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Effect of the Hunger Safety Net Programme on Household Food Insecurity: Lessons from Marsabit County, Kenya

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

This study assessed the effects of the Hunger Safety Net Programme in reducing household food insecurity in Marsabit, County, Kenya. Worldwide, social safety programmes have largely been implemented in the drylands targeting vulnerable households. However, poverty and food insecurity remain high, especially in arid and semi-arid lands. The study employed a survey research design.

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Data was collected between October 2023 and December 2023 targeting 334 households who had graduated from the Hunger Safety Net Programme in Marsabit County, Kenya. The findings indicate that 10.8% of the respondents were food secure, 3.3% were mildly food insecure, 2.7% were moderately food insecure and 83.2% were severely food insecure. Simple regression analysis indicates that cash transfer amount, adequacy of cash transfer, and duration of support had a statistically significant ($p<0.05$) effect on food insecurity. Multiple linear regression further reveals that households whose main livelihood was business, $b=-0.171$, $p=0.007$, casual labour, $b=-0.119$, $p=0.036$, and remittances, $b=-0.140$, $p=0.039$ were significantly associated with a lower likelihood of food insecurity. The study concludes that despite a slight improvement in households on their food security through Hunger Safety Net Programme support, the majority were still food insecure. The study suggests an increment of the cash transfer amount, a longer duration of beneficiaries in the programme, and the introduction of conditional seed capital to the beneficiary to start income-generating activities to enhance food insecurity.

Keywords: *Adequacy of cash transfer; duration of support; food insecurity; hunger safety net programme; social safety nets; training.*

1. INTRODUCTION

Food insecurity remain a complex global issue requiring urgent interventions. In 2023, the global prevalence rate of food insecurity remained high at 28.9%. The most affected population being in the low-income countries where 71.5% of people could not meet daily dietary intake. It is further predicted that by 2030, 53% of the world's population will still be experiencing food insecurity, with 53% of the population coming from Africa (FAO et al., 2024).

Nearly 5.5 million children in the Horn of Africa suffered from acute malnutrition by March 2022, while over 14 million individuals experienced food insecurity (International Federation of Red Cross, 2022). Cases of food hunger are still on the rise in Africa with one out of every five people facing hunger in 2023 (FAO et al., 2024). In 2018, 22.20% of the Kenyan population faced food insufficiency. The number increased to 23.00% in 2019, 24.70% in 2020, and 27.80% in 2021 (Kenya Hunger Statistics, 2022). The upward trend was majorly contributed by the COVID-19 pandemic, droughts, and locust invasion. Kenya scores 25.0 within the severity scale of 9.9-50, indicating a serious level of hunger, and this has increased from the GHI score of 21.6 in 2014 (Global Hunger Index, 2024). In Marsabit County, the household food consumption score decreased from 70.6% in 2018 to 65.5% in 2019, with the nutrition status of children deteriorating. Acute malnutrition among women has also remained high at 11.3% in 2018 and 10.0% in 2019 (Marsabit County SMART Survey Report, 2019-2022).

Globally, member states of the United Nations are committed to realizing the 2030 sustainable development goal number two of achieving zero hunger (Carlsen & Bruggemann, 2022; Katila et al., 2019). One of the strategies for achieving this is leveraging social safety nets (SSNs) as part of social protection systems to mitigate the adverse impacts of food insecurity among vulnerable populations (Ivaschenko et al., 2018; Grosh et al., 2008). Social protection, which includes social insurance like pension schemes and social assistance programmes such as direct cash or in-kind transfer programmes, has been a crucial part of development since the late 1990s (World Bank, 2001; Seekings & Nattrass, 2015). The effectiveness of social protection highly depends on political goodwill and elite ideology on human welfare in a country. Therefore, the design and implementation of social protection systems differ worldwide (Seekings, 2016).

Kenya is a signatory of the United Nation's Sustainable Development Goals (SDGs). The Kenyan government has been committed to addressing goal number two of zero hunger through the introduction of social protection systems to ensure all people have access to sufficient and nutritious food. For example, the Hunger Safety Net Programme in Kenya is an unconditional cash transfer programme that addresses poverty reduction and food insecurity in arid and semi-arid lands through the provision of monthly cash to registered households (Merttens et al., 2013). It is currently implemented in eight counties namely Turkana, Wajir, Mandera, Marsabit, Garissa, Isiolo, Samburu, and Tana River. Other cash transfer schemes in Kenya include Older Persons Cash Transfers, Cash Transfers for Orphans and

Vulnerable Children, and Persons with Severe Disability Cash Transfers (Government of Kenya, 2016). According to Song and Imai (2019), multi-dimensional poverty in Kenya is mainly caused by food insecurity. Using a longitudinal survey, the Hunger Safety Net Programme was found to be successful in reducing poverty since the multi-dimensional poverty index (MPI) of the beneficiaries ranged from 0.046 to 0.048. The authors further found that the Government of Kenya was putting efforts towards institutionalizing social protection systems.

Elmi and Minja (2019) highlight that the Hunger Safety Net Programme has been critical in building household resilience to food insecurity in Wajir County, Kenya. However, during the study, the Programme faced many challenges, such as poor implementation due to vested interests among some actors, which affected the targeting and enrolment. The requirement of national identity cards among the receipts also made the disbursement of monthly cash transfers challenging. Merttens et al. (2013) conducted an impact evaluation for HSNP 2009-2012 and noted that the Hunger Safety Net Programme beneficiaries improved their diet diversity. A significant proportion of the beneficiaries reported new businesses, as others expanded their old businesses. The beneficiaries of the HSNP were qualifying to access credits from the few available financial institutions in Northern Kenya.

Therefore, due to dearth of empirical evidence, this paper provides detailed data and discussion on the effect of the Hunger Safety Net Programme on household food insecurity in Marsabit Kenya. Other sections outlined in this paper include methodology, results and discussion based on key findings. Lastly, section four entails conclusions and recommendations.

2. METHODOLOGY

Data was collected in all the four Marsabit constituencies namely: Saku, Laisamis, North Horr, and Moyale. Marsabit is considered a Dryland County with four main ecological zones which include a sub-humid/forest zone, semi-arid/woodland zone, arid/bushland zone, and arid/scrubland zone. A survey design was adopted. The study interviewed 334 respondents who had graduated from the Hunger Safety Net Programme. Data collection took three months starting from October 2023 to December 2023. Simple linear regression analysis and multiple linear regression analysis were used to assess

the effect of Hunger Safety Net support mechanisms on food insecurity. The key indicators of the Hunger Safety Net support mechanisms were (1) Cash transfer amount, (2) Adequacy of cash transfer, (3) duration of support, and (3) training. Household demographics were introduced as covariates in the multiple regression analysis.

3. RESULTS AND DISCUSSION

3.1 Criteria for Beneficiaries Enrolment

At the time of data collection, vulnerable households were enrolled in the Hunger Safety Net Programme majorly based on the severity of food insecurity, low income, cases of mortality rates, lack of access to clean water and sanitation, availability of vulnerable persons in the household, and household coping strategies. Therefore, the respondents were requested to indicate the key challenge among the above, that qualified them to be enrolled in the HSNP and the responses were summarized in Table 1.

The majority of respondents (40%) indicated that they qualified for the Hunger Safety Net Programme cash transfers because they experienced severe food insecurity. The second highly ranked indicator for enrolment was low income as highlighted by 32% of the respondents. Households that had a vulnerable person(s) such as the elderly and persons living with disability were considered for enrolment as evidenced by 19% of the respondents. Nearly 5% of the respondents were enrolled because they had adopted coping mechanisms such as reduction of meal size, which was considered unsustainable. Lack of access to clean water and sanitation was also considered a critical parameter for enrolling households and 1% of the respondents highlighted it as a criterion used to enroll them. Lastly, child mortality rates were also experienced in the study area making 2% of the respondents qualify for cash transfer enrolment.

According to Fitzgibbon (2014), the Hunger Safety Net Programme targets the most needy households majorly focusing on indicators such as food insecurity, low income, high number of dependents (17 years and below), the elderly aged 55 years and above, chronically ill and disabled dependants. The author acknowledges that communities are involved through community-based targeting to verify the households selected through enumerators using the proxy-means test.

Table 1. Key vulnerability experienced by beneficiaries

Key Criteria for Enrolment	Frequency	Percent
Severe food insecurity	132	40
Low income	107	32
Child mortality rates	6	2
Lack of access to clean water and sanitation	4	1
Vulnerable person (s) in the household (elderly, persons with disability)	62	19
Household coping strategies (eg reduction of meal size)	19	5
Others	4	1
Total	334	100

Source: Own Survey (2023)

3.2 Duration of Support in Hunger Safety Net Programme

The study sought to investigate the timeframe between households' enrolment and graduation from the Hunger Safety Net Programme. Results are shown in Fig. 1.

The time graph in Fig. 1 indicates that the majority of the respondents, 27.19%, were enrolled in the Hunger Safety Net Programme in the year 2013. However, the registration of households declined from 2014-2023. On the other hand, the majority of the respondents, 33.03% graduated from the Hunger Safety Net Programme in 2021, followed by 17.58% in 2020 and 16.97% in 2022. A significant number of 15.45% also graduated in 2018. From the findings, most respondents took 5-9 years to graduate after enrolment,

indicating that graduation is a process that takes. The findings coincide with the narrative from the Hunger Safety Net Programme coordinator:

....In 2007-2012, we recruited vulnerable households in Marsabit County for piloting. Based on the proxy mean test, community targeting, and validation, we conducted mass registration in 2013. However, we experienced a few targeting challenges in phase one....

The findings collaborate with a report by Merttens et al. (2018) indicating that the Hunger Safety Net Programme conducted a pilot study between 2007-2012 and phase two started from 2013-2017 targeting vulnerable households in Mandera, Wajir, Turkana, and Marsabit counties in Kenya.

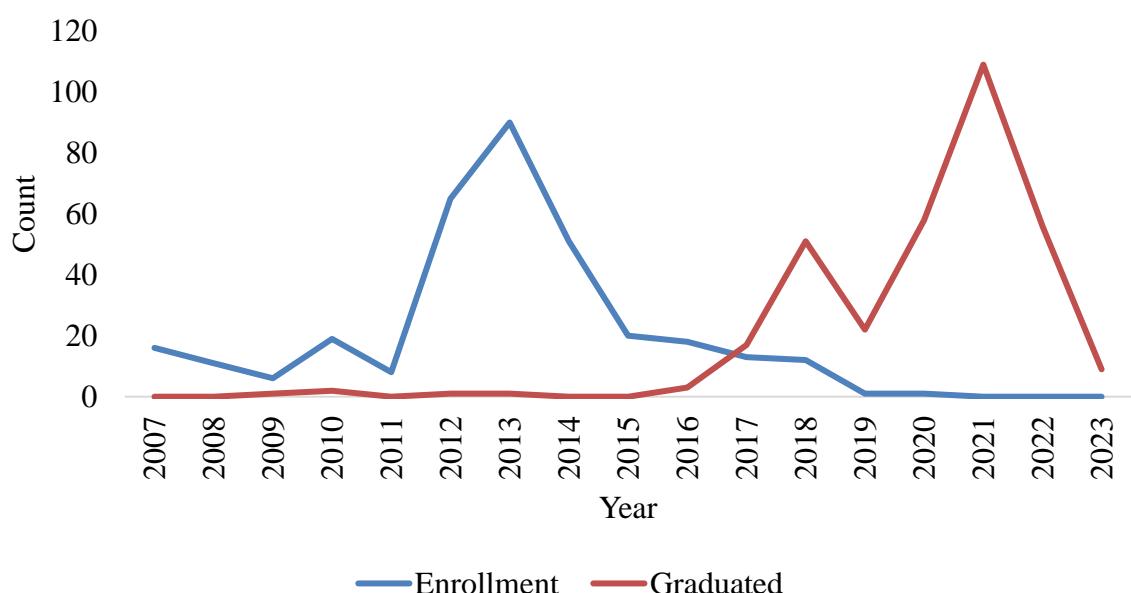


Fig. 1. Timeline graph for enrolment

3.3 Experience of Adequacy of Cash Transfer

In addition, the respondents were requested to rank their experience concerning the adequacy of the cash transfer that was given by the Hunger Safety Net Programme. The responses are summarized in Table 2.

The majority of the respondents (80%) considered the cash transfer from the Hunger Safety Net Programme as low. Those who indicated the cash transfer as moderate and high were 18% and 2% respectively. However, focus group discussants in Loiyangalani sub-location acknowledged that despite the cash being small, it helped them to meet some basic needs:

“...However little the cash transfer from HSNP was, it helped us meet household basic needs such as food. We also have a few case studies of households who invested and started businesses with the little money we got...”

One of the successful female graduates in Somare, Moyale constituency narrated how cash transfers from the Hunger Safety Net Programme made her open a retail shop in her rural place:

“....I opened a shop two years after being enrolled in the Hunger Safety Net Programme. There was a time when the disbursement of money into my account was delayed by eight months, and I received it in a lump sum and opened a retail shop. I use

profit from my business to pay for household expenditures including educating my children. I am also able to save a small amount in a Sacco and chama (social group)....”

3.4 Types of Training

The study further assessed the types of training the respondents received from the Hunger Safety Net Programme and the responses were presented in Table 3.

3.4.1 Coaching and mentorships on life skills

Coaching and mentorship on life skills were considered important life-long training. However, only 4.19% of the respondents had received this kind of training. The low number of respondents trained in life skills was justified by the Hunger Safety Net Programme coordinator who linked it to inadequate awareness creation and some beneficiaries taking the training less seriously:

“....The Hunger Safety Net Programme doesn't have a clear training schedule on beneficiaries' life skills. However, some of our partners offer such training but on a small-scale coverage. The challenge is that sensitization among the households is minimally done and most of the beneficiaries don't take this kind of training seriously...”

This implies that some efforts were made to ensure that besides receiving monthly cash transfers, the respondents also acquired life skills

Table 2. Experience of adequacy of cash transfer

Adequacy of Cash Transfer	Frequency	Percent
Low	269	80
Moderate	59	18
High	6	2
Total	334	100

Source: Own Survey (2023)

Table 3. Types of training received

Type of training	Frequency	Percent
Coaching and mentorships on life skills	179	53.59
Financial literacy	14	4.19
Guidance on asset accumulation and savings	75	22.46
Livelihoods diversification training	10	2.99
Others (specify)	44	13.17
Total	334	100.00

Source: Own Survey (2023)

in other aspects that improve human welfare. According to Sabates-Wheeler et al., (2021), beneficiaries of a social safety programme should be coached and mentored on how to manage assets and savings efficiently.

3.4.2 Financial literacy

Managing the cash transfers from the Hunger Safety Net Programme and other sources was considered more important. Only 22.46% of the respondents had received financial literacy. The training was offered by different organizations other than the Hunger Safety Net Programme. In a focus group discussion at Merille Market, Laisamis constituency, the participants confirmed that Concern Worldwide and Equity Bank trained them in financial management:

....The Hunger Safety Net Programme linked us with Equity Bank and Concern Worldwide officers who trained us on financial management. However, the training has been happening in groups, so members who mostly benefited were the ones who had joined a group in the community. Financial training gave us saving discipline and we can now borrow loans from micro-credit institutions..."

3.4.3 Asset accumulation and savings

Only 2.99% of the respondents were trained on asset accumulation and savings. However, qualitative data from focus group discussants show that accumulating assets was quite difficult for the respondents as they prioritised more on meeting basic needs:

....Very few people are interested in asset accumulation training. The monthly cash transfer was not enough to think of asset accumulation. The majority focused on meeting basic needs mostly buying food. However, with enough money and surplus, adding more productive assets is a good thing..."

Evidence shows that productive asset accumulation has an intergenerational impact. Cash transfers induce asset investments and improve household consumption levels. The authors further assert that savings groups are critical in facilitating asset accumulation among cash transfer beneficiaries (Stoeffler et al., 2020).

3.4.4 Livelihoods diversification training

The study also sought to investigate whether respondents were trained in livelihood diversification. It was established that 13.17% of the respondents were trained in livelihood diversification. Livelihood diversification was conceptualised to mean engagement in additional sources of income. Experimental evidence by Macours et al., (2022) indicates that the provision of complementary interventions such as productive investment grants facilitates the diversification of activities that generate income for households. They also enhance household risk management through multiple sources of income, which intends to cushion households' consumption levels.

3.5 Food Insecurity

Food insecurity was measured using the household food insecurity access scale. The respondents were asked to provide answers to nine standardized questions about food insecurity. The households were categorized either as food secure, mildly food insecure, moderately food insecure, or severely food insecure as shown in Fig. 2.

The majority of the respondents (83.2%) were severely food insecure, while 10.8% were food secure. Those who were mildly food insecure and moderately food insecure were 3.3% and 2.7%, respectively. This implies that despite government interventions such as the Hunger Safety Net Programmes, food insecurity remains a pertinent issue in Marsabit County. According to Marsabit County SMART Survey Report (2019-2022), the household food consumption score in Marsabit County decreased from 70.6% in 2018 to 65.5% in 2019, with the nutrition status of children deteriorating. Acute malnutrition among women has also remained high at 11.3% in 2018 and 10.0% in 2019. Further, the Mean Reduced Coping Strategy Index for households was 15.5, indicating that the households experienced moderate food insecurity, with an acute malnutrition prevalence rate of 19.6%.

Food insecurity remains a global challenge. According to Sapkota (2022), only 48.2% of the households in Nepal have access to food security. The GHI score for 2022 is at 19.1 indicating a moderate status, which has increased from 16.4 score in 2014, and slightly decreased from 20.8 and 19.5 scores in 2019 and 2020, respectively. Further, a study by Aswin

et al. (2024) in Jembayan Muara Bara Tenggarong Seberang District in Indonesia found that 32% of the households were food insecure while 68% were food insecure.

3.6 Effect of Hunger Safety Net Support Mechanisms on Food Insecurity

The study determined the effects of the Hunger Safety Net support mechanisms on food insecurity. The basic assumption was that the amount of cash transfer, adequacy of cash transfer, duration of HSNP support, and training were accompanied by propensities to influence food insecurity.

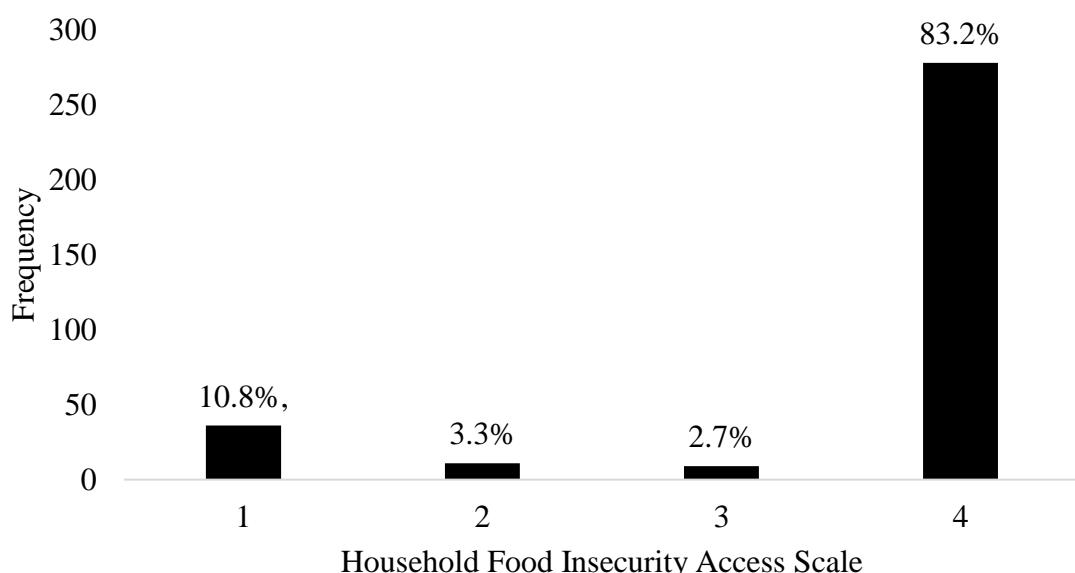
The indicators of the Hunger Safety Net support mechanisms and food insecurity were assessed with either real values or a Likert scale index. The indicators for HSNSM were 1) the amount of the Hunger Safety Net funds transferred to the individual beneficiary; which was Kshs 5400 after two months for the period the beneficiary was in the programme ; 2) the adequacy of the Hunger Safety Net funds which was assessed in Likert scale of 1 which reflected low, 2 which reflected moderate and 3 which reflected high; 3) duration of HSNP support assessed in terms of the years that the beneficiary was in the programme; and 4) lastly, training support which was assessed in terms of the number of training attended by the

beneficiary. Food insecurity which was assessed with Likert scale reflecting (a) rarely, (b) sometimes and (c) often using the nine indicators as per the Household Food Insecurity Access Scale (HFIAS).

A simple regression method was used to analyze the effects of Hunger Safety Net support Mechanisms on food insecurity. The regression technique was adopted (used) particularly because it provided an estimate of five (5) key parameters 1) B coefficient which reflected the specific effects of the Safety Net Mechanisms on food insecurity, 2) R which reflected the nature of the effects (relation), 3) R^2 (square) which reflected the percentage of the effects of the Safety Net Mechanisms on food insecurity, 4) F which reflected the ratio of the within and between variances, and 5) P which reflected the probability of error of these estimates; whether such outcomes would have occurred by chance.

3.6.1 Effect of cash transfer amount on food insecurity

The study assumed that the funds transferred by the Hunger Safety Net Programme to the beneficiaries would have some effect on food insecurity. The results were summarized as follows:



1=Food secure, 2=Mildly food insecure, 3=Moderately food insecure, 4=Severely food insecure

Fig. 2. Summary of household food insecurity status

The results indicated that the funds transferred by the HSNP to the beneficiaries had some effects on six (6) indicators of food insecurity. Worry that your household would not have enough food, $r=0.145$, $p=0.017$; not able to eat preferred foods because of lack of resources, $r=0.130$, $p=0.033$; eating a limited variety of foods due to a lack of resources $r=0.152$, $p=0.011$; eating some foods that you did not want because of a lack of resources $r=0.176$, $p=0.003$; eating a smaller meal than you felt you needed because there was not enough food $r=0.155$, $p=0.011$; eating fewer meals in a day because there was not enough food $r=0.173$, $p=0.004$ were positively associated with amount of cash transfer. These effects were significant at the probability of error less than 0.05 and therefore, could not have arose by chance.

According to Merttens et al. (2013), households benefiting from the Hunger Safety Net cash transfer increased their diet diversity and were ten percentage points less likely to fall into the poverty trap. Alamirew and Tsehay (2013) argue that households that experience lower income levels have a high likelihood of being food insecure. According to Rufo et al. (2022), small-scale farmers should be supported with social safety nets to practice resilient agri-food systems aiming at enhancing their food security. Households can also benefit from other household livelihood outcomes such as diversification of incomes, increased productive assets, improved access to health care, and investments in social capital networks.

3.6.2 Effect of the adequacy of cash transfer on food insecurity

Regression analysis was carried out to assess the effects of cash transfer adequacy on food insecurity. Results are summarized in Table 5.

The results indicated that the adequacy of cash transfers by the HSNP to the beneficiaries had some effects on three (3) indicators of food insecurity. Among the food insecurity indicators, eating fewer meals in a day because there was not enough food, $r=0.145$, $p=0.016$; no food to eat of any kind in your household because of lack of resources, $r=0.145$, $p=0.017$; sleeping at night hungry because there was not enough food, $r=0.138$, $p=0.027$.

Handa et al. (2018) point out that households valuing cash transfers from social assistance programmes stand a chance of diversifying their

livelihoods and increasing household income. Such diverse sources of income enable such households to reduce their prevalence of food insecurity. Further, Alamirew and Tsehay (2013), beneficiaries of social safety nets who engage in multiple livelihoods such as businesses, are less likely to be food insecure and improve their income hence, stand a high chance of graduating from a social safety net.

3.6.3 Effect of duration of the hunger safety net support on food insecurity

The study expected that the duration of the HSNP support would have some effect on food insecurity. Regression analysis was carried out to assess the effects of the duration of the HSNP on food insecurity, and results were summarized in Table 6.

The results indicate that the duration of the HSNP support had some effects on six (6) indicators of food insecurity; namely worry that your household would not have enough food, $r=0.141$, $p=0.018$; not able to eat preferred foods because of a lack of resources, $r=0.126$, $p=0.037$; eating a limited variety of foods due to a lack of resources, $r=0.156$, $p=0.010$; eating some foods that you did not want because of a lack of resources, $r=0.173$, $p=0.040$; and eating a smaller meal than needed because there was not enough food, $r=0.158$, $p=0.010$; eating fewer meals in a day because there was not enough food, $r=0.176$, $p=0.003$.

3.6.4 Effect of training on food insecurity

The study expected that the training of the beneficiaries by HSNP or its agents would have some effects on the food insecurity of the beneficiaries. Regression analysis assessing the effects of the training of the beneficiaries by HSNP or its agents on food insecurity generated the following outcomes in Table 7.

The results indicate that the training of the beneficiaries by the HSNP or its agents did not have any effect on all the indicators of food insecurity. R squared (R^2) remained zero on all the indicators. According to Devereux and Sabates-Wheeler (2015), people who benefit from training programmes and diversify their income-generating activities have a smooth transition from social assistance programmes to self-sustaining livelihoods. In their study, Matsuda et al. (2024) found that conditional cash transfer programmes are more effective when

Table 4. Simple linear regression on cash transfer amount and food insecurity indicators

Variables	B Coefficient	R	R-squared	F	P value
Worry that your household would not have enough food	0.000016*	0.145	0.021	5.713	0.0175
Not able to eat preferred foods because of a lack of resources	0.000012*	0.130	0.017	4.561	0.0336
Eat a limited variety of foods due to a lack of resources	0.000015*	0.152	0.023	6.539	0.0111
Eat some foods that you did not want because of a lack of resources	0.000017**	0.176	0.031	8.537	0.00378
eat a smaller meal than you felt you needed because there was not enough food	0.000016*	0.155	0.024	6.464	0.0116
Eat fewer meals in a day because there was not enough food	0.000018**	0.173	0.03	8.245	0.00441
No food to eat of any kind in your household because of lack of resources	0.000009	0.095	0.009	2.259	0.134
sleep at night hungry because there was not enough food	0.000002	0.000	0	0.126	0.723
go a whole day and night without eating anything because there was not enough food	0.000002	0.032	0.001	0.137	0.712

Notes. Each food insecurity item was measured on a 3-point Likert scale; ** p<0.01, * p<0.05

Table 5. Simple linear regression on cash transfer adequacy and food insecurity indicators

Variables	B Coefficient	R	R-squared	F	P value
Worry that your household would not have enough food	0.102	0.045	0.002	0.493	0.483
Not able to eat preferred foods because of a lack of resources	0.187	0.089	0.008	2.304	0.13
Eat a limited variety of foods due to a lack of resources	0.176	0.084	0.007	1.883	0.171
Eat some foods that you did not want because of a lack of resources	0.191	0.089	0.008	2.267	0.133
eat a smaller meal than you felt you needed because there was not enough food	0.235	0.105	0.011	3.039	0.0824
Eat fewer meals in a day because there was not enough food	0.315*	0.145	0.021	5.853	0.0162
No food to eat of any kind in your household because of lack of resources	0.310*	0.145	0.021	5.755	0.0171
sleep at night hungry because there was not enough food	0.294*	0.138	0.019	4.943	0.0271
go a whole day and night without eating anything because there was not enough food	0.205	0.095	0.009	2.077	0.151

Notes. Each food insecurity item was measured on a 3-point Likert scale ** p<0.01, * p<0.05

Table 6. Simple linear regression on duration of support and food insecurity indicators

Variables	B Coefficient	R	R-squared	F	P value
Worry that your household would not have enough food	0.041*	0.141	0.020	5.656	0.0181
Not able to eat preferred foods because of a lack of resources	0.032*	0.126	0.016	4.384	0.0372
Eat a limited variety of foods due to a lack of resources	0.040**	0.155	0.024	6.759	0.00984
Eat some foods that you did not want because of a lack of resources	0.045**	0.173	0.030	8.23	0.00444
Eat a smaller meal than you felt you needed because there was not enough food	0.043**	0.158	0.025	6.794	0.00966
Eat fewer meals in a day because there was not enough food	0.048**	0.176	0.031	8.638	0.00358
No food to eat of any kind in your household because of lack of resources	0.025	0.095	0.009	2.491	0.116
Sleep at night hungry because there was not enough food	0.005	0.000	0.00	0.0985	0.754
Go a whole day and night without eating anything because there was not enough food	0.007	0.032	0.001	0.205	0.651

Notes. Each food insecurity item was measured on a 3-point Likert scale; ** p<0.01, * p<0.05

Table 7. Simple linear regression on influence of training and food insecurity indicators

Variables	Coefficient	R	R-squared	F	P value
Worry that your household would not have enough food	0.038	0.000	0	0.0542	0.816
Not able to eat preferred foods because of a lack of resources	0.195	0.084	0.007	1.856	0.174
Eat a limited variety of foods due to a lack of resources	0.000	0.000	0	3.7306	0.998
Eat some foods that you did not want because of a lack of resources	0.194	0.084	0.007	1.783	0.183
eat a smaller meal than you felt you needed because there was not enough food	0.111	0.045	0.002	0.541	0.463
Eat fewer meals in a day because there was not enough food	0.120	0.045	0.002	0.642	0.424
No food to eat of any kind in your household because of lack of resources	0.132	0.055	0.003	0.776	0.379
sleep at night hungry because there was not enough food	-0.171	0.071	0.005	1.21	0.272
go a whole day and night without eating anything because there was not enough food	-0.019	0.000	0.000	0.0144	0.905

Notes. Each food insecurity item was measured on a 3-point Likert scale ** p<0.01, * p<0.05

there is the integration of financial literacy and livelihood enhancement training projects. The authors highlight that the rural population especially women stands to benefit from financial literacy and inclusion projects. Knowledge of financial management improves household decision-making and increases the chances of switching to profitable livelihoods.

3.6.5 Joint effects of hunger safety net support mechanisms on food insecurity and income change

Multiple linear regression analysis was done to examine the effect of the adequacy of the transfer amount, duration of HSNP support, training influence, and amount of HSNP funds on

Food Insecurity. The analysis was done with demographic covariates, including household size, gender, education level, age, and livelihoods (business, crop farming, casual labour, remittances, and livestock). The results are shown in Table 8.

Cash transfer adequacy was significantly associated with a lower likelihood of food insecurity $b=-0.101$, $p=0.042$. After controlling for covariates, the effect of the adequacy of fund transfer was still persistent, $b=-0.134$, $p=0.05$. Households whose main livelihood was business, $b=-0.171$, $p=0.007$, casual labour, $b=-0.119$, $p=0.036$, and remittances, $b=-0.140$, $p=0.039$ were significantly associated with a lower likelihood of food insecurity.

Table 8. Multiple linear regression on hunger safety net support mechanisms, demographics and food insecurity, and income change

Variables	(1)	(2)
	Food Insecurity	Income Change
Adequacy of fund transfer (Low)	-0.134* (0.050) 0.008	-20,040.385** (1,382.029) 0.000
Duration of HSNP support	- -	- -
Influenced by training	0.104 (0.061) 0.088	-2,163.557 (1,645.946) 0.190
Amount of HSNP Funds	0.000 (0.000) 0.399	-0.035 (0.070) 0.619
HHSIZE	0.047 (0.033) 0.150	-369.672 (897.727) 0.681
Female	-0.052 (0.042) 0.214	221.989 (1,150.505) 0.847
Education Level	-0.010 (0.033) 0.760	1,367.369 (892.296) 0.126
Business	-0.171** (0.063) 0.007	4,383.107* (1,725.376) 0.012
Crop farming	-0.059 (0.083) 0.480	-4,083.294 (2,323.858) 0.080
Casual labour	-0.119* (0.056) 0.036	-3,848.918* (1,536.269) 0.013
Remittances	-0.140* (0.067) 0.039	2,709.772 (1,836.544) 0.141
Livestock	-0.083 (0.055)	1,254.230 (1,518.865)

Variables	(1) Food Insecurity	(2) Income Change
Age (Years)	0.131 -0.002 (0.001) 0.214	0.410 35.830 (36.583) 0.328
Constant	1.078** (0.138)	21,135.811** (3,803.790)
Observations	0.000 319	0.000 330
Adjusted R-squared	0.033	0.450
F-Stat	1.902	23.47
Prob > F	0.0336	0

Respondents with perceived the adequacy of cash transfer to be low registered an average lower income change of Ksh 20,765.223 than those who perceived high, $b=-20,765.22$, $p<0.001$. After controlling for covariates, the effect of the adequacy of cash transfer was still persistent, $b=-20,040.39$, $p<0.001$. Households whose main livelihoods are business were the only significant aspect associated with increased average income change of Ksh 4,383.11 compared to other livelihoods, $b=4,383.11$, $p=0.012$. Findings suggest that profitable business adds to household incomes. Businesses might be more resilient or adaptable during economic fluctuations, allowing them to adjust prices and increase earnings. Households running businesses tend to get higher financial returns than more stable, fixed-income livelihoods like agriculture or casual labour.

4. CONCLUSION AND POLICY RECOMMENDATIONS

The Hunger Safety Net Programme implemented in Marsabit County, Kenya is very instrumental in addressing food insecurity. Despite the level of food insecurity remaining high, the findings show that the monthly cash transfer received from the Hunger Safety Net Programme cushions the households from the adverse effects of food insecurity. In spite of the Hunger Safety Net Programme cash transfers considered low by the majority of the respondents, it helped them in meeting some basic needs in the household as others ventured into businesses. Household enrollment was primarily based on the prevalence of food insecurity, low-income, and vulnerable groups such as the elderly and persons living with disability in the household. The findings further indicate that the cash transfer amount, adequacy of cash transfer, duration of support, and livelihoods had statistically significant effects on household food

insecurity. The essence of providing the Hunger Safety Net support mechanisms was to improve the socio-economic well-being of beneficiaries through enhanced food security.

To achieve food security in drylands and especially in Marsabit County Kenya, there is a need to continue integrating social safety nets in various forms. However, the beneficiaries should be informed that the social safety net support is short-term, hence the need to manage the funds prudently. Other than monthly cash transfers, the beneficiaries should be given conditional seed capital to start income-generating activities. Due to harsh environmental conditions in most of the areas in Marsabit County, households should also be trained on climate-smart agriculture leveraging local indigenous knowledge and cultural practices. Lastly, for sustainable food security to be achieved, households should be encouraged to diversify their sources of income by investing in education and businesses.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Authors hereby declare that NO generative AI technologies such as Large Language Model (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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