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**EFFECTS OF ENVIRONMENTAL VARIABILITY AND RESOURCE
CONFLICTS ON FOOD INSECURITY IN KERIO VALLEY BASIN, KENYA**

BY

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C82/20106/2012

**A THESIS SUBMITTED TO THE SCHOOL OF LAW, ARTS AND SOCIAL
SCIENCES IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
THE AWARD OF THE DEGREE OF DOCTOR OF PHILOSOPHY IN
SOCIOLOGY (SECURITY AND DEVELOPMENT) OF THE KENYATTA
UNIVERSITY**

Kiptoo, Laxmana Peter
*Effects of environmental
variability and resource*



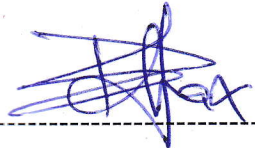
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DECLARATION

This dissertation is my original work and has not been presented for a degree in any other university or any other award.



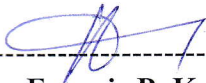
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DEDICATION

I would like to dedicate this Ph.D. Thesis to the people of Kerio Valley basin for their resilience to overcome tough challenging environment and constant conflicts over period of time to conquer, survive and thrive.

Special mention is also to those who gave me the opportunity to start my higher education journey; the late Dr. Bennie Faul and Koko Hellen Faul. This family fully paid for my first and second Degree. As a result, I have personally funded my doctorate degree to honour and advance their efforts. I would not have made to this far without them planting a seed in my academic life. Thank you.

ACKNOWLEDGEMENT

I want to acknowledge Kenyatta University for admitting me to pursue my post graduate education through the department of sociology, gender and development studies. I want also to thank my supervisors, Dr. F. P. Kerre and Dr. H. Rono for the invaluable input to this thesis. Their constant guidance and intellectual knowledge helped me this far, and without their guidance, I would not have made it.

Similarly, I want to acknowledge members of the faculty, department of sociology and gender for their input since the beginning of my doctoral program. Their input and guidance right from presentations of the concept paper, proposal presentations, research findings presentation are very much appreciated. Much appreciation to my colleague and classmate Dr. Agnes Kirui who was my partner in most classes and we encouraged each other during this doctorate stud.

I also acknowledge the efforts of my lead research assistant during data collection, Tobias Wabomba. He guided the other data collectors namely Thomas Kimutai, Luka Sutter, Evangelister Lourien, Dalton Kaliso, Matthew Korwatum, Timothy Lomeri and Late Benjamin Sum. Much appreciation also goes to Christine Kerina who assisted during data capture, coding and analysis.

Finally, I acknowledge efforts of Pauline Sisa, my spouse for her efforts and input in editing and proof reading this thesis. Above all, I acknowledge the almighty God for giving me the opportunity to study and good health for the entire duration of my study.

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LIST OF ACRONYMS AND ABBREVIATIONS

AHL	Average Household Livestock
AHLH	Average Household Land Holding
APL	Agro-pastoral livelihoods
APP	Agro-pastoral production
ASAL	Arid and Semi-Arid Lands
ASAR	Arid and Semi-Arid Region
CAPP	Community Agro-Pastoral Production
CALR	Community Ancestral Land Rights
CAR	Central African Republic
CCAFS	Climate Change, Agriculture and Food Security
CCRs	Clan-Customary Rights
CIDP	County Integrated Development Plans
CLA	Community Land Act 2016
CLUR	Community Land Use Rights
EFI	Experience of food insecurity
EHOA	East and Horn of Africa
EMC	Elgeyo Marakwet County
FAO	Food and Agriculture Organization of the United Nations
FGD	Focus Group Discussion
FIES	Food insecurity Experience Scale
GDP	Gross Domestic Product

GHI	Global Hunger Index
HLH	Household Land Holding
IDP	Internally Displaced Person
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
IERC	Inter-Ethnic Resource Conflicts
IIEC	Intensity of the Inter-Ethnic Conflicts
IPCC	Intergovernmental Panel on Climate Change
KARI	Kenya Agricultural Research Institute
KRB	Kerio River Basin
KII	Kenya Informant Interviews
KNBS	Kenya National Bureau of Statistics
NKVT	Northern Kerio Valley Triangle
LHA	Land Household Allocation
NACOSTI	National Commission for Science, Technology, and Innovation
NGO	Non – Governmental Organization
NKB	Northern Kerio Basin
NKV	Northern Kerio Valley
NWBC	North West of Baringo
RTI	International Research Triangle Institute
RAP	Resilient Agricultural Production
RAPP	Resilient Agro-Pastoral Production
TAP	Transformative Agricultural Production

SDG	UN Sustainable Development Goals 2015
SHAP	Smallholder agricultural production
SSA	Sub-Sahara Africa
SAR	Semi-Arid Region
SAP	Smallholder Agricultural Production
SWOT	Strength Weakness Opportunity and Threats
UDHR	Universal Declaration of Human Rights (1948)
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children Fund
USAID	United States Agency for International Development
WB	World Bank
WBG	World Bank Group
WFP	World Food Program
WFS	World Food Summit
WHO	World Health Organization
WPC	West Pokot County

OPERATIONAL DEFINITIONS OF TERMS

The following terms were used in the study with the following operational definitions

Agro-Pastoral Production	Refers to occupations or livelihoods based on crop cultivation and livestock production; a common practice in arid and semi-arid regions
Community Agro- pastoral production	Refers to collective or shared use of resources such as land, grazing, water or agricultural cultivation among members of agro-pastoral community; particularly in terms of a family, clan, community or even more than one community
Environmental variability	Refers four (4) key components of environment, namely 1) variation of agro-ecological zones, 2) climate changes, 3) rainfall variability and 4) drought cycles
Experience of food Insecurity	Refers to reported experience of food insecurity by a household in a graduated scale from 1) no deficiency to 2) mild deficiency to 3) moderate deficiency to 4) acute/severe deficiency; based on FAO/FSAU (2006) and IPCC/FAO scale on food insecurity and hunger
Household	A residential unit (homestead) with occupants who usually are related, share responsibilities, food, and a household head. Typically, a household may consist of a father, mother and a child or children; sometimes a single parent and a child, or children
Food Security	Used consistent with WFS and FAO characterization of adequate availability and access at all times of food which meet required preferences, necessary nutritional value and healthy living
Food insecurity	Used consistent with WFS and FAO characterization of increasingly inadequate availability and access of food, deficiency of required food preferences and necessary

	nutritional value, leading to hunger, starvation and negative health outcomes
Livelihood	A means of supporting existence, necessities of life; including any one of the five key livelihood assets i.e. natural resources, physical infrastructure, human capital, social capital, and financial resources,
Nature of food insecurity	Used in general to refer to four (4) dimensions of food insecurity consistent with WFS and FAO characterization; namely 1) inadequate availability and access at all time of basic food, 2) deficiency of required food preferences and necessary nutritional value, 3) phase scale (level of severity) of food deficiency based on FAO/FSAU (2006), IPCC/FAO (2015) scale on food insecurity and hunger; 4) negative health outcomes
Nomadic pastoralism	Herding (or moving) livestock from one place to another in search of pasture and water
Pastoralist	A person (household) whose primary occupation is herding (or managing) livestock
Sustainable Livelihoods	The ability of the livelihoods (assets) to withstand or recover from external shocks (pressure, interruptions) such as environmental and social conflicts
Livelihoods Outcomes	Results (achievements) of livelihood strategies that may include increased income, well-being, reduced vulnerability, improved food security, etc.
North Kerio Valley Triangle	North Kerio Valley refers to northern part of the Kerio River with a triangle border consisting of the Pokot of Tiaty of Baring County, Marakwet of the Elgeyo-Marakwet County, and the Pokot of the West Pokot County

Marakwet	A sub-ethnic community of the ethnolinguistic Kalenjin community of Kenya; an agro-pastoral community bordering the Baringo County at the Kerio Valley and West Pokot County also at the Kerio Valley and the highlands in the north.
Pokot	Also, a sub-ethnic community of the ethnolinguistic Kalenjin community of Kenya; a largely pastoral community living in West Pokot County, Tiaty in Baringo County, and in the Pokot District of the eastern Karamoja in Uganda.
Tugen	Also, a sub-ethnic community of the ethnolinguistic Kalenjin community of Kenya; a largely agro-pastoral community living in Baringo County and stretching to Nakuru and Laikipia Counties. The Tugen community borders Pokot in Tiaty and the Marakwet along the Kerio Valley.
Vulnerability to Food Insecurity	Persons, households, or communities who are exposed to situations (processes) that may push them into food insecurity, hunger, or starvation
Resilient Agricultural Production	Adapting practices and technologies to mitigate adverse environmental variability, support continuity, and improve agricultural production
Resilient agro-pastoral production	Ability to mitigate adverse environmental variability, support continuity, and improve the productivity of crop and livestock production

ABSTRACT

Food insecurity continues to be a major challenge in the world. By 2018, one-third of the global population experienced food insecurity. A greater proportion of the population that experienced food insecurity were in Sub Sahara Africa (SSA), East and Horn of Africa, and Northwestern Kenya including Kerio Valley. Accordingly, the purpose of this study was to assess the nature of food insecurity and the drivers in Northwestern Kenya particularly Northern Kerio Basin, a semi-arid valley. More specifically, the objectives of the study were to assess the demographic characteristics of the local communities in Northern Kerio Valley Basin, the nature of food insecurity, the nature of agro-pastoral production, the effects of resource-ethnic-conflicts on food insecurity, the effects of the environmental variability and to identify mitigation measures to achieve food security and development. The study site was Northern Kerio Valley, a triangle border consisting of Kolowa Ward of Tiaty in Baringo County, Endo Ward of Elgeyo Marakwet County, and Lomut Ward of the West Pokot County. The target population for the study was the 2600 households in which a sample size of 387 was determined using Yamane (1967) formula for finite and small populations. Qualitative data were collected through Key Informants Interviews (KIIs) and the Focused Group Discussions (FGDs). The primary quantitative data were collected through a questionnaire which also incorporated an adapted phased experience of food insecurity scale based on FAO/FSAU (2006) and IPCC/FAO (2015) to assess the prevalence of food insecurity. The study established that Northern Kerio Basin was characterized by a young population, limited formal and vocational education, limited occupation opportunities and extensive poverty. The study established also that 98% of the households lived in a community or clan land, where 89% had customary rights to use 1-2 acres of land for the homestead and cultivation. The community (clan) land and limited access rights were associated with open resource access and limited agricultural innovation and production. The study established that 60% of the households experienced three or more resource-ethnic conflicts in the last five years and 60% reported severe impact on access to food and livelihoods; 90% of the households also experienced more than three drought cycles in the last five years and 70% reported severe impact on their access to food and livelihoods. More importantly, the study concluded that 48% of the food insecurity had been influenced by the joint effects of environmental variability and resource-ethnic conflicts. The study recommended adoption of resilient and transformative agricultural production, and adoption of measures to mitigate environmental variability and related resource conflicts; rethink and repurpose agricultural production by embracing modernized agricultural practices; diversification of agro-pastoral occupations in arid and semi-arid zones; carryout land reforms in North Kerio Valley Basin with emphasis on land demarcation and adjudication with a view to enhance food production, address the 'tragedy of commons, reduce environmental degradation and related resource conflicts. Adoption of measures that would mitigate environmental vulnerability including enhanced and modernized irrigation technologies and farm mechanization. Adopt measures that would enhance socio-economic empowerment, including expanded formal and vocational education and expanded occupation opportunities beyond the limited agro-pastoralism.