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Dominant factors on food coping mechanism of poor households in Pringsewu Regency, Indonesia

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ABSTRACT

Introduction: In general, poor households do not have sufficient purchasing power to ensure food security, and this has led to the establishment of food coping mechanisms to alleviate this insufficiency. Therefore, this study was aimed at identifying the dominant factors on food coping mechanism of poor households. **Methods**: Simple random sampling technique and random tables were used to obtain the data from a sample size of 92 beneficiaries of poor targeted households of prosperous rice (RASTRA) in Pringsewu Regency through interviews and a questionnaire. Four villages, i.e., Fajar Baru, Kemilin of North Pagelaran Sub-District, Wargomulyo, and Tanjung Rusia of Pardasuka Sub-District, were the locations of the study. Data were analysed using descriptive and factor analysis. **Results:** Results showed that most households had food coping mechanisms involving buying smaller amounts and cheaper types of foods. Factors forming the poor households' food coping mechanisms were the households' social and economic conditions, food coping activities, assets, and heads' and their wives' occupations. **Conclusion**: In Pringsewu Regency, the dominant factor affecting food coping mechanism was social condition. This condition encompassed the household head's age, his and his wife's length of formal education, their nutrition knowledge, and the number of actors on food coping mechanism. Education was the dominant variable on food coping mechanism of poor households and it played the biggest role in affecting the establishment of survival mechanisms for overcoming food insecurity.

Keywords: dominant factor, food coping, RASTRA

INTRODUCTION

Poverty and starvation are some of the most basic humanitarian problems. In 2015, the Food and Agriculture Organization (FAO) reported that starvation affected 795 million people worldwide (720-811 million people in the world faced starvation in 2020); 780 million of whom lived in developing countries, including Indonesia (FAO, IFAD & WFP 2015; Glazebrook, Noll & Opoku, 2020). This led to the Sustainable Development Goals (SDGs), intended to overcome starvation. SDGs is a sustainable development agenda agreed by various countries of the United

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Nations (UN) based on human rights and equality for the promotion of social, economic, and environmental aspects.

The global agenda proposed by SDGs for overcoming poverty and starvation is similar to the national priority of human growth in the Medium-Term Development Plan 2015-2019 (RPJMN) and Nawacita Programme (President's programme) in Indonesia. According to the Food Act Number 12, 2012, the state is mandated to provide the population's food requirements under Human Rights (HAM). As a basic necessity and strategic commodity, food plays an essential role in making sure humans survive with healthy and productive lives.

One of the Indonesian government's efforts to tackle starvation and food insecurity issues is the food security programme. According to the decree of the Ministry of Agriculture No. 14/ Permentan/Ot.140/3/2012, the food security programme is regarded as a national development priority. The ministry developed the BULOG (Logistic Affairs Agency) as a State-Owned Enterprise (BUMN) tasked with supporting the food affordability sub-system through the supply and distribution of subsidised rice to the poor. It is known as the Prosperous Rice Programme (RASTRA), a food subsidy programme aiming to minimise the expenditure of the target households by fulfilling some of their basic food needs (rice) and preventing any decrease in energy and protein consumption. This has positively contributed to the people of the class by opening economic and physical accesses to foods, preventing malnutrition and providing energy, as well as protein (BULOG, 2014). The provision of RASTRA is based on the fact that food expenditure is dominated by rice, hence the poor are very vulnerable to the inability to afford rice as a result of the rise in its prices. The Indonesian government therefore seeks to provide sufficient food for poor households through RASTRA by distributing 15 kilograms to each household monthly.

Food insufficiency is a threat to the households' food security and nutritional status. One of the major factors of food security is household income. Household income is related to a household's poverty level (Grobler & Dunga, 2017), which can result in low purchasing power (Yousaf *et al.,* 2018). Therefore, the poor make various efforts to provide sufficient food for their household members. Besides RASTRA, households also carry out food coping mechanisms to handle food shortages and economic limitations (Anggrayni, Andrias & Adriani, 2015). This process is performed when the difficulty in fulfilling food needs emerges or due to the lack of capability to meet consumption needs for all members (Ume, Ci & Gbughemobi, 2018). Food insecurity is a factor driving households to take on food coping mechanisms.

According to Abdulla (2015), every household's food coping mechanism depends on the situation of food shortage and their ability to deal with it. Negash *et al.* (2015) stated that households with unemployment and unstable income problems have better coping mechanisms. The higher the food insecurity rate, the greater the coping mechanism taken on by the household (Grobler & Dunga 2017). Furthermore, regions with better food security have adaptive coping mechanisms (Ghimire, 2014). Therefore, food-insecure households' characteristics play a vital role in their coping mechanism (household socio-demography) (Alam, 2017).

One of the Food Development Goals is the realisation of food security at the household level and Lampung Province is one of the areas classified as a food-secured region. Regionally, Pringsewu Regency is one of the regions of Lampung Province with a surplus of rice, but has

malnutrition cases involving children under five years old. In the availability aspect, Pringsewu Regency has a surplus of 48,116 tons of rice and also corn and cassavas as sources of carbohydrates (Badan Ketahanan Pangan (BKP) Pringsewu or Food Security Agency, 2015[a]). However, regional food security does not guarantee household and individual food security (Suhaimi, 2019). There are still high rates of food insecurity among households, which indirectly affects children's overall nutritional status. Based on published data, the number of under-five-year-old children suffering from malnutrition in Pringsewu Regency during 2012-2015 was 26. This number increased by 80 percent from 2014 to 2015 (BKP Pringsewu, 2015[b]). Malnutrition is closely related to poverty. Pringsewu Regency's poverty line is at IDR 408.174/capita/month or 11.50% of the population in 2018 (BPS Pringsewu, 2021). The number of poor and food-insecure citizens in Pringsewu Regency was 45,580 in 2015. This number increased by 20.7 percent from 2014 to 2015 (BAPPEDA Pringsewu, 2016). This shows that Pringsewu Regency still faces chronic food insecurity due to poverty caused by unequal income distribution and monthly expenditure per capita as a result of the population's inability to handle food expenditure. Despite having a surplus, the presence of cases associated with malnutrition still indicates food security problems. One crucial problem is low access to foods, which led to the establishment of the RASTRA programme.

This study identified the food coping mechanisms of RASTRA-recipient households and determined how they were carried out. It also provided recommendations regarding developing and formulating appropriate policies to solve food insecurity issues through the understanding of the strategies adopted by these poor households.

MATERIAL AND METHODS

Locations and research time

This study was conducted in Pringsewu Regency using the survey method, and the location was determined purposively. There are nine districts in Pringsewu Regency. Pardasuka and North Pagelaran Sub-District were selected as the study locations based on poverty and composite indicators on the Food Security and Vulnerability Atlas (FSVA) [BKP Pringsewu, 2015[b]]. These indicators were used to choose locations with populations below the poverty line as the first priority. In terms of composite index, food insecurity in an area is caused by indicators such as availability, access, and nutrition utilisation. The availability indicator is based on the normative consumption ratio of net availability per capita per day. The access indicator is based on the poverty line, proportion of expenditure, and access to electricity. The nutrition utilisation indicator is based on the length of schooling for girls, access to clean water, ratio of the population per health workers to level population density, prevalence of stunting for toddlers, and life expectancy at birth (BKP of Ministry of Agricuture, 2018). The selected areas were characterised by the food insecurity status and a composite index value of 3 in December 2015. This composite index value indicated that Pardasuka and North Pagelaran Sub-districts fell into the category of first-degree food insecurity. Four villages, namely Fajar Baru, Kemilin in North Pagelaran Sub-District, Tanjung Rusia, and Wargomulyo in Pardasuka Sub-district, were chosen as the study locations as they had the largest numbers of RASTRA beneficiaries. The data were collected from July to August 2018.

Sampling technique

The population was 1,132 poor

households receiving RASTRA in 2015. However, the number of households as valid sample units determined based on Slovin's formula with an estimated error rate of 10 percent was 92 (Siregar, 2016). The number of sample units involved in this study was estimated using the formula below:

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

n : the number of sample units
N : total population (1,132 poor households)
e : margin of error (0.1 atau 10%)

The minimum acceptable sample size based on the correlational descriptive methods using statistical data analysis was 30 (Louangrath, 2017). So, the number of sample units in this study was acceptable. In addition, the number of sample units was considered large enough for factor analysis and validated reliability. For each village, the number was determined proportionally, and the number of sample units in Fajar Baru Village, Kemilin, Tanjung Rusia, and Wargomulyo were 13, 19, 26, and 34 households, respectively. The different households were selected using simple random sampling technique by random-table.

Data collection and data analysis techniques

Primary and secondary data were employed in this study. The primary data were obtained through direct observation and interviews using a structured questionnaire adapted from Usfar (2002). The items of the questionnaire included the characteristics of poor households (age, gender, education, number of family members, nutrition knowledge, job, income), food expenditure, assets, amount of rice availability, and food coping strategy activities (types of activities, frequencies, and actors). The secondary data were collected from agencies or institutions related to the study, such as data on the number of poor households receiving RASTRA, Food Security Vulnerability Atlas (FSVA), undernutrition, food availability, and expenditure of the population in Pringsewu Regency. Then, the descriptive-analytical method was applied to determine the households' food coping mechanisms based on the types of activities, frequencies, and actors (Negash *et al.,* 2015).

The food coping mechanisms conducted by each household depended on the food problems faced. All types of food coping activities indicated the existence of household food insecurity problems, but they did not necessarily determine the same level of severity. Therefore, the greater the food insecurity, the more significant the mechanism. Behaviours were grouped into three categories and assigned a scale value. Scale 1 included actions to increase income, change eating habits, and increase immediate access to foods. Scale 2 included measures to increase immediate access to foods, change distribution and frequency, and go through days without eating. In contrast, scale 3 was a drastic step, such as migration, giving children to relatives, and divorcing. The larger the scale, the more severe the food problems faced that increased the use of food coping mechanisms. The severity of food coping mechanisms can also be affected by the socio-demographic characteristics of the households.

This study applied quantitative descriptive analysis for the food coping mechanisms undertaken by poor households and factor analysis composing of the Principal Component Analysis (PCA) extraction model to figure out the dominant factors of food coping mechanisms based on the socio-demographic characteristics

of households. Household socio-demographic variables with a strong correlation were included in the factor analysis and variables with a weak correlation were excluded from the factor analysis. If one or several initial variables individually had a Measure of Sampling Adequacy (MSA) value of lower than 0.5, then the variable was removed from the analysis process; so, it was necessary to repeat the analysis until all variables had a MSA value of higher than 0.5. The next step was to test the adequacy of the sample through the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy. If the KMO value was between 0.5 and 1, it was concluded that the appropriate factor analysis had been used. Bartlett's Test of Sphericity was used to determine the significant correlations between variables. Then, the eigen value showed the total variance that could be explained by each factor. Extracting the factors required looking at an eigen value greater than or equal to 1.0 (Santosa, 2012).

Ethical approval

This study was conducted under the approval of the Ethics Committee of the Institute of Research and Community Service, University of Lampung. All participants were informed of the purpose of the study and gave their written consent for voluntary participation.

RESULTS AND DISCUSSION

Characteristics of poor households

The food coping mechanism behaviour performed by each household was different and depended on their finance. Besides, socio-economic factors also affected various alternatives chosen by the households as survival mechanisms, and these characteristics significantly affected their access to food requirements. The results of the research showed that majority of the household heads and their wives were 52-60 and 45-51 years old, respectively. Thirteen widows received RASTRA assistance and became household heads. The prioritised recipients were generally old widows based on the results of the village head's meetings with officials. The lowest level of formal education among most household heads and their wives was elementary school, with homemakers' low nutrition knowledge.

Household income dominantly ranged from Rp. 1,000,000.00 to Rp. 1,500,000.00 per month (about 63,80 US – 95,71 US per month) with 3-4 home members. The types of occupation of the household heads were divided into the following fields: a) on-farm, b) off-farm, and c) non-farm. The heads worked as landowners or farmers (44.6 percent), farm labourers (29.4 percent), traders, construction workers, and drivers (26.1 percent).

Most of the household heads in Pardasuka Sub-District were farmers and farm labourers. About 34.8 percent of household heads had side jobs and the majority worked as artisans, in addition to 30 percent of homemakers. An average of Rp. 561,639.00/month (about 35,83 US per month) was spent on food stuffs such as grains, animal foods, vegetables, and beans.

Poor households' coping mechanisms

Every food coping mechanism behaviour indicated a problem of household food insecurity, but it did not necessarily determine the severity. Therefore, each behaviour was grouped and given a scale value (scale values of 1, 2, and 3). Results showed that all households or respondents carried out food coping mechanisms with scale values of 1 and 2. The former was massively carried out by the households. According to Martianto (2006), actions with scale values of 1 and 2 are household adaptation stages for conducting food coping mechanisms.

The adaptation phase is initiated when household food insecurity is at low and moderate levels, and this stage is related to changing habits on obtaining and consuming foods. It happens at the early stage of the coping strategy.

The households undertook an average of seven food coping mechanisms with a scale value of 1. They were reducing the amount of foods consumed, buying cheaper foods, collecting wild foods, growing edible plants in their gardens or near their houses, changing the priorities on foods, and looking for side jobs. Besides mechanisms with the scale value of 1, the households also took on food coping mechanisms with a scale value of 2. They performed about four food coping mechanisms with this value, which were owing food stalls some money for what they took, taking money from their savings, changing food distribution, and borrowing money from relatives. Each food coping mechanism conducted by the households had a different period and frequency. The results also showed that 97.83 percent carried out food coping mechanisms with scale values of 1 and 2. Those performing mechanisms with scale values of 1, 2, and 3 simultaneously were only 2.2 percent. Food coping mechanisms with a scale value of 3 was migrating out of the island to get jobs due to limited number of jobs and low salaries in their places.

Figure 1 shows that two food coping mechanisms with a scale value of 1, which were buying cheaper foods and reducing the amount and variety of foods consumed, were applied to satisfy all households. For example, fish or chicken was replaced by *tempeh* and tofu, which prices were much lower. The number of households consuming rice with fish, chicken or others, and vegetables shrunk; they changed their menu to rice and vegetables only. Sometimes, some households consumed cassavas instead of rice. These two food coping mechanisms were carried out 2 times a week for a longer period, in line with Maxwell and Caldwell's (2008) study. The first step to overcoming food consumption undertaken by food-insecure households was to change their diet, whereby households were likely to divert food consumption from preferred to cheaper substitutes.

Another food coping mechanism conducted by majority of the households was obtaining wild leaves from the edges of rice fields and gardens for consumption. The wild leaves were taro leaves, cassava leaves, sintrong leaves

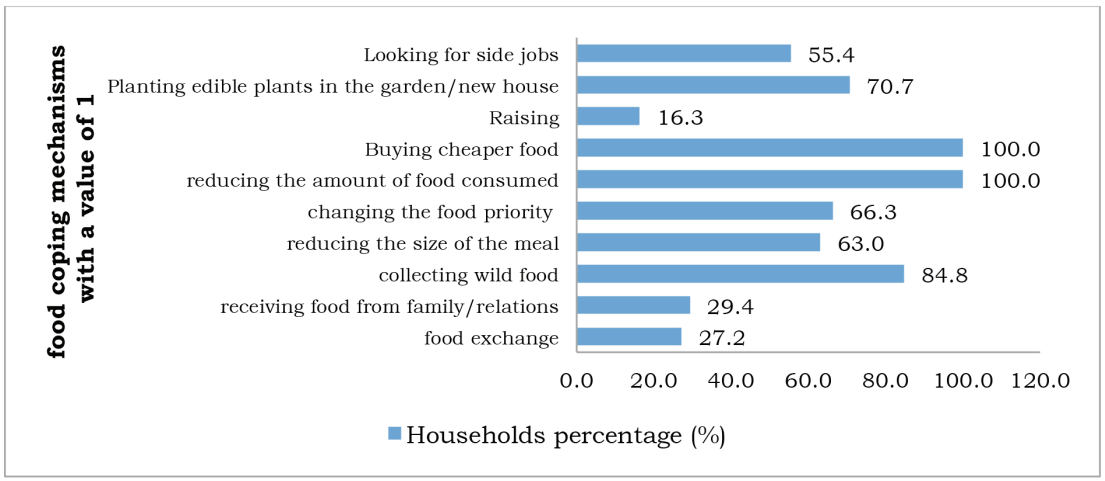

Figure 1. Percentages of household food coping mechanisms with a value of 1

(*gynura crepidioides*) etc. Approximately 70.7 percent of the households had gardens or yards for gardening, such as growing vegetables and tubers, like spinach, water spinach, tomatoes, chilli, eggplants, and cassavas. This action was consistent with the Sustainable Food Home Area Programme in Indonesia, known as *Kawasan Rumah Pangan Lestari* (KRPL), promoted by the Food Security Agency. The utilisation of a yard as a source of fulfilment of household food availability reduces food expenditure, improves Desirable Dietary Pattern (DDP), and supports household food security, especially in food-insecure areas. KRPL activities were also conducted to support government programmes for handling stunting and vulnerable food-insecure areas, developing border areas, and alleviating poverty (BKP of Ministry of Agriculture, 2019).

The food coping mechanisms with a scale value of 2 were chosen by the households when efforts to address food unavailability have been entirely unresolved. The addition of access to buy foods, changes in the distribution and frequency of meals, such as going through days without eating, were mechanisms with this scale value, and the percentages are shown in Figure 2.

The most common food coping mechanism with this scale value performed by the housewives was to owe the stalls some money for food stuffs, and it was usually carried out 2-3 times per month. Other actions included using savings to buy foods and changing its distribution. Changes in food distribution were carried out to reduce the portions of food consumed by the household members. Mothers did this to their children. For example, a mother who used to eat two ladles of rice ate only one ladle of rice instead as a manifestation of her change in food distribution. Also, some had their meals after the other members have had theirs and eaten as much as they wanted.

The last mechanism with the scale value of 2 was to pawn assets to make purchases; and the types of assets owned by the households were non-productive and productive. Non-productive assets were usually in the forms of electronic equipment, vehicles, savings, jewellery, and household appliances; while the productive ones were houses, lands, livestock, and rice fields or fields. In this case, households in the study area

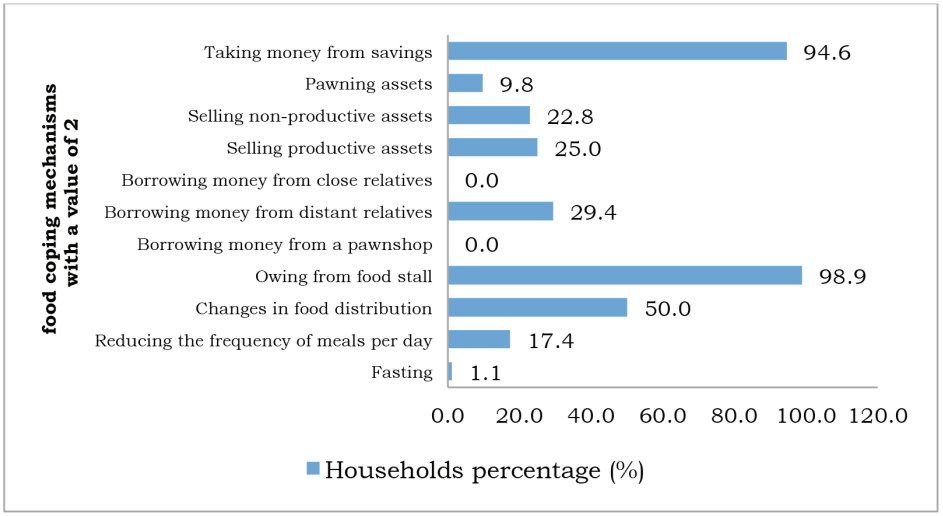

Figure 2. Percentages of household food coping mechanisms with a value of 2

tended to sell productive assets, such as livestock instead of non-productive ones. This was because the money from the sales of non-productive assets was significantly less and only met few needs. Furthermore, the lack of parties or traders willing to buy non-productive assets in the study area was another reason for why they preferred selling productive ones. Adepoju and Oyegoke (2018) stated that households with one form of asset or another had a higher likelihood of food security. Additionally, sales serves as a means of generating income to reduce food-related shocks. Farm households with access to credit are more likely to expand and diversify farming activities and buy inputs (Jabo *et al.,* 2017). Borrowing money for productive purposes is very important for farm households to increase their productivity.

The actors of the food coping mechanisms were household heads, housewives, and children. However, the study results showed that most food coping mechanisms were carried out by housewives, while homemakers played significant roles in almost all types of behaviours. They were the dominant actors of food coping mechanisms, especially those related to financial control. The households' decision-makers were the women because they managed resources to mitigate the short-term effects of not having enough food.

Dominant factors on food coping mechanism of poor households

The households performed food coping mechanisms due to the decrease or unavailability of foods, and their nature affected their access to the requirements. The factor analysis results showed two variables with an anti-image correlation value of lower than 0.5, namely the age of the housewives and the availability status of staple food (rice) (sufficient or less). According to Santosa (2012), when MSA variable value is less than 0.5, then it is unpredictable and unable to be further analysed. The correlation between variables of a factor should be strong enough, which is above 0.5. The variables of the homemaker's age and food availability status did not meet the statistical requirements. So, they were reduced and retested.

Results showed that the housewives undertook almost all the food coping mechanisms, and their age had no effect on the mechanisms because both young and old housewives carried out the process. Besides, they were not affected by the food availability status because majority had enough supplies due to the numerous ways of getting staple food (rice), such as the government's assistance (RASTRA), buying it from stalls, produce, and gifts from relatives. A household was classified as less efficient if they sold rice from the government to meet non-food needs, such as paying for electricity, settling debts, and buying various stuffs to cook, like vegetables and raw food materials.

The secondary analysis consisted of 19 variables with anti-image correlation values greater than 0.5, which allowed for further analysis. The KMO-MSA value was 0.67 and had a significance of 0.00 according to Bartlett's Test of Sphericity. This value indicated that the correlation between the variables and data can be a factor to analyse further, as shown in Table 1.

Table 1. Values of KMO and Bartlett's Test of Sphericity for food coping mechanism variables

Information	*Value*
Kaiser-Meyer-Olkin Measure of Sampling (KMO)	0.67
Bartlett's Test of Sphericity	658.42
Sig.	<0.001

Table 2. Eigen values and percentages of variance for six factors formed on food coping mechanisms of poor households

Factor	*Eigen value*	*Percentage of variance (%)*	*Cumulative variance (%)*
1	3.99	21.03	21.03
2	2.73	14.35	35.39
3	1.91	10.06	45.45
4	1.39	7.34	52.79
5	1.33	7.02	59.81
6	1.09	5.77	65.58

Six factors were formed with each an eigen value of greater than 1, with a total variance of 65.6. This value indicated that 65.6 percent of the poor households' food coping mechanisms were explained by these formed factors. Factor 1 contributed to 21.0 percent in forming the households' food coping mechanisms. The eigen values and variances for each factor are shown in Table 2.

Of the 19 analysed factors, six groups were formed, namely social conditions, food coping activities, economic conditions, assets, household head's occupation, and housewife's job. The dominant factor was social conditions, which included the age of the household heads, the length of their formal education along with the housewives, the nutrition knowledge of the housewives, and the number of actors involved in the food coping mechanisms with the scale value of 1. The factors determining the food coping mechanism of the poor households are shown in Table 3.

The length of household head's formal education had the highest loading factor value, 0.84. Loading factor is the correlation between a factor and a variable. The value indicated that the household head's length of formal education had a high correlation with the social condition factor in establishing the mechanisms to cope with mediocre food. The household heads' higher level of education resulted in the types of occupation and income leading to more purchasing power. The household heads' higher level of education helped them quickly understand new information, utilise available resources effectively and efficiently, and adopt innovations to improve food security (Boratynska & Huseynov, 2016). Therefore, the level of education increased the households' chance of becoming more food resistant without or with less coping mechanisms. This result is consistent with the study conducted by Onunka, Ihemezie & Olumba (2018), which found that the higher the education level of farmers, the less likely their ability to adopt several strategies to overcome food insecurity.

In the case of the dominant factor formed (factor 1), the housewife's formal education period was also part of the food coping mechanisms. A housewife's education affects her occupation and therefore her household income, as well as nutrition knowledge level. According to Damanik, Ekayanti & Hariyadi (2010), a wife's high education improves household welfare. Besides, high education also positively influences a homemaker's behaviour in managing the household, especially in the selection of daily foods, which accounts for all family members' nutritional status. A mother with higher nutrition education and knowledge enhances household food security and chooses appropriate food coping mechanisms, such as using yards for gardening and gathering

Table 3. Rotation values of factors on food coping mechanisms of poor households

No.	*Variable*	*Factor loading*	*Factor group*
1	Household head's age	-0.65	1 Social conditions
2	Formal education of household head	0.84	
3	Formal education of housewife	0.73	
4	Nutrition knowledge of housewife	0.58	
5	The number of actors involved in food coping mechanisms with a value of 1	-0.64	
6	Number of food coping mechanisms with a value of 1	0.65	2 Food coping activities
7	Number of food coping mechanisms with a value of 2	0.86	
8	Frequency of food coping mechanisms with a value of 1	0.63	
9	Frequency of food coping mechanisms with a value of 2	0.93	
10	Household food security status	-0.68	3 Economic conditions
11	The number of household members	0.71	
12	Income	0.55	
13	Food expenditure	0.65	
14	The number of actors involved in food coping mechanisms with a value of 2	0.54	
15	Assets	0.84	4 Assets
16	Quantity of rice for a week	0.76	
17	Household head's job	0.72	5 Household heads' job
18	Household head's side job	0.64	
19	Housewife's job	0.84	6 Housewives' job

edible wild plants to reduce expenditure and increase household consumption diversity.

The household heads were also one of the variables undertaking food coping mechanisms, with the majority within the age range of 52-60 years and older than 60 years of age. However, in their old age, they experience a decrease in endurance, health, and suffer various psychological stresses. Furthermore, their functions of organs and ability to work have reduced, which shrunk their income and food purchasing power.

A number of food coping actors undertook mechanisms that fell in the scale value of 1 in poor households. The mechanisms conducted by the households when food shortage occurred encompassed activities for increasing income, changing eating habits, and getting immediate access to foods. According to Gazuma (2018), activities generating income and food are negatively related to food insecurity. The food coping mechanisms with the scale value of 1 were done by 3 actors of the household members, while those with the scale values of 2 and 3 were done by 1-2 actors. The food coping mechanism actors were usually the father or husband, mother or wife, and children. More members were normally involved in the mechanisms to increase income, provide more opportunities for food availability, and overcome food

shortage. Maxwell and Caldwell's (2008) stated that the more people participated in overcoming food-related issues, the less food insecurity there was.

These findings implied that education is a determinant which affects the food coping mechanisms performed by both husbands and their wives in poor households. It also affects nutrition knowledge and types of occupation that, in turn, influence the income earned by the households. Besides food aid (RASTRA), poverty alleviation programmes involving increasing access to education in poor rural households are a viable solution to mitigate food insecurity.

CONCLUSION

In conclusion, strategies adopted by most households during the food shortage were to buy cheaper foods and to reduce the amount and variety consumed. The dominant factor affecting food coping mechanisms of poor households was social condition. This included the household head's age, length of formal education, as well as his wife's nutrition knowledge, and the number of actors in the mechanism. Formal education has the most significant influence on establishing a survival mechanism to overcome food insecurity at the household level.

Education had the highest correlation with food coping mechanism and was the primary variable adopted by poor households to overcome limited access. The government and other related parties should optimise formal and non-formal education variables, especially for housewives as the dominant actor of food coping mechanisms. With all that in mind, it is safe to infer that increasing public knowledge will enhance communal food security.

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Authors' contributions

WDS, principal investigator, conceptualised and designed the study, prepared the draft of the manuscript and reviewed the manuscript; WAZ, conducted the study, data analysis and interpretation; TSS, led the data collection; AM, assisted in drafting of the manuscript and reviewed the manuscript.

Conflict of interest

All authors have read, looked at, and agreed to the content of the manuscript and there is no financial interest to report. We certify that the submission is original work and is not under consideration for publication elsewhere.

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