Climate Change and the Tea Sector in Kenya: Impact Assessment and Policy Action

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SOCIO-ECONOMIC IMPACT OF CLIMATE CHANGE ON SMALLHOLDER TEA FARMING IN KENYA: A BASELINE SURVEY

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Research carried out under an Agreement between the FAO Trade and Markets Division and the Tea Research Foundation of Kenya

Introduction

- The importance of tea in Kenya and more so in rural household economy cannot be over emphasized. Tea in Kenya is grown under two subsectors(Estate and the Smallholder). Smallholder farmers in the tea growing areas of Kenya depend greatly on tea to support their household income and livelihood. The production however is beset with a myriad of constraints of which climate change is one of the most outstanding

Objectives of the study

To asses on the socio-economic impacts of climate change among the smallholder tea farmers in Kenya, a study was initiated by FAO in collaboration with TRFK with the objective of:

- Assessing farmers economic vulnerability to climate change
- Measuring impact of climate change on farm enterprise composition
- Identifying best options in terms of coping strategies/mechanisms

METHODOLOGY

- The baseline data was obtained through a household survey conducted among the smallholder tea farmers
- KTDA managed factories are grouped into 7 regions distributed based on geographical location and one factory was selected per region.
- 14 smallholder KTDA managed tea factory catchments were purposefully selected so as to ensure regional representation and the farmers selected from across the catchment for a fair sample

KTDA Factories selected

- East of Rift:

  Makomboki, Njunu,Ragati,Gathuthi,Kimunye, Rukuriri, Githogo and Kiegoi
- West of Rift:

  Kapset, Momul, Tombe, Eberege, Chebut and Kapsara.
- 50 farmers were randomly selected using a transcend walk across the catchment. The sample size was 700 farmers.

Areas of focus

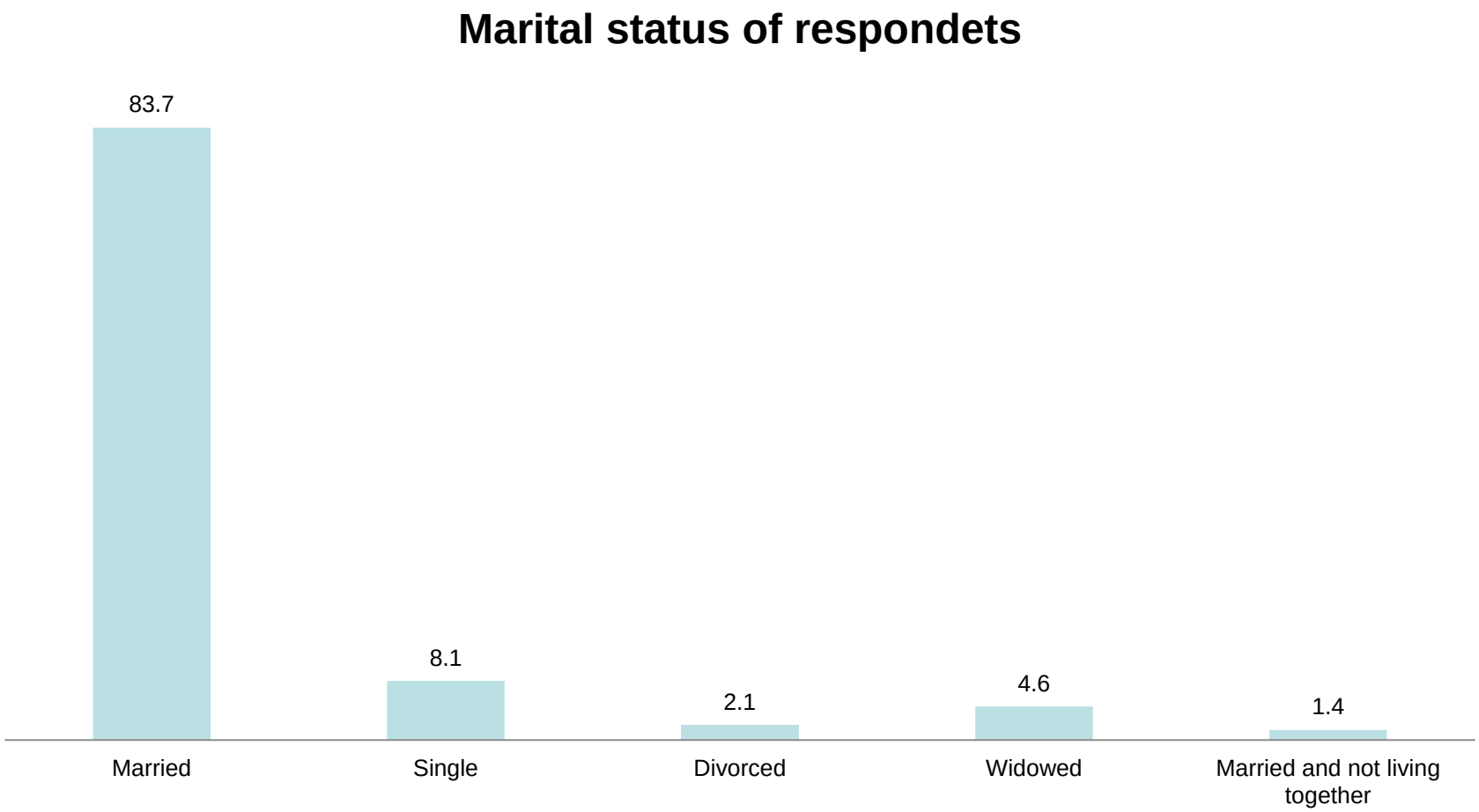
The main questions asked included:

- Household identification
- Individual records including age, gender, occupation, educational achievement, and relation to the household head
- Key household agricultural enterprises
- Key household livestock activities
- Household head/respondent perception of climate change, its impacts and mitigation measures
- Household incomes, sources and expenditure

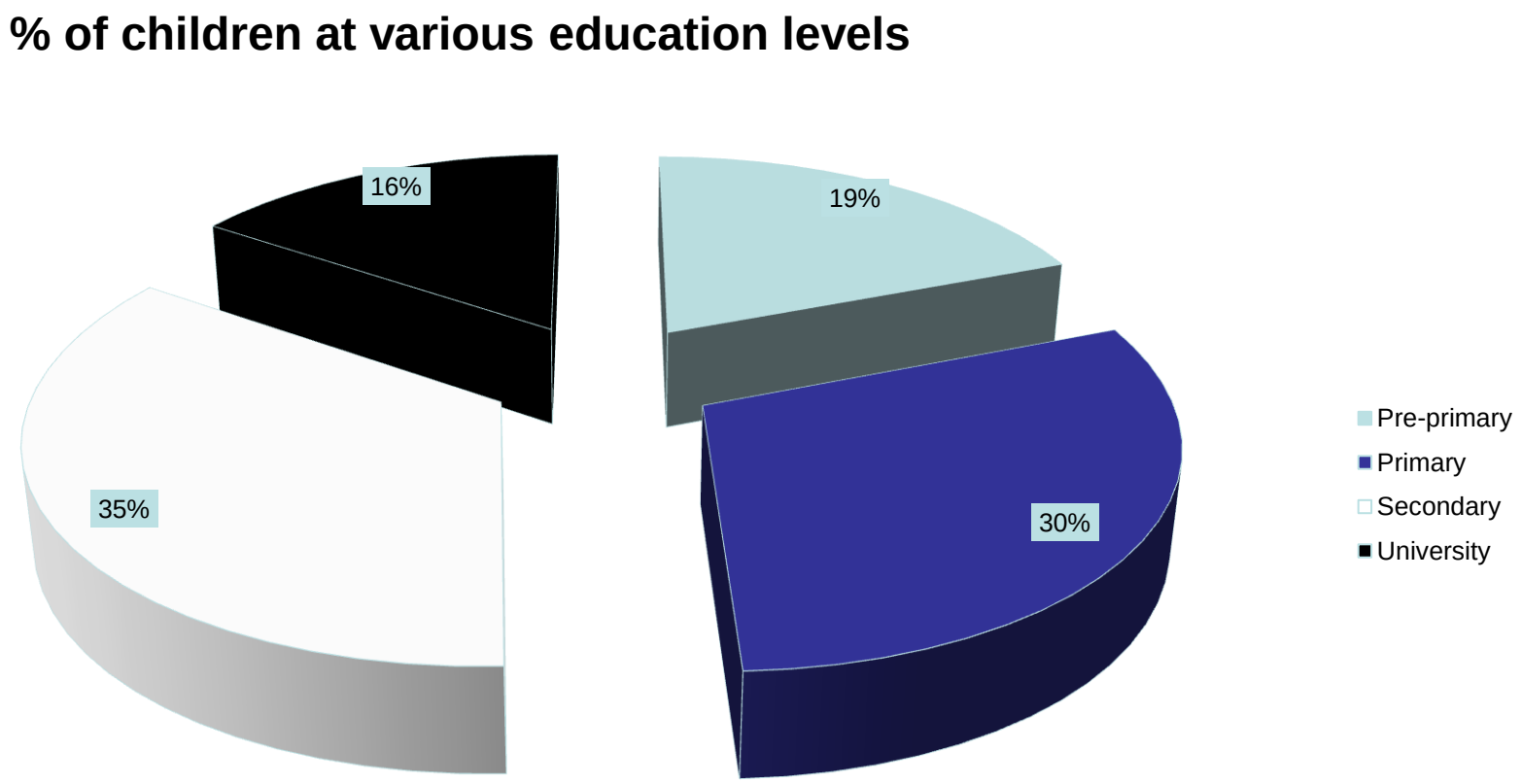
RESULTS AND DISCUSIONS

- **Household characteristics**
- The study shows that 62.7 % of the respondents were male while 37.3% were female thus implying men are the owners of tea farms (Cash crops)
- The results shows that 73.1% were HH heads while 20.6% were spouses
- 42.4% of the respondents have completed primary education,38.2% secondary,5.4% college/tertiary and1.4% having University degree

Marital status



% of children at various education levels



Occupations the respondent

- The study revealed that most respondents were involved in crop husbandry and animal husbandry with a percentage of 93.6% and 81.1% respectively.76.6% depended on agriculture for livelihoods with only 2.9% being in salaried employment, 9.0% were in private business, 6.9% engage in casual labor, 2.0% involved in artisan works, with only a meager 0.6% earning a pension

Economic status of household

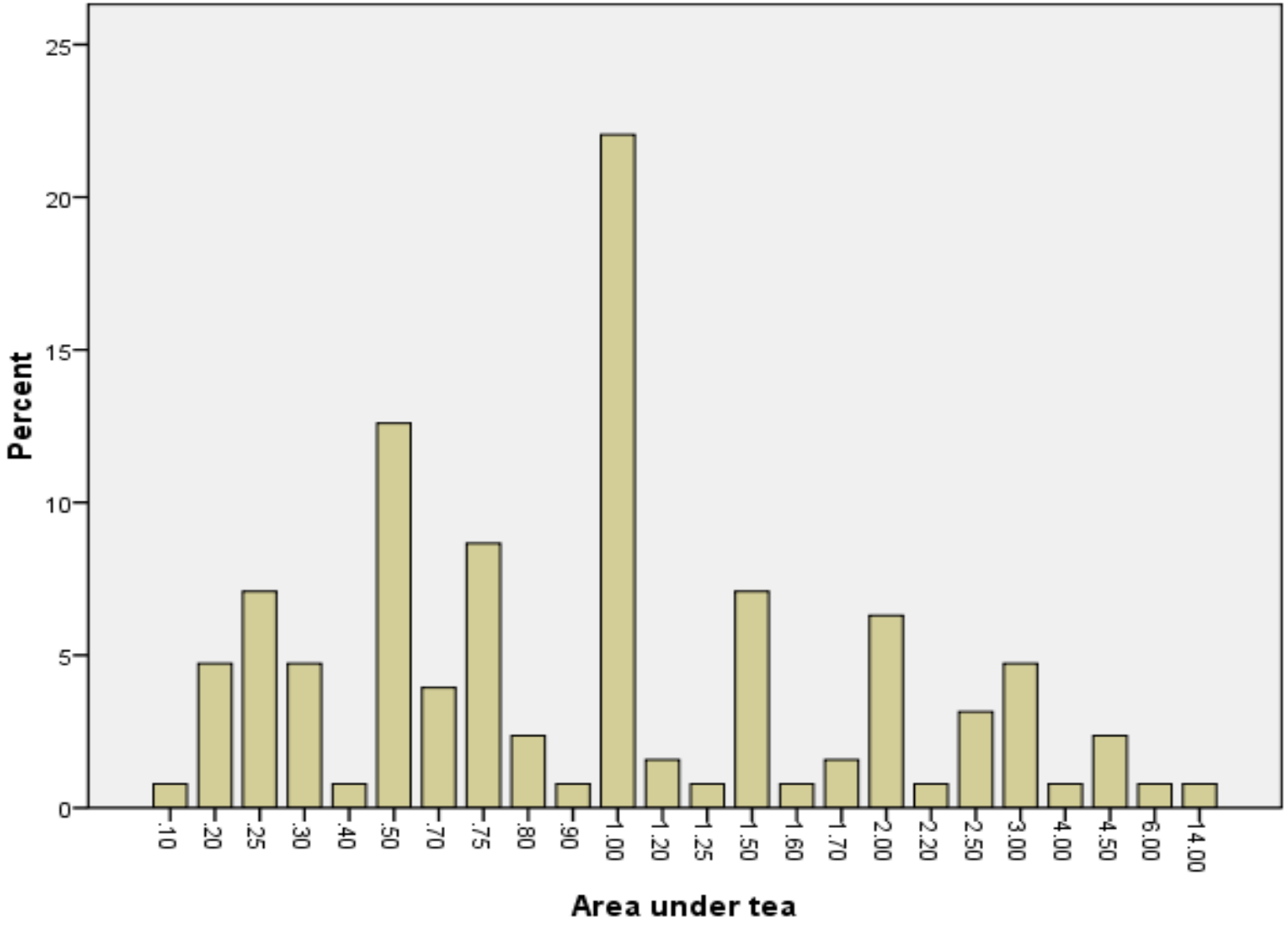
The study shows that the economic status of most respondents were rated at:

- 4.4% as above average,
- average where 81.3%,
- 11.7% as below average,
- no response 3.4%
- The interpretation here is that 85.7% of the respondents are relatively stable economically

Access to land and Social amenities

- The study reveals that 99% of the population had access to land with each HH having an average of 3 acres while there are some tea farmers who only had 0.2 acres under tea
- 94% and 91.4% of the respondents were in possession of a radio and mobile phone
- 28.3% had access to electricity,97.7% had shelter and 96.6% of respondents had access to health care. Most homesteads being semi-permanent.

Area under tea



Mean annual Income of farmers

Estimated HH annual income	Estimated HH annual expenditure	Annual savings
Tea Famers		
East of Rift		
146,688.00	89,034.00	57,654
West of Rift		
87,466.80	69,498.00	17,968.80
Non tea farmers		
East of Rift		
55,812.70	59,599.90	-37,87.00
West of Rift 86,742.10	39,231.00	47,511.00

Proportion of land under tea and expected incomes in the West of Rift.

Proportion of land under tea	% farmers	Av. land under tea	Av. Yield Kg GL/Bush	GL per acre(4,000 bushes)	Average price(Ksh/KgGL)	Expected annual income/ Acre of tea	HH Annual expenditure	% of expenditure covered by tea earnings	Expected savings from tea earnings
0.3	36	1.6	0.8	3,200	39.80	38,208	158,530	24	-120,322
0.5	51	1.6	0.8	3,200	39.80	63,680	158,530	40	-94,850
0.9	13	1.6	0.8	3,200	39.80	114,624	158,530	72	-43,908

Expected income loss resulting from 30% loss in productivity due to climate variability in the West of Rift.

Proportion of land under tea	% farmers	Av. land under tea	Av. Yield	GL per acre (4,000 bushes)	Av. price(Ksh/KgGL)	Expected annual income/ Acre of tea	HH Annual expenditure	% of expenditure covered by tea earnings	Expected savings from tea earnings
0.3	36	1.6	0.8	2,240	39.80	26,745.60	158,530	11	-131,784.40
0.5	51	1.6	0.8	2,240	39.80	44,576.00	158,530	19	-113,954.00
0.9	13	1.6	0.8	2,240	39.80	80,236.80	158,530	34	-78,293.20

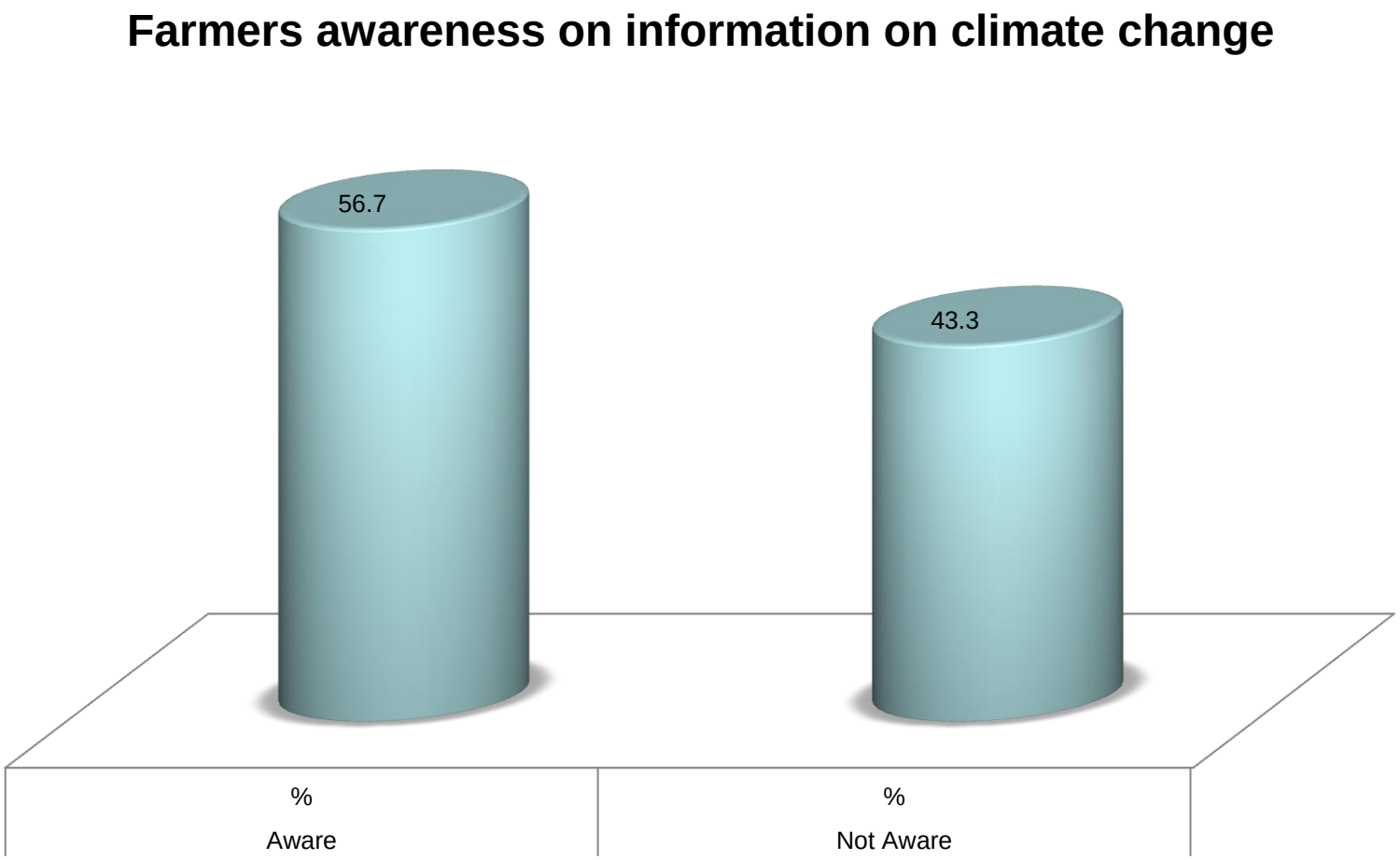
Proportion of land under tea and expected income in the East of Rift.

Proportion of land under tea	% farmers	Av. land under tea	Av. Yield Kg GL/Bush	GL per acre (4,000 bushes)	Average price (Ksh/KgGL)	Expected annual income/ Acre of tea	HH Annual expenditure	% of expenditure covered by tea earnings	Expected savings from tea earnings
0.3	18	1.7	1.57	6,280	52.70	99,286.80	158,530	62	-59,243.20
0.5	38	1.7	1.57	6,280	52.70	165,478	158,530	100	6,948.00
0.9	43	1.7	1.57	6,280	52.70	297,860	158,530	100	139,330

Expected income loss resulting from 30% loss in productivity due to climate variability in the East of Rift.

Proportion of land under tea	% farmers	Av. land under tea	Av. Yield Kg GL/ Bush	GL per acre(4,000 bushes)	Average price(Ksh/ KgGL)	Expected annual income / Acre of tea	HH Annual expenditure	% of expenditure covered by tea earnings	Expected savings from tea earnings
0.3	18	1.7	1.57	4,396	52.70	69,500.80	158,530	43	-89,029.20
0.5	38	1.7	1.57	4,396	52.70	115,834.60	158,530	73	-42,695.40
0.9	43	1.7	1.57	4,396	52.70	208,502.30	158,530	100	49,972.30

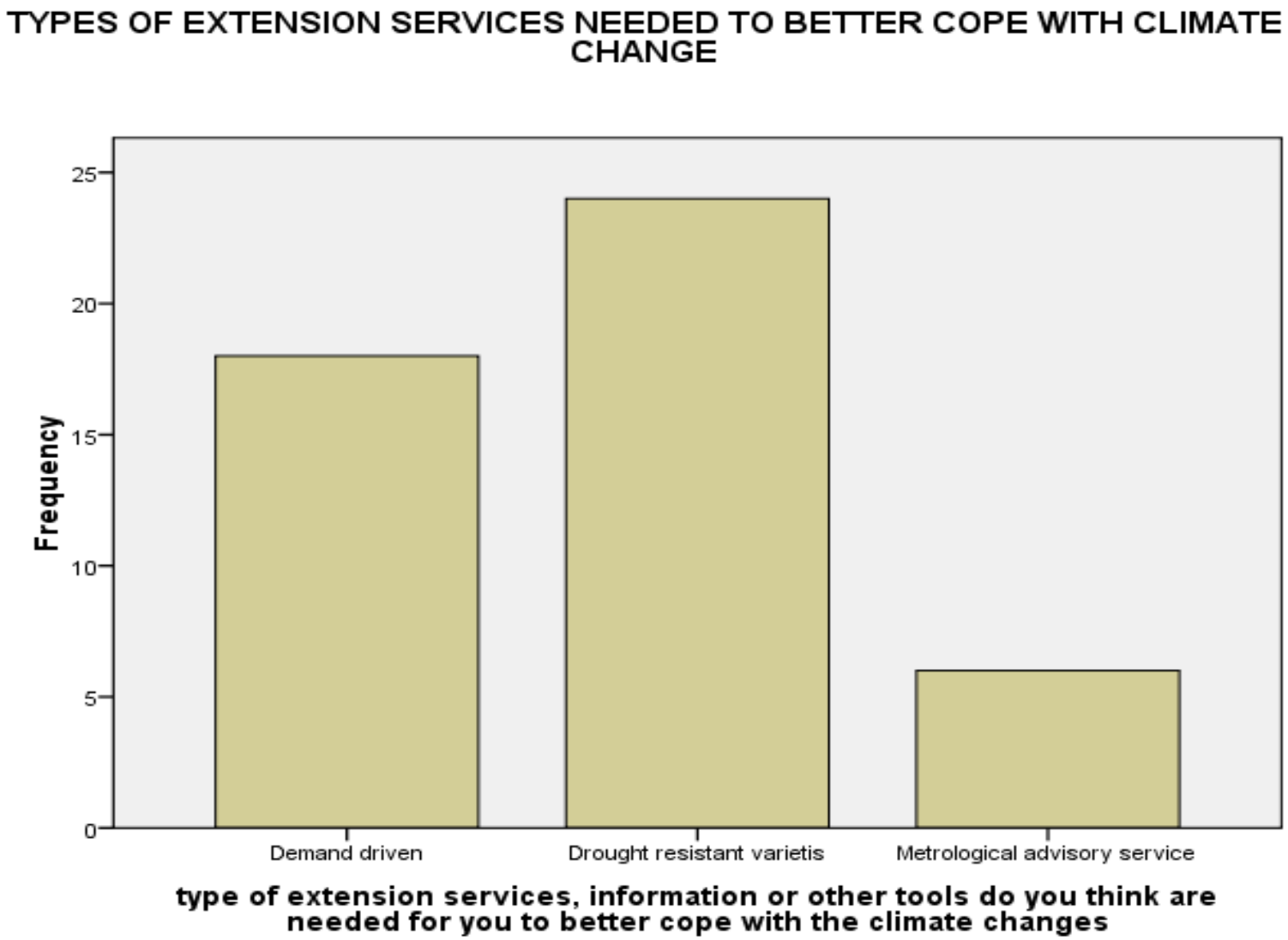
Awareness on Climate Change



Climate hazards and impacts(10 yrs)

	Experienced	Not experienced	Significance/impact
Climate hazards and impacts	**%**	**%**	
Storm	16.6	83.4	Low
Changes in rainy and dry seasons, leading to changes in planting seasons, etc.	43.1	56.9	High
Drought	34.6	65.4	High
Flood	5.1	94.8	Low
Climate related land or mud slide	5.7	94.2	Low
Increased water surface temperature	13.9	86.1	Low
Frost	35.6	64.4	High
Hotter climate	12.0	88.0	Low
Cooler climate	28.1	71.9	Medium
Hail	19.4	80.6	High

Services desired from Gok and agencies



- 50.0% of those who were sampled felt that there should be intensification of research on drought tolerant varieties/clones
- According to the analysis it was revealed that 37.5% of the farmers wanted information to be provided to them on demand basis
- 12.5% felt that there is insufficient information on metrological advisory services flowing to them to enhance the productivity in their farms and that there is need for a direct linkage between farmers and metrological department for advisory services. This is evident since most farmers knew about the term climate change but they could not clearly define what it is all about

Vulnerability to climate change

- Frost though occurring in few areas both in the East and West has been on the increase in the recent past in terms of frequency and intensity. 2.7% of farmers in the East plant cultivars tolerant to frost bites with 6% of farmers in the West planting the same to mitigate against the negative impact of frost.
- According to the respondents the major impacts of climate change included, frost, hail, drought and change/shift of seasons

- 72.5% of farmers in East and 38% in the west of Rift use crop diversification as a means of mitigating on negative impacts of climate change. 2.7% and 8% of farmers in the East and West of Rift respectively plant drought tolerant cultivars as a mitigation measure for climate change

- In the event of a loss of up to 30% farmers in the East will loss a total of Ksh 48,960 thus earning Ksh annually 114,248. This is an equivalent of 47% of the households in the growing areas earning less a dollar (Ksh 52.89 daily) at the household level in the event of climate variability.
- Farmers in the West earn an average of Ksh 39.84 annually. In the event of a loss of up to 30% due to climate variability the farmer will loss up to Ksh 18,720 thus realizing an annual income of Ksh 43,680 an estimate of Ksh 20.22 per person per day (Far below a dollar per day). This means 56% of the households in tea growing will be living below the poverty line in Kenya.

Coping strategies and Resiliency

- Frost incidents and frequency of hail damage was rated high (50%) among the emerging challenges, and its severity ranged from low to medium
- Coping strategies employed by respondents included irrigation technology 16%, tree planting 12%, shelter belt and the of food crop diversification 58%
- In the study area there was no clear process of long-term adaptation and short-term adjustment to the issues surrounding climate change regime, this suggests that the small holder tea farmers may not be quite resilient to adverse change.

Mitigation measures

- Irrigation technology 51%
- Tree planting and planting of drought tolerant crop varieties 13.2%
- Planting of frost tolerant crop varieties 13%
- Planting of pest and diseases tolerant crop varieties 8.7%
- None 18.4 %
- Crop diversification(72.5% in the East and 38% in the West) this includes

Conclusion and Recommendations

- Agricultural policy must have an important role in influencing Kenya's agricultural sector's ability to adapt successfully to climate change
- There is a need to incorporate climate change considerations into agricultural development plans to be able to reduce on its socio- economic impacts among the smallholder tea producers in Kenya
- Farmers need to be given timely information on weather and climate change scenarios so as to be able to prepare adequately in time of climatic stress
- Development of drought tolerant and frost resistant tea clones is a very important mitigation measure for tea farmers
- Irrigation can be evaluated as an option to mitigate on climate change impacts

END

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