Y. (2014). Strategic flood management: ten 'golden rules' to guide a sound approach. *International Journal of River Basin Management*, *13*(2), 137-151.

Singh, A. S., &Masuku, M. B. (2014). Sampling techniques & determination of sample size in applied statistics research: An overview. *International Journal of Economics, Commerce and Management*, *2*(11), 1-22.

UNEP (2013). Reducing the scale and impact of climate change. Retrieved from https://wedocs.unep.org/bitstream/handle/20.500.11822/7729/-Reducing the scale and impact of climate change-2016Reducing the Scale and Impact of Climate Change.pdf.pdf?sequence=3&isAllowed=y

United Nations Development Programme (2011). Paving the Way for Climate-Resilient Infrastructure. Guidance for Practitioners and Planners

United Nations Development Programme (UNDP) (2012) Resource guide on gender and climate change. UNDP, New York

United Nations Environment Programme (2011) Greenhouse gas emissions gap widening as nations head to crucial climate talks in Doha. Retrieved from http://www.unep.org/newscentre/default.aspx?DocumentID=2698&ArticleID=9335.

Wilhite, D. A., & Buchanan-Smith, M. (2005). Drought as hazard: understanding the natural and social context. *Drought and water crises: Science, technology, and management issues*, 3-29.

World Food Program (2013) Livelihoods, early assessment and protection. Cited on a website for WFP at http://www.wfp.org/disaster-risk-reduction/leap. 12 May 2013

World Food Programme (2015). *WFP and Food Based Safety Nets: Concepts, Experiences and FutureProgrammingOpportunities*Available:http://www.wfp.org/eb/docs/2004/wfp039212~2.pdf [Accessed 2 April 2014].

World Food Programme (2016). *Full report of the evaluation of the WFP West Africa Coastal Region Protracted Relief and Recovery Operation*. Rome: World Food Programme. 59