Research Application Summary

Socio-economic determinants of livelihood vulnerability to rainfall variability in semi-arid Kenya

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Abstract

Rain-fed crop farming in the arid and semi-arid lands (ASAL) in sub-Saharan Africa has been severely affected by rainfall variability. The objective of this study was to identify socio-economic factors exacerbating the effects of rainfall variability on livelihoods of households in the semi-arid lands of Kenya. A survey was conducted in Kitui South sub-County in southeastern Kenya, using a semi-structured questionnaire, administered to a sample of 311 crop farming households. The study established that gender, education level, household size, income, size of land cultivated and income sources had significant contribution to households' vulnerability to rainfall variability. Based on the Livelihood Vulnerability Index (LVI), it was revealed that households were generally vulnerable thus the need for interventions targeting rainfall variability effects to improve livelihoods of communities in the ASALs of Kenya.

Key words: Education, gender, Kenya, livelihood vulnerability index, rainfall variability

Résumé

L'agriculture pluviale dans les zones arides et semi-arides (ASAL) de l'Afrique subsaharienne a été sévèrement affectée par la variabilité des précipitations. L'objectif de cette étude était d'identifier les facteurs socio-économiques exacerbant les effets de la variabilité des précipitations sur les moyens de subsistance des ménages dans les terres semi-arides du Kenya. Une enquête a été menée dans le sous-comté de Kitui South, au sud-est du Kenya, à l'aide d'un questionnaire semi-structuré, administré à un échantillon de 311 ménages agricoles. L'étude a établi que le sexe, le niveau d'éducation, la taille du ménage, les revenus, la taille des terres cultivées et les sources de revenus contribuaient de manière significative à la vulnérabilité des ménages à la variabilité des précipitations. Sur la base de l'indice de vulnérabilité des moyens de subsistance, il a été révélé que les ménages étaient généralement vulnérables, d'où la nécessité d'interventions ciblant les effets de la variabilité des précipitations pour améliorer les moyens de subsistance des communautés dans les ASAL du Kenya.

Mots clés: Éducation, genre, Kenya, indice de vulnérabilité des moyens d'existence, variabilité des précipitations

Introduction

Rain-fed farming in the semi-arid lands (ASALs) of sub-Saharan Africa is heavily affected by seasonal rainfall variability; thus exposing crop farming households to relentless food insecurity and general deterioration in their livelihoods (Macharia *et al.*, 2012). In the recent years, major changes in rainfall characteristics have occurred in countries like Kenya, particularly in terms of onset, amount, duration and cessation, with devastating effects on crop production, especially in the ASALs (Marigi *et al.*, 2016).

Human activities have been greatly associated with the acceleration of the rainfall variability effects; though the specifics related to the dimensions of contribution remain unclear. This study, therefore, sought to identify socio-economic factors exacerbating the effects of rainfall variability on livelihoods of households in the ASALs of Kenya.

Methodology

A survey was conducted in Kitui South sub-County in the semi-arid Southeastern Kenya (longitude 38°31'E and 38° 58'E; latitude 1°35' S and 3°04' S). The area experiences unreliable rainfall, in spite of over 87% of the communities deriving their livelihoods from agriculture (Republic of Kenya, 2014). The sub-County was purposively sampled due to the dominance of rain-fed agricultural activities, and as a typical representation of the ASALS in Kenya.

A semi-structured questionnaire was administered to 311 households' heads. Livelihood Vulnerability Index (LVI) for each household was calculated using Inter-governmental Panel for Climate Change (IPCC) framework, which ranges from -1 (not vulnerable) to +1 (extremely vulnerable) (IPCC, 2014). Multiple linear regression analysis was used to determine factors which significantly affect livelihood vulnerability.

Results and Discussion

Multiple linear regression results showed that six factors (gender, education, household size, income source, income and cultivated land size) had significant contributions to livelihood vulnerability of the households (Table 1). An educated household head was likely to secure off-farm employment leading to income diversification, thus reducing vulnerability to rainfall variability. Likewise, household whose income was solely from selling farm produce was likely to be vulnerable in the event of insufficient rainfall. Similarly, a household with a small farmland could not diversify crop production, which invariably led to food shortages. Thus, households in the semi-arid lands with educated heads, whose incomes are supplemented by off-farm employment, or with large farmlands are more resilient to rainfall variability and may be more food secure than their counterparts.

It was apparent that households with many family members (more than five) were likely to exhaust their food harvests within a short time (Table 1) making them more vulnerable; thus implying that family planning could be a viable option in this region of the country. Households with low incomes and high expenditures were unable to make significant savings (Table 1), thus exacerbating their vulnerability to rainfall variability effects. Lack of capacity to diversify crops grown was common among household that cultivated a small piece of land. This predisposed the households to the effects of unfavourable rainfall seasons, and subsequently to food insecurity.

Hence, scientifically backed multi-food crop campaigns should be infused within the ASALs' crop production programmes in Kenya.

Table 1. Contribution of determinants of Livelihood Vulnerability Index to households in the semi-arid lands of Southeastern Kenya

Variable	Coefficient	Standard Error	T	P-value	95 % Confidence Interval	
Gender	0.024	0.007	3.35	0.001*	0.010	0.038
Education	0.028	0.006	4.61	<0.001*	0.016	0.039
Age	0.009	0.005	1.87	0.062	-0.001	0.017
Household size	-0.023	0.006	-4.12	<0.001*	-0.033	-0.012
Income source	-0.015	0.006	-2.64	0.009*	-0.027	-0.004
Income	0.034	0.005	6.36	<0.001*	0.024	0.045
Expenditure	0.004	0.006	0.69	0.493	-0.008	0.016
Land size	-0.001	0.005	-0.16	0.870	-0.011	0.009
Rented land size	-0.017	0.012	-1.38	0.170	-0.041	0.007
Cultivated land size	0.023	0.008	2.71	0.007*	0.006	0.040
Farming years	-0.002	0.005	-0.42	0.674	-0.012	0.008
Constant	-0.051	0.040	-1.26	0.209	-0.131	0.029

* Significant at 0.05

Conclusions and Recommendations

The main socio-economic determinants to livelihood response to rainfall variability in the ASALs in Kenya included gender, education level, household size, income, size of land cultivated and income sources. The study recommends interventions to enhance crop production diversification and savings by households.

Acknowledgement

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