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Food insecurity among students in University of Benghazi

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Abstract

Background: Because of their restricted financial resources, diminished purchasing power, and rising housing and food expenses, university students may be more susceptible to food insecurity [FI]. The purpose of this study was to evaluate university students' prevalence and severity of food insecurity.
Methods: A cross-sectional survey was designed, and data were collected using questionnaire and interview with the university students. Students from various academic levels made up the study population, and evaluations were conducted during the winter semester between January and February 2024. To establish the relationships between FI and sociodemographic factors, chi-square tests were employed. Additionally, bivariate logistic regression was employed to evaluate variables linked to FI.
Results: From the 300 participants, 52% of students were classified as food insecure, consisting of 32% with mild FI, 17.7% with moderate FI, and 8% with severe FI. FI was significantly associated with presence of household members that smoke every day [p = 0. 0.029, p=0.049, p=0.008], We used the Logistic Regression method to predict the regression which interpret that, the reduction of smokers by 84% will significantly contribute to achieving greater food security.
Conclusions: An understanding of the FI levels of university students at Benghazi university is given by this study Is found More than half of the students studied at the University of Benghazi were affected by food insecurity, with emphasis being given that the rate of cigarette consumption was more influential than other factors Future research is required to investigate solutions addressing food insecurity in this group and to employ objective indicators of food insecurity [food availability, access, and utilization]

Keywords: food insecurity, food security, university, student.

1. Introduction

Food insecurity refers to the lack of consistent access to enough food for an active, healthy life. It encompasses uncertainty about where the next meal will come from, inadequate quality or quantity of food, and the inability to afford nutritious options. According to the United States Department of Agriculture (USDA), "food insecurity is defined as a household-level economic and social condition of limited or uncertain access to adequate food."[1]

Furthermore, Food insecurity among university students refers to the lack of consistent access to nutritious and affordable food experienced by students pursuing higher education. This phenomenon is increasingly

recognized as a significant issue, with factors such as high tuition fees, limited financial aid, housing costs, and other expenses contributing to students' inability to afford sufficient food. Research indicates that food insecurity among university students can negatively impact academic performance, mental health, and overall well-being. Strategies such as campus food pantries, meal assistance programs, and financial aid adjustments are being implemented to address this issue and support students facing food insecurity [2]

Food insecurity has [significant impacts] on individuals, communities, and societies. Food insecurity often leads to inadequate intake of essential nutrients, resulting in malnutrition, especially among children and pregnant women [1]. Furthermore, Chronic food insecurity is linked to various health issues such as stunted growth, developmental delays, obesity, diabetes, and cardiovascular diseases, as were as, physical Health Problems Inadequate. nutrition can lead to health issues such as fatigue, weakened immune system, and poor overall health, which can further impact academic performance and overall well-being. [3,4] Moreover, Food insecurity imposes a significant economic burden on individuals and governments due to increased healthcare costs, decreased work productivity, and potential loss of income. [5]

In addition, academic performance decline among students facing food insecurity may struggle to concentrate in class, complete assignments, or study effectively due to hunger or worry about where their next meal will come from. [6] and higher dropout rates students experiencing food insecurity may be more likely to drop out of university due to the challenges they face in balancing academics with meeting basic needs. [7] Furthermore, Food insecurity can lead to stress, anxiety, and depression among affected individuals and families, impacting mental health and overall well-being. [8,9] Additionally, students may resort to taking on additional work or loans to afford food, which can exacerbate financial stress and impact their ability to focus on academic pursuits. [10] This study aimed to assess the prevalence and severity of FI and its associated factors among university students attending a public Benghazi university.

2. Methods:

2.1 Study design:

A cross-sectional study was designed to examine FI and its associated factors among the students in the university of Benghazi.

Data were collected using the Household Food Insecurity Access Scale [HFIAS] which assess the prevalence of household food insecurity [access component] and to detect changes in the food insecurity situation of a population over time. The HFIAS is composed of a set of nine questions that have been used and appear to distinguish food insecure from food secure households across different cultural contexts. The same form has been applied among several universities' cultures.

The study population included students from all levels of study [bachelor, master, and PhD, n = 334 but 34 students dropped out of the study as a result of not completing the questionnaire Assessments were conducted during the winter semester between January 2024 and February 2024.

2.2 Questionnaire

In crafting an interview schedule tailored to the study's objectives, a semi- structured pretested questionnaire was employed to engage with participants effectively. Prior to the commencement of the study, the questionnaire underwent pretesting with 10 students. This meticulous approach ensured that the questionnaire's efficacy and relevance were validated before its widespread implementation, enhancing the study's reliability and the depth of insights gathered.

The questionnaire had two parts: socioeconomic and demographic characterization; and the food insecurity scale (Household Food Insecurity Access Scale (HFIAS) Measurement Tool).

The first part of the questionnaire included questions related to socioeconomic characteristics as well as student and household demographics. This initial part of the questionnaire also included data indicating the nutritional status [weight and height] of the subject and issues related to household food consumption and behavior.

A digital scale and a stadiometer were used to measure body mass index (BMI). Zero error was verified. The study participant was asked to remove shoes and outer clothing. The study participant was asked to stand in the middle of the scale with feet slightly apart and remain still until the weight appeared on the screen. This weight was recorded. A stadiometer was used to measure height. They removed their shoes, socks and hair accessories

Body mass index (BMI) was calculated as weight (kg) divided by height (m2), and participants were classified according to World Health Organization BMI reference values, i.e., underweight, normal weight, overweight, and obesity.

In the second part, the methodology used to assess FI was a scale composed of 9 closed-ended questions (yes or no) referring to the last 4 weeks. All of the question items are related to the adult members of the household and under 18 years old.

The household’s FS was classified in 4 different categories:

1. Food Security (household members have regular and permanent access to quality food in sufficient quantity without compromising access to other essential needs).
2. Mild FI (household members report concern or uncertainty about access to food in the future or regarding inadequate food quality resulting from strategies that aim not to compromise the amount of food).

3. Moderate FI (household members report a reduction in the quantity of food among adults or disruption in eating patterns resulting from a lack of food among adults).
4. Severe FI (household members report a reduction in the quantity of food among under 18 members or disruption in eating patterns resulting from a lack of food among them; hungry—when someone stays a whole day without eating due to not having enough money to buy food)

The final score results from the sum of the affirmative answers and different cutting points were used.

Table 1. Household classification according to Food Security categories. [11]

Classification	Cutting Points
Food Security	0-1
Mild FI	2–7
Moderate FI	8–14
Severe FI	15–27

2.3 Ethics

all the participants provided informed consent from the dean of Benghazi University prior to completing the assessment procedures.

2.4 Statistical Analysis

Descriptive analysis was undertaken using IBM SPSS Statistics for Windows (version) to investigate the prevalence of FI and to summarize sociodemographic characteristics. A Pearson's chi-square test was used to determine the associations between FI and sociodemographic variables. Bivariate logistic regression was further used to assess factors associated with FI. Results were expressed as odds ratios with 95% confidence intervals (Cis). A p-value of <0.05 was considered statistically significant.

2.5 Limitations: The study has a number of drawbacks. First, we were unable to establish a causal link between the use of tobacco products and food insecurity because of the cross-sectional character of the study design. Given that there has been prior reporting of a bidirectional link between smoking and food insecurity, it would be significant to do longitudinal investigations on this correlation

3. Results and Discussion

A total of 334 students participated in the study. Figure 1 represents the FS status of the students where 52% of students had food insecure. Figure 2 represents the Prevalence of food security by category (%), showing that 42.3% of students were food secure32.0% were mildly food insecure, 17.7% were moderately food insecure, 8.0% of participants were severely food insecure

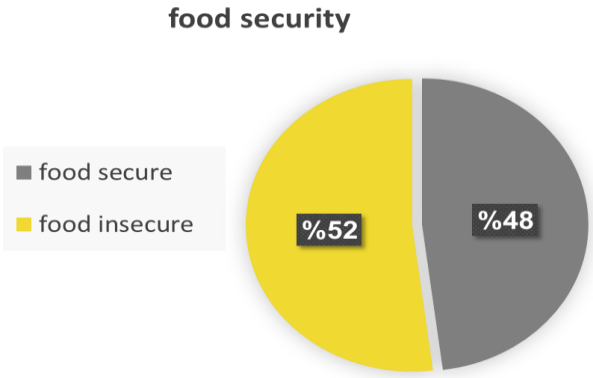

Figure 1 Food Security

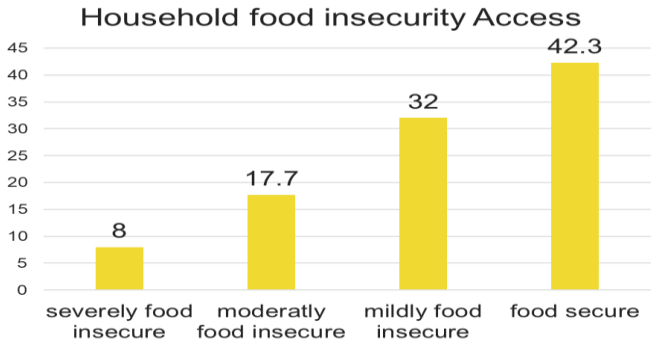

Figure 2 represent the prevalence of food security by category [%]

Total number of student sample were 300 participants. Most of the participants were female (95.3%), and above 18 years (92.0%). the results show that most of students were undergraduate and they were from Benghazi (95.3%). Additionally, more than half of the student's sample had normal body mass index (54.7%) participants who were either older than five or family members were the majority (88.0%). around 63.7% of the students reported having at least two persons and more of household member that were unemployed. about (67.0%) about 60.3% of households have smokers in their families.

Table 2: Socioeconomic and demographic characterization of the participants.

Demographic data			
Variables		**Frequency**	**Percent %**
Age	Less than 18 Y	24	8
	18 year and above	276	92
Gender	Male	14	4.7
	Female	286	95.3
Residence	Benghazi	286	95.3
	Another country	14	4.7
Education Level	Bachelor's	286	95.3
	Master's	6	2
	Ph. D	8	2.7
BMI	under weight	28	9.3
	normal weight	164	54.7
	over weight	67	22.3
	obesity	41	13.7
	Two persons	6	2

Number of family members	Three persons	6	2
	four persons	24	8
	five persons and more	264	88
Number of people over 65 years old	No one	198	66
	one person and more	102	34
Number of unemployed family members	Zero	46	15.3
	One person	63	21
	Two person and more	191	63.7
How many people contribute to the family income?	Two persons and less	201	67
	More Than Two persons	99	33
Are there smoking members in the family?	Yes	181	60.3
	No	117	39
	I don't know	2	0.7

The most affirmatively answered question related to the concern that did students or any household member have to eat a limited variety of foods due to a lack of resources with 46.3%. In the last four weeks before answering the questionnaire, 42.7% of the students also reported that household members had to not able to eat the kinds of foods they preferred because of a lack of resources. In addition, 39.0% of respondents were worry that your household would not have enough food (i.e see figures 3,4 and 5).

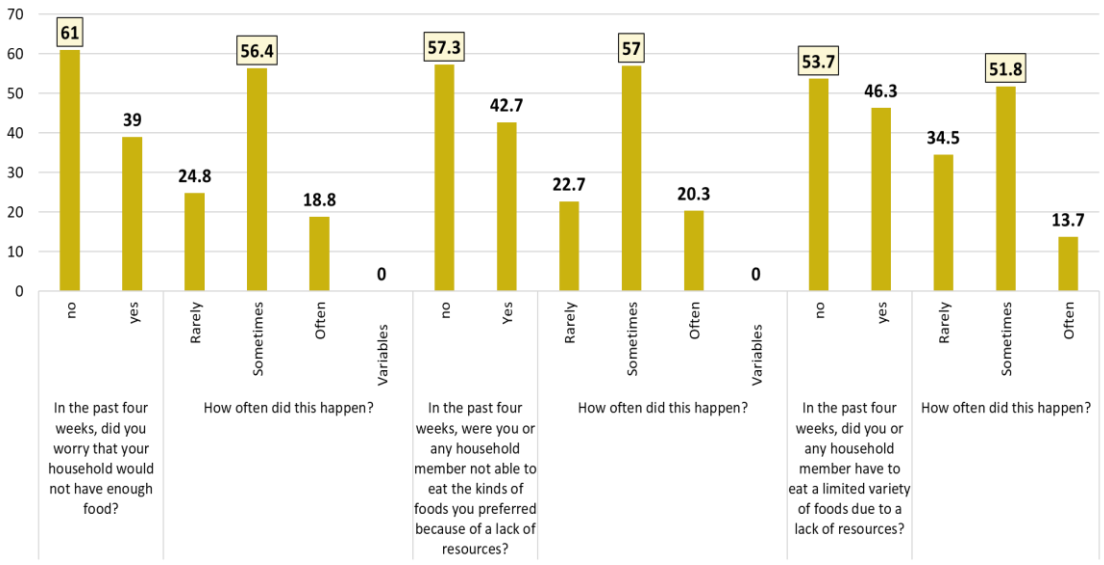

Figure 3 Percentage and frequency of answers provided by students for the food insecurity questions [HFIA]

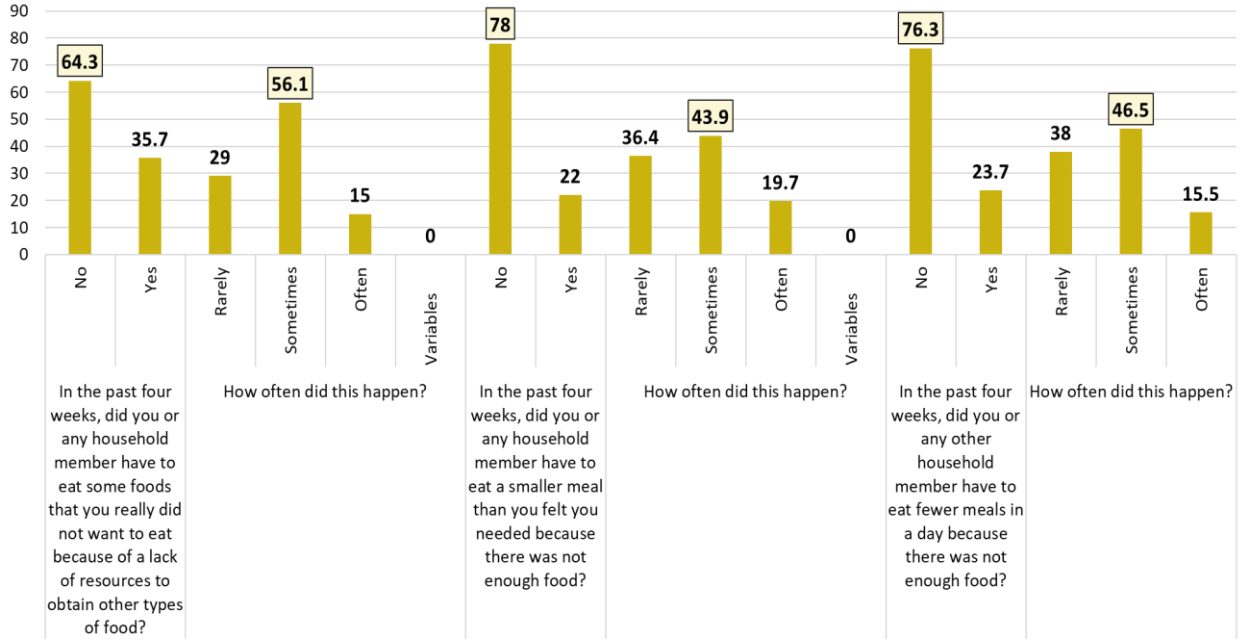

Figure 4 Contimouse to Percentage and frequency of answers provided by students for the food insecurity questions (HFIA).

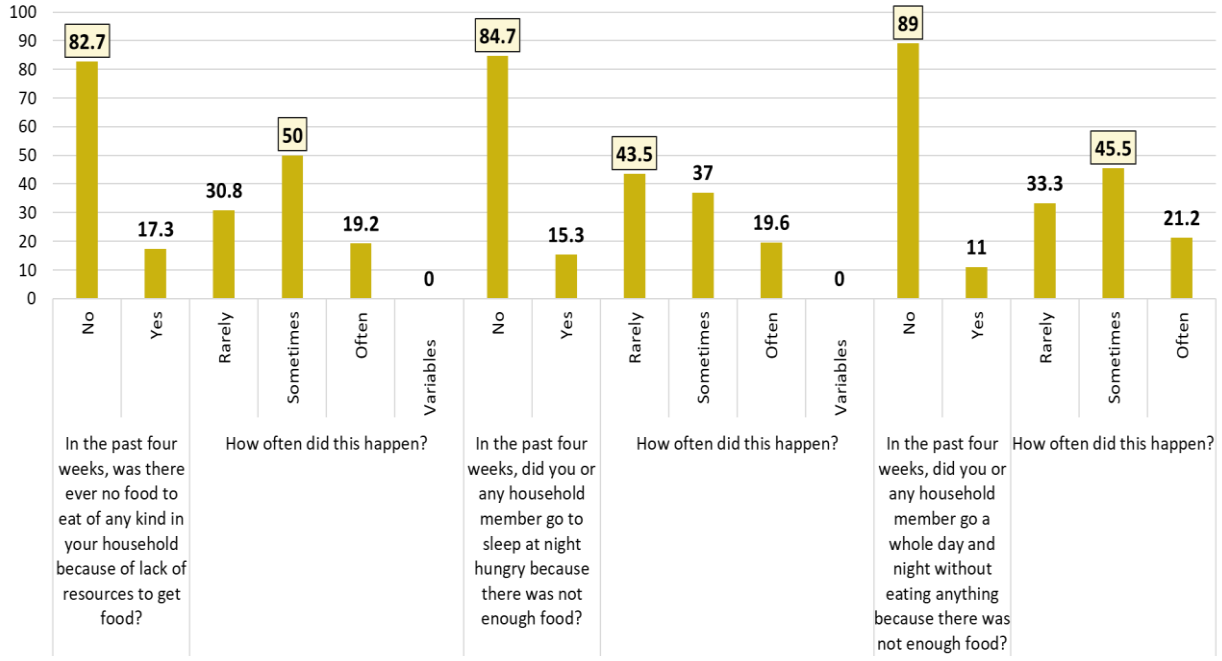

Figure 5 Continoues to Percentage and frequency of answers provided by students for the food insecurity questions (HFIA).

Using the Chi test to test whether there is a relationship between the independent variables (socio demographics) and dependent variables (HFIA questions). Table 4 shows the discovery of many relationships. While there were more than one important relationships, however, were between the most

significant values presence of household members that smoke every day and worry about household would not have enough food the Chi test value = 9.715, and the significance level, P-value = 0.008 which is a value less than 0.05, so there is a significant relationship between these variable, the other results have been listed in the table 3 below.

Table 3: Relationship between sociodemographic and dependents variables HFIA questions among insecure food students

Did you or any household member have to eat a limited variety of foods due to a lack of resources?	Pearson Chi-Square	P-value
number of household members	6.388	0.041
were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?	Pearson Chi-Square	P-value
number of household members contributing to family income	8.054	0.018
In the past four weeks, did you or any other household member have to eat fewer meals in a day because there was not enough food?	Pearson Chi-Square	P-value
number of household members contributing to family income	4.607	0.032
Did you or any household member go a whole day and night without eating anything because there was not enough food?	Pearson Chi-Square	P-value
number of household members contributing to family income	5.342	0.021
Did you worry that your household would not have enough food?	Pearson Chi-Square	P-value
Presence of household members that smoke every day	9.715	0.008
In the past four weeks, were you or any household member not able to eat the kinds of	Pearson Chi-Square	P-value
foods you preferred because of a lack of resources?		
Presence of household members that smoke every day	9.559	0.049
Did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?	Pearson Chi-Square	P-value
Presence of household members that smoke every day	7.082	0.029
In the past four weeks, have you or any member of your family been forced to eat limited types of foods due to lack of resources?	Pearson Chi-Square	P-value

Number of non- working family members	6.395	.041
Number of family members aged 65 years	Pearson Chi-Square	P-value
Have you or any member of your family gone to bed hungry at night because there was not enough food?	7.997	.005

used the Logistic Regression method to predict the regression equation that explains the depended variable (food security) with the five independent variables shown in the table. It became clear that the factor (presence of smokers in the family) contributes significantly to changes in the variable (food security) at the significance level of P-value = 0.000

$$y = 1.917 - 0.226x_1 + 0.434x_2 + 0.193x_3 + 0.450x_4 - 0.846x_5$$

This means the reduction of smokers by 84% will significantly contribute to achieving greater food security.

Table 4: Binary logistic regression results of food insecurity status in relation to five independent variables characteristics (n = 284).

Variables in the Equation	B	S.E.	df	Sig.
number of household members	-.226	.228	1	.322
number of household members ≥65 years old	.434	.263	1	.100
Number of unemployed family members	.193	.164	1	.240
number of household members contributing to family income	.450	.263	1	.087
Presence of household members that smoke every day	-.846	.241	1	.000
Constant	**1.917**	**1.109**	**1**	**.084**

Food insecurity (FI) has become an increasingly widespread issue, with 52% of university research participants—more than half—reporting experiences of FI. This finding aligns with existing evidence highlighting high levels of FI among college students. Similarly, a recent survey found that 60.9% of undergraduate students across four public universities in Peninsular Malaysia faced FI. Nurulhudha emphasized that including multiple institutions in the analysis strengthened the significance of the observed trend [12]. Furthermore, the finding from this study was the strong link between FI and the presence of daily smokers in households. Previous research has shown that smoking exacerbates financial strain by diverting funds from essential needs. For instance, while occasional tobacco use was not associated with FI, daily smoking significantly increased the risk of severe FI [13]. Long-term studies

further suggest that habitual smoking leads to heightened FI levels due to adverse health impacts and reduced work capacity [14-15]. Conversely, stress caused by FI can promote smoking behavior and create barriers to quitting [16] Nicotine, a primary component of tobacco, suppresses appetite, and smoking is sometimes used by individuals experiencing FI as a coping mechanism to manage hunger. Additionally, a strong correlation was observed between tobacco use, the number of items consumed, and FI severity categories [17].

Unemployment within households was another critical factor associated with FI, consistent with previous research linking job loss to household financial instability. Unemployment often results in income shocks and volatility, which negatively impact food consumption. Studies have shown that households with no employed members are significantly more likely to experience FI [18]. Larger families also face higher risks due to increased food needs and financial demands. However, this burden can be mitigated when other family members contribute to household income [19]. Poor families, in particular, are more vulnerable to FI than wealthier households, as noted by Nord and Hopwood [19].

Having more jobless family members was another factor linked to FI, which is in line with other studies that linked unemployment with household FI [20,21] It is often known that one of the biggest risk factors for household financial instability is unemployment or job loss. Food consumption in households is primarily impacted by unemployment through negative income shock and income instability. According to earlier research, the FI rate and the unemployment rate are related, and families with no working individuals have a higher likelihood of having FI [22]. In the current study, a significant association was found between food insecurity and number of family members aged 65 years and the result was similar to the study of Keenan et al 2001 on household aged 65 and older who indicated that they “sometimes” or “often” did not have enough to eat during the previous 30 days [23]. The high rate of FI as observed in our sample is reflective of the risk of inadequate food available to university students. This could in turn impact on their nutritional status and academic performance during their course of study in the university. Therefore, addressing FI among university students should be a major focus of stakeholders and policy makers in order to improve the educational attainment and social security of these students upon their graduation [24]. The present study suggests that university students appear to be a particularly vulnerable group at risk of FI, and that FI status appears to be related to their socioeconomic and demographic attributes. Given the scarcity of data, especially among European countries, further representative investigation of university students’ FI, health and social outcomes, and strategy responses is needed [24].

5. Conclusions:

Food insecurity is a complex and multifaceted issue that requires collaborative efforts at local, national, and global levels. Food insecurity is a pressing global issue affecting millions, with significant consequences for health, including malnutrition, weakened immune function, and greater vulnerability to diseases. It also worsens poverty, hinders economic progress, and reinforces cycles of inequality. At the University of Benghazi, over half of the students surveyed experienced food insecurity, with cigarette consumption identified as a more impactful factor compared to others. Future studies could explore targeted interventions to address food insecurity within this population. Universities have the potential to foster a supportive environment by implementing strategies that ensure students have access to the nutrition necessary for academic success and personal well-being. Addressing food insecurity demands a unified approach, including the implementation of enhanced agricultural techniques, improvements in food distribution systems, and the reinforcement of social safety programs. Addressing the root causes and adopting sustainable strategies is crucial to ensuring everyone has access to safe, sufficient, and nutritious food.

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