ISSN: 0976-3031

Available Online at http://www.recentscientific.com

CODEN: IJRSFP (USA)

International Journal of Recent Scientific Research
Vol. 9, Issue, 7(F), pp. 28136-28141, July, 2018

International Journal of Recent Scientific Research

DOI: 10.24327/IJRSR

Research Article

RELIABILITY OF INDIGENOUS TRADITIONAL KNOWLEDGE AND CONVENTIONAL WEATHER FORECASTSIN THE FACE OF CLIMATE CHANGE AND VARIABILITY IN BARINGO COUNTY, KENYA

Muriithi, GM[1*]., Olago, DO[2]., Ouma, GO[2] and Oriaso, SO[2]

[1]Beef Research Institute-Lanet, Kenya Agricultural and Livestock Research Organization
[2] Institute for Climate Change and Adaptation, University of Nairobi, Kenya

DOI: http://dx.doi.org/10.24327/ijrsr.2018.0907.2401

ARTICLE INFO

Article History:
Received 4th April, 2018
Received in revised form 25th May, 2018
Accepted 18th June, 2018
Published online 28th July, 2018

Key Words:

Pastoralists, Weather Forecast, and Climate Change

ABSTRACT

The research study evaluated the reliability of Indigenous Traditional Knowledge (ITK) and conventional weather forecasts in the face of climate change and variability in Baringo County, Kenya. Systematic sampling technique was applied in drawing a sample size of 454 pastoralists and agro-pastoralists interviewed. Majority (68%) of the respondents have not been aware of blend/mixture of ITK and scientific forecasting techniques. Majority (78% ,77 %,74%, 61%,73%,73% and 71%) of the respondents perceived that conventional weather forecast approach is reliable on predicting short-rains season, long-rain season, rainfall intensity, landslide, thunder storm, expected rainfall onset and cessation, and El-Nino respectively. The majority (71%, 69%, 75% and 64%) of the pastoralists and agro-pastoralists professed that ITK weather forecast approach is reliable on predicting floods, seasonal rain distribution, temperatures and La-Nina respectively. None of the two weather forecasts approaches could exhaustively forecast the climate/weather events alone. The integration of the two approaches is ultimate for effective reliability.

INTRODUCTION

The African Sahel region is characterized by severe and frequent droughts with records dating back to centuries. The local population, through Indigenous Traditional Knowledge (ITK) systems, have developed and implemented extensive mitigation and adaptation strategies which have enabled them to reduce their vulnerability to past climate variability and change (Nyongo *et al* 2007). In support of Luse no *et al* (2002) arguments, Odero (2011) found that indigenous seasonal weather predictions are the resource that is most readily available to small holder farmers, pastoralists, fishing communities and forest dwellers in Kenya to address climate change challenges. The indigenous knowledge seasonal weather forecasts encompasses prediction of rainfall using local environmental indicators and astronomical factors. One important step in reducing the vulnerability of a climatic hazard is the development of a nearly warning system for the prediction or forecast of the event. There is a wealth of local traditional knowledge based on predicting weather and climate (Ajani *etal* 2013). Chang'a1 *et al*(2010) reported that the local weather and climate are assessed and predicted by locally observed variables. It is enhanced by the experiences of the locals in using combinations of plant, animals and insects meteorological and astronomical indicators. As cited by Kijazi *etal* (2012) in the conservation of the environment and address of natural disasters, for a long time in history, local communities indifferent parts of the world have continued to rely on indigenous traditional knowledge. The communities, particularly those in droughts and floods prone areas have generated a vast body of indigenous knowledge on disaster prevention and mitigation through early warning and preparedness (Rangoli *et al* 2002; Anandaraja *etal* 2008; Svotwa *et al* 2007). Climate information has increasingly become important and available in the last decade and Regional Climate Outlook Forums have enhanced dialogue on seasonal forecasts among producers of information, researchers and different categories of decision-makers (Goddard *et al* 2010). Jiri (2016) pointed out that scientific forecasts have to some extent failed to make the intended impact on small holder farmers due to the inaccessibility and inequitable distribution of this information to small holder farmers as the primary users of the information. Further, Jiri (2016) argued that in the context of the dominance of scientific forms of forecasting, the

Corresponding author:* **Muriithi, GM
Beef Research Institute-Lanet, Kenya Agricultural and Livestock Research Organization

architect of this approach expressed unfairness to indigenous indicators, which they tend to regard them to be backward. Scientific forecasting information is not embraced by the small holder farmers due to a number of reasons. Lack of a sense of ownership by farmers and decision makers alike has contributed to the limited uptake of the disseminated meteorological information (Glantz 2003,2005; Goddard *etal* 2010). For this and other reasons, climate scientists are increasingly under pressure to transcend their disciplinary confines and engage in a process of joint, continued and participatory learning with users of the information and encourage effective Outreach programmes for the information to realize its full potential. It corroborates Koigi (2016)report, that as changes in weather continue to ravage farms and take a toll on food production across East Africa, scientists and meteorologists are turning to traditional rain makers and weather forecasters to bolster the accuracy of weather predictions.

METHODOLOGY

Study area where the household survey was conducted

The study was conducted in Kenya and focusing on Baringo South and Mogotio Sub-counties in Baringo County which is an Arid and Semi-Arid Lands (GOK 2015). The residents in the two Sub-counties practice pastoralists and agro-pastoralism. Figure 1 shows map of Baringo County and the specific study area showing the distribution of the households that were interviewed in the household survey.

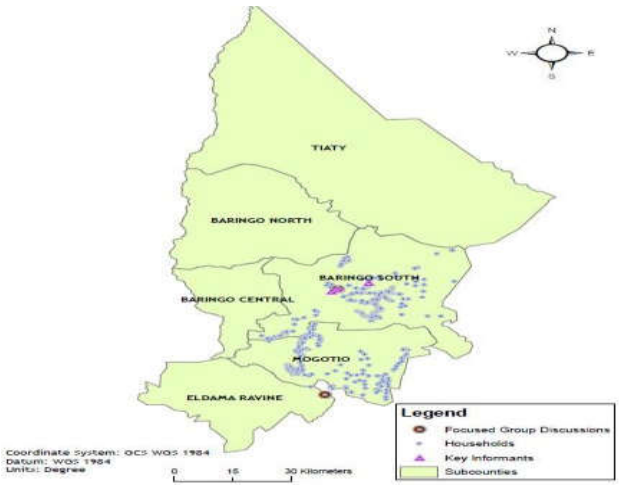

Figure1 Map of Baringo County and the study area location showing the distribution of the households interviewed in the house hold survey, Mogotio and Baringo South (Marigat).

During the actual household survey, systematic sampling technique was applied in selecting households. This involved interviewing every fifth household along a defined route. Household survey was undertaken. It involved the researcher developing closed and open-ended structured questionnaires/interview schedules, Focus Group Discussion (FGD) and Key Informants (KI) interview guides as the tools for collecting the primary data. For the researcher to familiarize with the topography and the terrains of the study area, are connaissance was undertaken prior to pretesting of the data collecting tools and actual data collection. The above-mentioned activities were performed to ensure quality data collection. The study population was the community in Baringo South and Mogotio Sub-counties while the target population was the livestock farmers' household (see Figure 1). The unit of analysis was the household. In order to get a good representative of the targeted population the below procedure and formula was employed;

The simple rand om sampling technique was used to draw a sample size of 454 respondents for the survey as follows:

Fishers' formula as described by Yamane (1967) and Mugenda and Mugenda (2003) is expressed as

$$n = \frac{N}{1 + Ne^2}$$

Equation 1

Where **n** is the sample size, **N** the targeted population and ***e*** the desired level of precision or confidence level. The population of Baringo South Sub-County and Mogotio Sub-County, which is 142,570 IEBC (2009) was considered as the study population in the computation of the sample size and the level of precision will be taken to be 5% level of significance. The calculations for the sample size are displayed as follows;

$$n = \frac{142570}{1 + 142570(0.05)^2} = 398.88 \approx 399$$

As recommended by Eng (2003) it is important to increase the size of the sample to cater for the non-response of the respondent. Suppose 80% was the response rate, to ensure that the gathered data from an acceptable number of respondents it was necessary to increase the sample size from the formula by (20/80)% that is 25%. Thus, the study used a sample size of approximately 454 respondents (Kasiulevicius *et al* 2006). The study actual response rate attained was 96.4% (see Table 6.2). The non-probability sampling design was used in drawing ten key informants from government officials (livestock extension officers, ASDSP, Livestock cooperative marketing officers, NGOs like World Vision and Kerio Valley Authority). Table 1 below shows the actual study sample size broken down as follows;

Table 1 Ward Study Sample Size, Interview Response and Rate

Sub-County	Ward	Number of Respondents
Marigat(BaringoSouth)	Mochongoi	59
	Mkutani	59
	Marigat	68
	Ilchamus	63
Mogotio	Emining	72
	Mogotio	72
	Kisanana	61
Total Sample Size		**454**
Number responded		437
Response Rate		96.3%

The data was found to be sufficient for analysis since it was above 80% of total expectation according to Babbie (1995) who considers 70% response rate and above to be very good. The Participatory Rural Appraisal (PRA) methods namely key informant interviews and Focus Group Discussions (FGDs) were also used in data collection. On 30th August 2017 at FGD was conducted at Livestock Improvement Centre

located on S00.03477^0, E035.954900 Elevation:1612 Min Mogotio Sub-county. The group comprised often participants where two came from each category; pastoralists, agro-pastoralists,–traditional rainmakers, livestock traders and livestock extension officers. The same type of composition of the participants applied to the other FGD that took place on 25th August 2017 at the Ministry of Livestock and Fisheries offices in Baringo South Sub county located on N00.47137^0, E035.98542^{0}Elevation:1027. A total of two Focus group discussions were conducted; one FGD per Sub-County. A Focus Group Discussion guide was used to moderate the discussion. This portion of the research nurtures the aspect of transdisciplinarity. Each of the above mentioned FGD involved up to ten people focusing on perceptions on climate change and various techniques used within the community in weather forecasting were explored. According to Saunders *et al* (2007) a typical focus group discussion involves four to twelve participants depending on interviewer skill and subject matter.

RESULTS

Table 2 below shows the different options of weather forecast approaches the pastoralists and agro-pastoralists use in making livestock production and marketing decisions in Baringo County.

Table 2 Climate/Weather Forecasting Techniques used by the Households

Forecasting Techniques	Frequency	Percent
Indigenous (ITK)	46	11
Conventional (Scientific)	43	10
Both (ITK and Scientific)	273	87
None	56	13

The study findings in Table2 demonstrates that majority (87%) of the respondents had been using both ITK and conventional weather forecast information in making decisions on livestock production and marketing activities in the study area.

Table 3 below presents results on awareness of the existence of blend/mixture of Indigenous Traditional Knowledge and conventional weather forecasting techniques in the study area.

Table 3 Blend/Mixture of ITK and Conventional weather forecasting Techniques

Awareness status	Frequency	Percent
Aware	127	32
Not Aware	271	68

The findings in Table 3 above demonstrated that majority (68 %) of the respondents have not been aware of blend/mixture of ITK and scientific forecasting techniques. Table 4 below shows reliability of Indigenous Traditional Knowledge weather forecast approach in predicting weather in Baringo County. The respondents were required to answer a set of questions whose response was categorized using a5 Likertscale; low, fair, good, very good and excellent. The categories, good, very good and excellent were considered to imply that the forecast was reliable while low and fair implied not reliable.

Table 4 Reliability of Indigenous weather forecast approach in Predicting

	Percent				
	Low	Fair	Good	VeryGood	Excellent
Short-rains season	8.6	18.2	16.3	29.8	27.1
Long-rains season	8.8	24.1	11.0	36.4	19.7
Dry season	8.2	33.3	17.8	24.2	16.4
Rainfall intensity	13.8	15.1	11.5	33.5	26.1
Floods	16.8	12.2	14.9	35.9	20.2
Drought	11	40.4	16.2	19.9	12.5
Landslide	17.8	26	17.8	28.8	9.6
Thunderstorms	16.9	18.1	20.9	32.2	11.9
Seasonal rain distribution	12.6	18.2	19.0	34.0	16.2
Expected rainfall on set and cessation	15.6	31.9	27.5	16.3	8.8
Temperatures	9.1	15.5	15.8	40.4	19.2
El-Niño	13.4	28.7	14.8	21.5	21.5
La-Nina	13.5	23	21.1	30.5	11.9

In the Table 4 above the study revealed that ITK weather forecast approach is reliable means of predicting the climate events. According to 73.2% and 67.1% of the respondents, the ITK weather forecast approach is reliable in predicting both the short-rains and long-rains seasons respectively. The weather forecast approach is considered to be reliable predictors of the rainfall intensity by 71.1 % of the respondents and seasonal rainfall distribution as cited by 69.2% as well as the temperatures as pointed out by 75.4%. However, majority of the respondents (52.6%) stated that ITK weather forecast approach is not reliable in predicting the expected rainfall on set and cessation, predicting dry season according to 58.4%. The study sought to establish the reliability of ITK indicators in predicting extreme climatic conditions. According to71.0% of the respondents, the ITK weather forecast approach is reliable predictors of floods, thunderstorms according to 65.0%, El-Nino as cited by 57.8%, la- Nina according to 63.5% and landslides as pointed out by 56.2%. However, majority 51.1% of the respondents stated that ITK indicators cannot be relied upon in predicting drought.

Pastoralists' opinions on reliability of conventional weather forecast

Table 5 below shows reliability of conventional weather forecast approach in predicting weather in Baringo County. A Likert scale of 5 scores is used where to compute for the reliability, the scores of good, very good and excellent are summed up for each climate/weather event.

Table 5 Reliability of Conventional weather forecast approach in Predicting Climate/ Weather

	Percent				
Climate Events	Low	Fair	Good	VeryGood	Excellent
Short-rains season	8.5	13.5	37.9	35.9	4.2
Long-rains season	5.6	17.2	25.7	32.1	19.4
Rainfall intensity	11.2	14.5	31	26	17.4
Floods	16.9	17.7	26.8	31.5	7.2
Drought	11.6	26.1	27.8	23	11.4
Landslide	13.7	24.9	33.7	22.9	4.7
Thunderstorms	10.2	16.5	35.7	28.9	8.7
Seasonal rain distribution	11.9	21.3	28.6	24.6	13.7
Expected rainfall on setand cessation	13.4	13.4	26.4	30.7	16.1
Temperatures	10.4	22.9	28	26.8	11.8
El-Niño	10.6	18.7	27.7	34.9	8.1
La-Nina	24.4	38.5	22	12.9	2.2

As indicated in Table 5, majority of the respondents pointed out that conventional weather forecast approach is reliable

inpredicting long-rains seasons (77.2%), short-rains seasons (78.0%), expected rainfall on set and cessation (73.2%), rainfall intensity (74.4%), seasonal rain distribution (66.9%) as well as temperatures (66.6%). It can also be seen that conventional weather forecast approach is also reliable predictors of extreme climatic conditions from the study. According to majority of the respondents, the weather forecast approach is reliable in predicting El-Niño (70.7%), floods (65.5%) and thunder storms (73.3%). However, the study established from majority of the respondents that their predictions is not reliable for some climatic conditions namely la-Nina (62.9%), landslide (38.6%) and drought (37.7%).

Pastoralists' opinions on reliability of both conventional and ITK weather forecast

Table 6 below shows the t-test results on reliability of scientific and Indigenous Traditional Knowledge weather forecast approach in predicting climatic/weather events (paired t-test) in Baringo County.

Table 6 Paired t-test Results on Reliability of Scientific and Indigenous Traditional Knowledge weather forecast approach in Predicting Climate/Weather

Climate Events	N	t	df	p-value
Short-rains season	335	4.363	306	**0.000**
Long-rains season	335	-1.328	348	0.185
Rainfall intensity	345	-0.325	213	0.746
Floods	345	4.719	211	**0.000**
Drought	342	-2.547	128	0.012
Landslide	342	1.803	140	0.074
Thunderstorms	345	-0.653	155	0.514
Seasonal rain distribution	345	0.097	241	0.922
Expected rainfall onset and	347			
		-4.002	159	**0.000**
Temperatures	347	1.269	263	0.205
El-Niño	346	-3.663	145	**0.000**
La-Nina	346	8.873	361	**0.000**

The study findings revealed that, Short rain season, $t(335)=4.363$, $p=0.000<0.05$, Floods, $t(345)=4.719$, $p=0.000<0.05$, Drought $t(345)=-2.547$, $p=0.000<0.05$, Expected rainfall onset and cessation $t(347) = -4.002$ $p=0.000< 0.05$, El-ninot$(346) =-3.663$, $p=0.000< 0.05$ and La- Nin at$(335) =8.873$, $p=0.000<0.05$

Most reliable climate/weather forecast in Baringo County

Table 7 shows the reliability of the climate /weather forecast approaches reported by the KIs in Baringo County.

Table 7 Reliable Climate/Weather Forecast in the Study Area by Government and its Agencies

Type of climate/weather Forecast	Frequency	Percent
ITK	2	22
Convectional	3	33
Blend/Mixture of ITK and Convectional	4	45
Total	**9**	**100**

However, the table 7 above generated from the Key Informant interviews, shows that the majority (45%) of the Government and its Agencies staff interviewed reported that blend/mixture of traditional and scientific forecast is the most reliable weather forecasts in the study area. This further supported by the ASDSP (2015) in the recent past the ASAL communities in the Baringo County have be ensuing climate information from both the Indigenous Traditional Knowledge and conventional weather forecasters

Table 8 below shows the reason why the ITK weather forecast in Baringo County.

Table 8 Why ITK Climate/Weather Forecast is Popular in the Study Area

Reasons	Frequency	Percent
1.Understandable i.e. easily interpreted by the local communities	4	29
2. Accessible to the communities	5	36
3. Local language used to explain the forecast	2	14
4. Practiced by diversified communities	3	21
Total	**14**	**100**

Based on the study findings in Table 8 above, majority (29%) KIs interviewed reported that the ITK is understandable and easily interpreted by the local communities hence making it popular to the majority of the pastoralists in the study area.

DISCUSSION

Table 2 revealed that majority of the pastoralists and agro-pastoralists were using both ITK and conventional weather forecast information in making decisions on livestock production and marketing activities in Baringo County. However, the performance of the ITK versus (conventional) scientific climate or weather forecasts is a very challenging scenario based on the fact that the latter use scientific instrument stop redict the weather while the former uses indicators such a strees, stars, animal intestines, winds and others.

The finding concurs with information provided by Key Informants (KI) during the survey, from Agricultural Sector Development Support Programme (ASDSP) and County Meteorological Department incorporate the communities known to be experts in ITK in weather forecasting in the County such as; the Jamesi, Tugens and Pokot, farmers, other sectors in the study area and the entire County in the seasonal weather forecast forums referred to as Participatory Scenario Planning (PSP). This is a sectoral participatory forum where they come up with probabilistic forecasts and agro-meteorological advisories. It normally occurs in October every year. The above-mentioned forum usually comes up with Seasonal Rainfall Advisories (SRA) for Baringo Sub-Counties (ASDSP2015). The aim of the PSP is promoting the integration of ITK and conventional weather forecasting in climate risk management. The role of ASDSP together with CARE International in Kenya (CIK), in the PSP forums is the funding and enhances the dissemination of the SRA in collaboration with the relevant ministries in the study area and the entire County.

It has enhanced sense of ownership of the forecast by farmers/pastoralists and decision makers have contributed to the overwhelming uptake of the disseminated hybrid/integrated meteorological information. The findings corroborate the Glatnz, 2003, 2005; and Goddard *et al* (2010) arguments, those climate scientists are increasingly under pressure to transcend their disciplinary confines and engage in a process of joint,

continued and participatory learning with users of the information and encourage effective outreach programmes for the information to realise its full potential. Table3 shows that majority pastoralists and agro-pastoralists have not been aware of blend/mixture of Indigenous Traditional Knowledge and scientific forecasting techniques. However, this contradicts Table2. Although majority reported to have been using both, the awareness of the existence of blend/mixture technique requires to be created. It is most likely that, this is a new initiative and the finding agrees with Netshiukhwi *et al* (2013) that farmers relied almost fully on their experience and traditional knowledge for farming decision making. This finding is further supported by the stakeholders' engagement forum where they recommended up scaling of the integrated seasonal climate forecast in the study area. Also, an FGD discussant said that, "we pastoralist in this area we rely upon ITK weather forecast where animal intestines can predict the weather with the interpretation of our "rainmakers". On the same notion, a KI reported that the farmers in the study area tend to believe on ITK more than conventional.

Table 4 revealed that ITK weather forecast approach is reliable means of predicting the climate event in Baringo County. According to the findings of this study the ITK weather forecast approach is reliable in predicting both the short-rains and long-rains seasons respectively. Also, the approach is considered to be reliable predictors of the rainfall intensity, seasonal rainfall distribution and the temperatures. The finding was boosted up by an FGD discussant who argued that, although the pastoralists have trust in the ITK weather prediction, it is not all climate event comes true as they predict, especially so in this era of climate change and variability. This finding corroborates Madzwamuse (2010) that local communities must build their resilience by adopting appropriate technologies while making most of traditional knowledge and diversifying their livelihoods to cope with current.

Table 5 revealed that majority of the pastoralists and agro-pastoralist interviewed in the study pointed out that conventional weather forecast approach is reliable in predicting long-rains seasons, short-rains seasons, expected rainfall on set and cessation, rainfall intensity, seasonal rain distribution as well as temperatures.

It can also be seen that conventional weather forecast approach is also reliable predictors of extreme climatic conditions from the study. However, the study established from majority of the respondents that their predictions is not reliable for some climatic conditions namely la-Nina, landslide and drought. The results presented in Table 6implies that the Indigenous Traditional Knowledge and conventional weather forecasts have statistically significant difference in the effectiveness in predicting short-rains seasons, floods, drought, expected rainfall on set and cessation, El-Niño and La- Nina at 5% levels of significance. For the long-rains seasons, rainfall intensity, landslide, thunder storms, seasonal rain distribution and temperatures the results showp >0.05. This implies that the Indigenous Traditional Knowledge forecasts and scientific forecasts do not have significant difference in the effectiveness in predicting the above-mentioned climatic events at 5% levels of significance.

Table 7 generated from the Key Informant interviews, through content analysis confirms the results in Table 5, that the majority of the Government and its Agencies staff interviewed reported that blend/mixture of traditional and scientific forecast are the most reliable weather forecasts in the study area. This was further supported by the ASDSP (2015) in the recent past the ASAL communities in the Baringo County have been using climate information from both the Indigenous Traditional Knowledge and conventional weather forecasters. Table 8 demonstrated that majority of the pastoralists and agro-pastoralist interviewed in this study reported that, ITK weather forecast as the most popular among the local communities in Baringo County because it is easily interpreted. The finding agrees with Luseno *et al* (2002) arguments that pastoralists worldwide rely heavily on Indigenous Traditional Knowledge seasonal weather prediction methods. However, the study further through content analysis of the Key informant interviews found the same reasons why Indigenous Traditional Knowledge is popular than convectional seasonal climate/weather forecast with the communities in the study area where the majority had an easy access to Indigenous Traditional Knowledge seasonal climate/weather forecast.

CONCLUSION

The results showed that majority of the communities in the study area had been using both ITK and conventional (scientific) weather forecast information in making decisions on livestock production and marketing. This has been sustained by Agricultural Sector Development Support Programme (ASDSP) who had been working together with Meteorological Development in organizing seasonal weather forecast forums referred Participatory Scenario Planning (PSP). In the forum they bring on board communities known to be good in ITK weather forecasting such as Jamesi, Tugens and Pokot, farmers and other stakeholders. However, ITK weather forecast has been very efficient relative to conventional in the study area. The major reason behind its efficiency is that majority is able to understand and easily interpreted by the local communities.

Area for Further Studies

Further research should be conducted on the assessment of the adoption rates of adaptation strategies to climate change and variability by the communities living in the Arid and semi-arid lands.

Acknowledgements

The authors wish to acknowledge the National Commission for Science, Technology and Innovation (NACOSTI) for providing the funds to undertake this study. Further, the authors appreciate the pastoralists and agro-pastoralists who accepted to be interviewed in the household survey and livestock traders, extension agents, abattoirs owners and managers who participated in FGDs and the key informants' interviews.

References

AjaniEN, Mgbenka RN and OkekeMN, (2013). Use of Indigenous Knowledge as a Strategy for Climate Change Adaptation among Farmers in Sub-Saharan Africa: Implications for Policy. *Asian Journal of Agricultural Extension, Economics & Sociology*,2(1): 23-40; ArticleNo. AJAEES.2013.003.

AnandarajaN, Rathakrishnan T, RamasubramanianM, SaravanPand Suganthi N S, (2008**).** Indigenous Weather and Forecast Practices of Coimbatore District Farmers of Tamil Nadu. *Indigenous Journal of Traditional Knowledge*, 7(4): 630– 633.

ASDSP (Agriculture Sector Development Support Programme), Seasonal Rainfall Advisories for Baringo Sub-Counties-March-April-May (MAM) 2015 in Kenya,2015.

Chang 'a1 LB, Yanda PZ and Ngana J, (2010). Indigenous Knowledge in Seasonal Rainfall Prediction in Tanzania: A Case of the South-Western Highland of Tanzania.

Epidemiological Studies. Gerontologija7(4):225-231pp.

Eng J, Sample Size Estimation: How many Individuals Should be Studied? Johns Hopkins University, USA,2003.

Glantz MH, Climate Affairs: A Primer.Washington:IslandPress,2003

Glantz MH, (2005). Usable Science 9:ElNiño Early Warning for Sustainable Development in Pacific Rim Countries and Islands. Report of Workshop Held September13-16,2004 In the Galapagos Islands, Ecuador. Boulder,ISSE/NCAR, 2005.

GoddardL, AitchelloucheY, BaethgenW, Dettinger M,Graham R, Hayman P, Conrad E , (2010**).** Providing Seasonal-To-Inter-AnnualClimateInformation for Risk Management and Decision-Making. Procedia Environmental Sciences,*1*, 81-101. http://dx.doi.org/10.1016/j.proenv.2010.09.007 Accessed 4 May 2017.

GOK (Government of Kenya), Ministry of Devolution and Planning: National Policy for the Sustainable Development of Northern Kenya And Other Arid Lands. Government of Kenya Press. Retrieved March 5, 2017 From https://www.google.com/search,2015.

IEBC (Independent Electoral Boundaries Commission), Documentary of Independent Electoral and Boundaries Commission. Nairobi, Kenya,2009.

JiriO, ParamuL, Mafongoya, Chipo, Mubaya1 and MafongoyaO, (2016). Seasonal Climate Prediction and Adaptation Using Indigenous Knowledge Systems in Agriculture Systems in Southern Africa: *Journal of Agricultural Science;* Vol. 8, No. 5;2016. Review.

KasiuleviciusV, Sapoka Vand Filipaviciute R, Sample Size Calculations in Epidemiological Studies. Gerontologija 7(4):225-231pp, (2006).

Kijazi AL, Chang'a1 LB, LiwengaET, Kanemba A and Nindi SJ, (2012). The Use of Indigenous Knowledge in Weather and Climate Prediction in Mahenge And Ismani Wards, Tanzania.

Koig B, (2016). Learning from The Rainmakers: East African Scientists Court Traditional Knowledge for Accurate Weather Predictions. *Earthisland journal*.http://www.earthisland.org/journal/index.php/elist/eListRead/ Learning_from_the_Rainmakers. Accessed on 2 April 2017.

Luseno WK, John G, McpeakJG, Barrett CB, LittlePD and GebruG, Assessing the Value of Seasonal Weather Predictions Information for Pastoralists: Evidence from Southern Ethiopia and Northern Kenya. Cornell University, USA, 2002.

Madzwamuse M, Climate governance in Africa: Adaptation Strategies and Institutions. United Press, Cape Town,2010.

Mugenda OM and Mugenda AG, Research Methods.Actspress, Nairobi, Kenya, 150pp, (2003).

Netshiukhwi GZ, Stigter K and Walke S, (2013). The Use of Traditional Weather/Climate Knowledge by Farmers in The South-Western Free State of South Africa: Agro Meteorological Learning by Scientists. ISSN 2073-4433.www.mdpi.com/journal/atmosphere. Accessed 28 January 2017.

Nyong A, Desina A and ElashaBO, The Value of Indigenous Knowledge in Climate Change Mitigation and Adaptation Strategies in the African Sahel. International Development Research Center, Nairobi, Kenya, 2007.

Odero K**, (**2011). The Role of Indigenous Knowledge in Responding to Climate Change: Local- Global Perspective. Final Proc. Conf. Climate Change, Africa Adapt, Pp.14-18.

Roangoli C, Ingram K and KirshenP, (2002). Reading the Rains: Local Knowledge and Rainfall Forecasting in Burkina Faso. Society and Natural Resources. Vol. 15, 409-427.Row,57pp.

Saunders M, Lewis P and Thornhill A**,** Research Methods for Business Students. 4th Edition, Financial Times Prentice Hall, Edinburgh Gate, Harlow:(2007)

Svotwa, E J, Manyanhaire,I O and Makanyire(2007**).** Integrating Traditional Knowledge Systems with Agriculture and Disaster Management: A Case for Chitora Communal Lands. *Journal of Sustainable Development in Africa.*Vol 9, No. 3, 50.

Yamane T, Statistics: An introductory analysis. 2nd Ed. NewYork, Harper and Row, 57pp, (1967)

How to cite this article:

Muriithi, GM *et al.* 2018, Reliability of Indigenous Traditional Knowledge and Conventional Weather Forecastsin the Face of Climate Change and Variability in Baringo County, Kenya. *Int J Recent Sci Res.* 9(7), pp. 28136-28141.
DOI: http://dx.doi.org/10.24327/ijrsr.2018.0907.2401

****