# CHAPTER – V

**Food Security Status of the Sample BPL Households and its Determinants**

## Introduction:

As the basic objective of the present study is to analyse the food security status of the sample BPL households of the Golaghat district of Assam, this chapter attempts to present the food security status of the sample BPL households. Here food security of the sample BPL households has been assessed with the help of food security index based on the acquisition of per capita calorie intake and food security based on Household Dietary Diversity Score (HDDS). Level of food security among both rural and urban sample BPL households has been scrutinized using both the indicators. Apart from that, food insecurity gaps, squared food insecurity gap, surplus index, severity level of food security of the sample BPL households have been also presented here. The present chapter is arranged in five sections.

Section I has been devoted to assess food security status of the sample BPL households in terms of per capita calorie intake. In section II, diversity of diet of the sample BPL households has been assessed. Comparison of the food security status of the sample BPL households with and without BPL card holders has been analysed in section III. Section IV explores the comparison of the food security status of the sample rural and urban BPL households. Section V has been devoted to finding out the various socio economic factors affecting the level of food security of the sample BPL households.

## V.I. Food Security Status of the Sample BPL Households Based on Per Capita Calorie Intake (PCCI) :

### V.1. (A) Rural Urban Wise Food Security Status Based on PCCI:

To access the state of food security, a food security index has been constructed on the basis of per capita calorie intake. The food security index which is constructed for the measurement of household food security of sample households depicts the following results given in the table and fig. Below:

**Table No –V.1**

**Rural Urban wise Food security status**

| | Food Secure | Food Insecure | Total |
|---|---|---|---|
| Rural | 101(25.25) | 299 (74.75) | 400(100) |
| Urban | 39 (39) | 61 (61) | 100 (100) |
| Total | 140 (28) | 360(72) | 500(100) |

Source: Tabulation from the primary data, 2014

(Figures in the bracket indicates percentage)

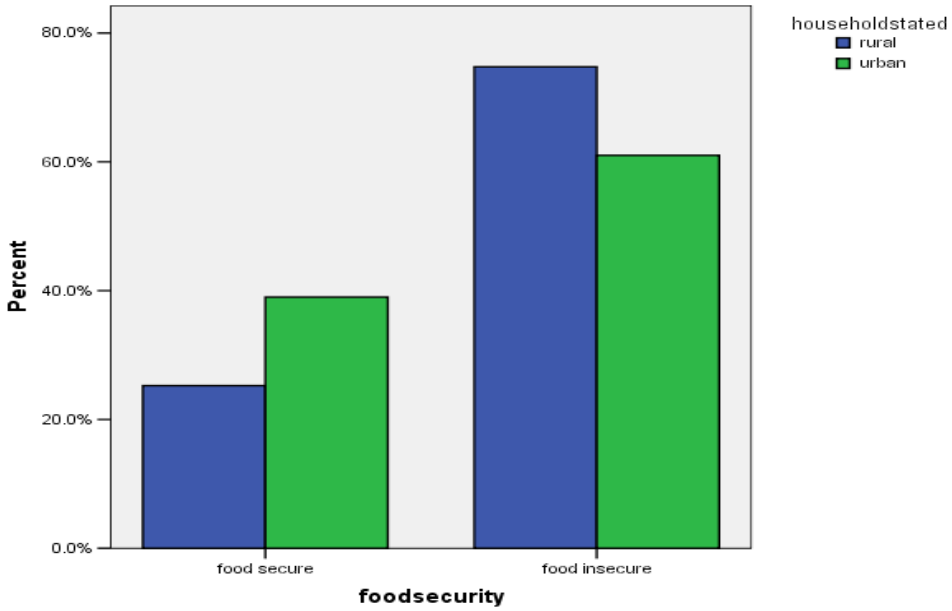


Fig.V.(1) Rural Urban wise food security status

Table V.(1) & fig. V (1) reveal that out of the 500 households only 140 households are food secure which is only 28 percent of the total sample households. This also reveals that 72 percent of the total sample households are food insecure.

In the rural area, out of 400 households, only 101 households (25.25%) are food secure and remaining 299 households (74.75%) are food insecure. In the urban area, this picture is slightly better where out of 100 households, 39 households (39%) are food secure and remaining 61 households (61%) households are foods insecure.

### V.1. (B) Block wise food security status:

Golaghat district has eight development blocks, viz. Morongi, Kakodunga, Gomariguri, Golaghat central, South Golaghat, East Golaghat, North Golaghat and West Golaghat. Table V (2) and Fig. V (2) depict the block wise food security status of sample BPL household

**Table No V.2:**

**Block wise Food security status**

| Block | Food Secure | Food Insecure | Total |
|---|---|---|---|
| Morongi | 14 (28) | 36(72) | 50 |
| Kakodunga | 20(40) | 30 (60) | 50 |
| Gamariguri | 7 (14) | 43(86) | 50 |
| Golaghat Central | 10 (20) | 40(80) | 50 |
| South Golaghat | 21 (23.33) | 6976.67) | 90 |
| East Golaghat | 25 (35.71) | 4564.29) | 70 |
| North Golaghat | 23(32.86) | 47(67.14) | 70 |
| West Golaghat | 20 (28.57) | 50(71.43) | 70 |
| Total | 140 (28) | 360(72) | 500 |

Source: Tabulation from primary data, 2014

(Figures in the bracket indicates percentage)

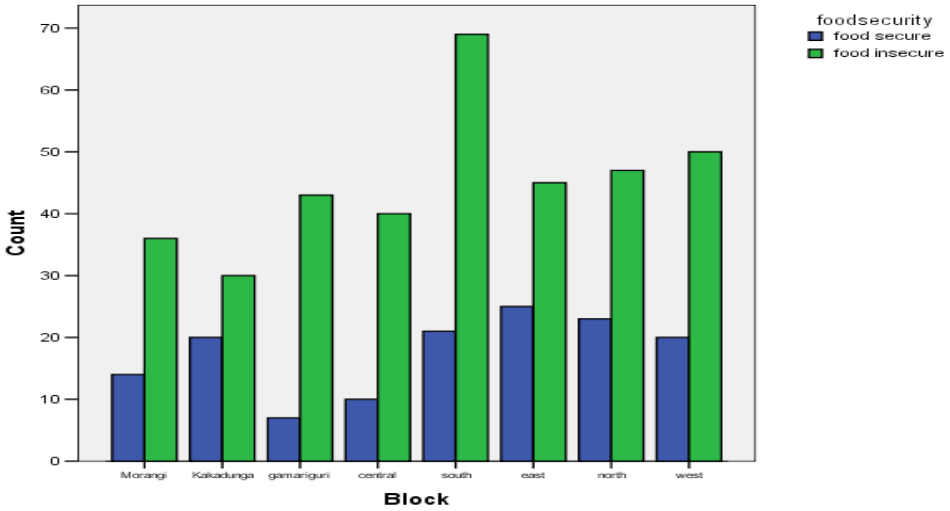


Fig. V (2) Block wise food security status of the sample households

Table V(2) & fig. V(2) indicate that 28 percent of the total sample households are food secure. Kakodunga block is the best performer in this regard where out of 50 sample households 20 (40%) households are food secured which is followed by the

East Golaghat block where out of 70 sample households, 25(35.71%) households are food secured. Food security status is worst in the Gomariguri development block where out of 50 nos. sample households only 7 (14%) of households are food secured. This situation is due to high concentration of ST population in the Gomariguri development block.

**V.1. (C) Food Security status of sample households having and not having BPL card:**

In the present study it is found that out of total 500 sample BPL households, only 297 (59.40%) households have BPL cards and rest of 203 (40.60%) BPL households have not got BPL card. As BPL card holders have got a decent amount of rice at a very rational price, the present study also analyses the difference of food security status between the households having BPL cards and not having the BPL cards depict in the table no. V(3) & fig. V (3):

**Table No: V.3**

**Food Security status of households having BPL cards**

| | Food Secure | Food Insecure | Total |
|---|---|---|---|
| Having BPL Card | 73 (24.58) | 224 (75.42) | 297 |
| Not having BPL card | 67 (33.01) | 136 (66.99) | 203 |
| Total | 140 (28) | 360(72) | 500 |

Source: Tabulation from the sample data, 2014

(Figures in the bracket indicates percentage)

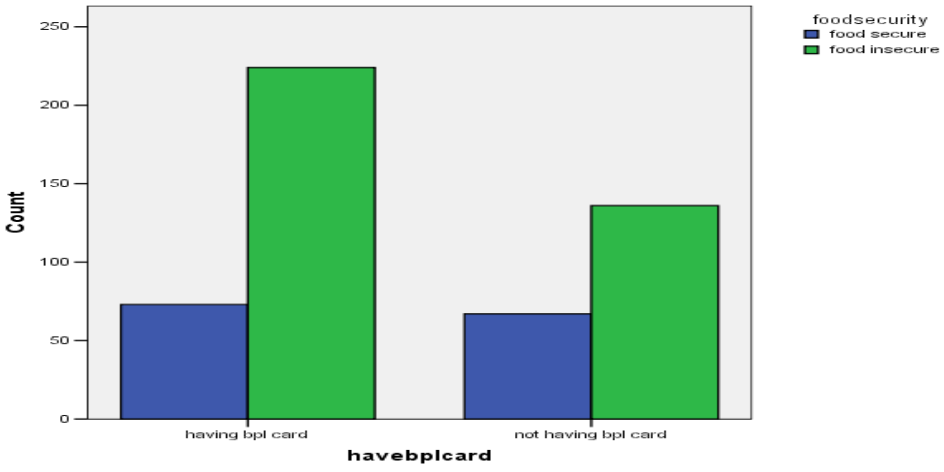


Fig.V (3): Level of food security having type of card

Table V(3) & fig. V(3) reveal that out of 297 BPL households who have BPL cards only 73 nos of households (24.58%) are food secured and remaining 224 no's households(75.42%) are food insecure. On the other hand out of 203 BPL households not having BPL card 67 nos of households (33.01%) are food secured and remaining 136 nos (66.99%) of households are food insecure. It reveals from the table that food security status of BPL households not having BPL card have better in percentage than the BPL households having the BPL card.

**V.1.(D) Analysis of food insecurity gap**

In the present study to measure the extent of insecurity gap, food insecurity gap of the households. Total (average) food security gap also known as shortfall index and squared food insecurity gap are estimated.

(i) **Food insecurity gap ($FIG_i$)** of $i^{th}$ food insecure households is defined as

$$FIG_i = \frac{(TCR_i - TCC_i)}{TCR_i} \qquad \text{(Guja, 2012)}$$

Where $TCR_i$ = Total per capita calorie requirement for $i^{th}$ food insecure household

$TCC_i$ = Total per capita calorie consumption by the $i^{th}$ food insecure household.

(ii) **Total Food Insecurity Gap (TFIG)** which indicates the depth of food insecurity among the food insecure households is expressed as

$$TFIG = \sum_{i=1}^{m} (FIG_i/m) \qquad \text{(Guja, 2012)}$$

Where

M=Total number of food insecure household

In the present study

$\Sigma FIG_i = 67.34$

M=360

TFIG= 67.34/360

=0.1871

=18.71 percent

(iii) **Squared food insecurity Gap (SFIG)** which indicates severity of food insecurity among the food insecure households is given as

$$SFIG=\sum_{i=1}^{m} (FIG_i)/m$$

In the present study

$\Sigma(FIGi) = 16.2144$

$m= 360$

$SFIG=16.2144/360$

$=0.04504$

$=4.50$ percent

(iv) **Surplus Index:**

In the present study to measure the extent of food surplus among the food secure household, surplus index has been constructed which is defined as

$$\text{Surplus Index} = \sum_{i=1}^{m} (FSG_i)/m$$

Where FSG= Food Security Gap and m= number of food secure household

. Here $\Sigma(FSGi) = 6.81$ and $m = 140$ hence surplus index = 4.86 percent.

**(v) Head Count Ratio:**

The head count ratio of the present study is (H= m/n) 0.72 which signifies that 72 percent sample BPL households are food insecure in the present study.

**V.1.(E) Severity level of food insecurity Analysis:**

The calorie intake shortfalls were estimated based on the nutritional reference level (2400 kcal/day/Adult for rural based people and 2100 kcal/day/Adult for urban based people). The calorie consumption estimates has been used directly to categorise the degree of food insecurity

On the basis of the level of measurement given in the methodology, it is found that out of the 500 sample BPL households, 140 households are food secured. 253 households are marginally food insecure, 96 households are moderately food insecure and 11 BPL households are severely food insecure in the present study which is explained in the table no. V(4) 7 fig. V(4).

**Table No.V.4**

**Rural /Urban wise households level of food security**

| AREA | Food Secured | Marginally Food Insecure | Moderately food Insecure | Severely Food Insecure | Total |
|---|---|---|---|---|---|
| Rural | 101(25.25) | 225(56.25) | 64(16.00) | 10 (2.50) | 400 |
| Urban | 39 (39.00) | 28(28.00) | 32 (32.00) | 1 (1.00) | 100 |
| Total | 140 (28.00) | 253(50.60) | 96 (19.20) | 11 (2.20) | 500 |

Source: Tabulation from primary data, 2014

(Figures in the bracket indicates percentage)

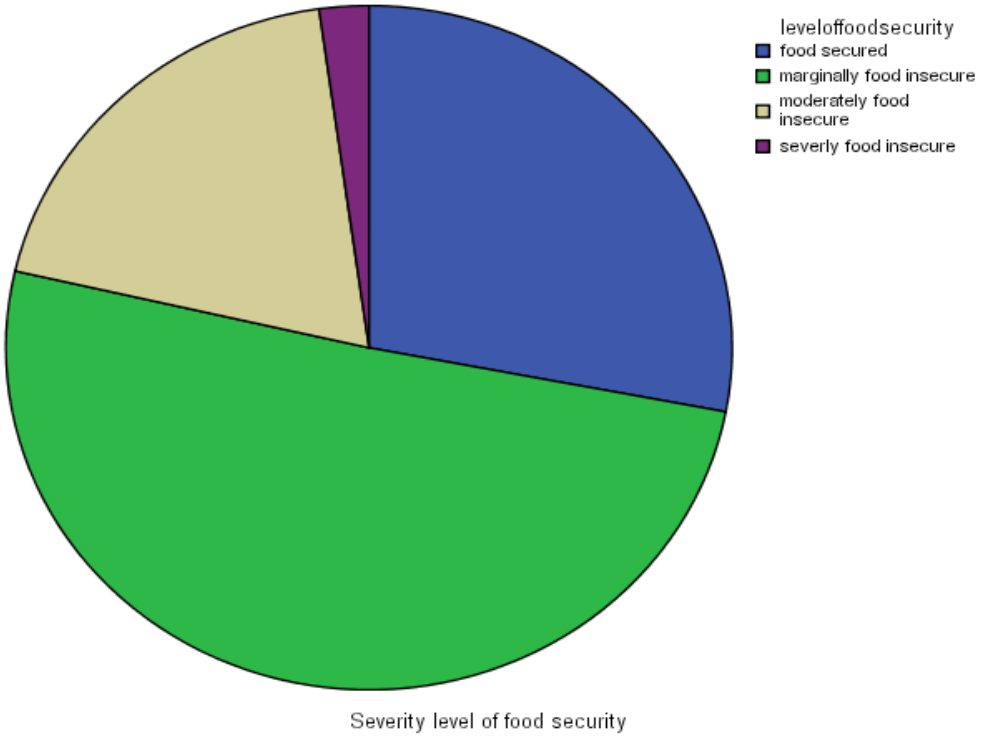


Fig. V(4): Severity level of the household food security

From the table no.V (4) & fig.V (4), it is revealed that out of the total sample BPL households maximum percentage (50.60) of households belong to marginally food insecure category. It is also found that 19.20 percent (96 no.) households are moderately food insecure and 2.2 percent (11 no.) households are severally food insecure.

In the rural area it is found that 56.25 percent (225 nos.) are marginally food insecure, 16 percent (64 nos.) are moderately food insecure and 2.50 percent (10 nos.) are severally food insecure. Out of the 400 sample rural BPL households 25.25 percent (101 nos.) have holds are food secured. On the other hand, in case of urban 28 percent are marginally food insecure, 32 percent are moderately food insecure and only 1 percent are severely food insecure. It also reveals that 39 percent urban households are food secured.

**Table no:V.5**

**Block wise level of Food Security**

| Block | Food Secure | Marginally Food Insecure | Moderately Food Insecure | Severely Food Insecure | Total |
|---|---|---|---|---|---|
| Morongi | 14 (28.00) | 35(70.00) | 1(2.00) | 0 | 50 |
| Kakodunga | 20 (40.00) | 29(58.00) | 1(2.00) | 0 | 50 |
| Gamariguri | 7(14.00) | 30(60.00) | 11(22.00) | 2(4.00) | 50 |
| Golaghat Central | 1020.00) | 33(66.00) | 5(10.00) | 2(4.00) | 50 |
| South Golaghat | 2123.33) | 29(32.22) | 37(41.11) | 3(3.33) | 90 |
| East Golaghat | 25(35.71) | 39(55.71) | 5(7.14) | 1(1.43) | 70 |
| North Golaghat | 23(32.86) | 34(48.57) | 12(17.14) | 1(1.43) | 70 |
| West Golaghat | 20(28.57) | 24(34.29) | 24(34.29) | 2(2.86) | 70 |
| Total | 140(28.00) | 253(50.60) | 96(19.20) | 11(2.20) | 500(100) |

Source: Tabulation from primary data, 2014

(Figures in the bracket indicates percentage)

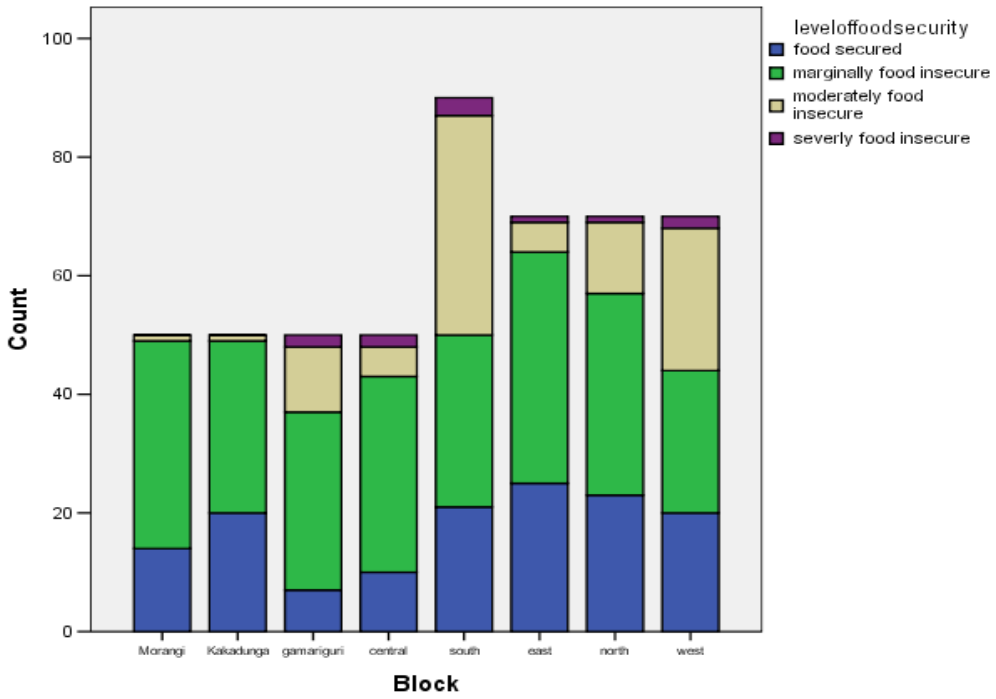


Fig. V (5): Block wise severity level of household food security

Table no. V (5) & fig. V (5) indicate the block wise level of food security of the sample population. The data indicate that Kakodunga block has the maximum percentage (40.00%) of food secure households followed by Golaghat East development block where 35.71 percentage of households are food secured. It is also found that food security scenario is worst in the Gomariguri development block where only 14 percent sample households are food secured. So far as the level of marginally food insecure is concerned, it is found that Morongi development block has the maximum percentage (70%) of marginally food insecure households. It is lowest in the Golaghat South development block where 32.22 percent sample households are marginally food insecure. Golaghat South development block has the maximum percentage (41.11%) of moderately food insecure sample households and it is lowest in Morongi and Kakodunga development block where only 2 percent households are moderately food insecure households.

## V.2. Food Security Status Based on Household Dietary Diversity Score (HDDS) of the Sample BPL Households:

Household Dietary Diversity Score, measured by summing up the number of food groups consumed over a reference period, is an important proxy indicator of food security as it is highly correlated with the factors such as calorie, protein and other food adequacy of the households. Babu and Sanyal (2009) in their study reveals that lack of dietary diversity is a severe problem among poor populations in the developing world because their diets are predominantly based on cereals and often include little or no animal products and vegetables. Dietary diversity is usually measured by summing up the number of food groups consumed over a reference period (Bazezew, 2012). This reference period may last 24 hours, last 3 days or last 7 days. Here 7 days recall method is applied as reference period. Eight food groups have been included here, these are- (i)cereal (ii) pulses (iii) vegetables and fruits (iv) milk and milk products (v) eggs/fish/meat (vi) root and tubers (vii) fats and oil seeds and (viii) miscellaneous. Findings of the various studies reveal that communities that depended more on cereals as source of food were more vulnerable to food insecurity than those with food diversified food sources (Tilaye 2008). According to Steyn (2006) cited in Bazezew (2012) dietary diversity score (DDS) below four is considered as nutritional inadequacy in the diets. The HDDS score variable has been computed for each household by summing up all the responses. Households which have the HDDS value greater or equal to 4 classified as ‘food secure’ household. The other group households have been termed as ‘food insecure’ with less than 4 HDDS score. Table no V(6) shows the block wise dietary diversity scores of the sample households.

**Table No:V.6**

**Block wise Household Dietary Diversity Scores**

| Block | HDDS Scores | | | | | Total |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | |
| Morongi | 0 | 7 (14) | 30 (60) | 13 (26) | 0 | 50 |
| Kakodunga | 4 (8) | 32 (64) | 12 (24) | 2 (4) | 0 | 50 |
| Gamariguri | 0 | 21 (42) | 27 (54) | 2 (4) | 0 | 50 |
| Golaghat Central | 1(2) | 16 (32) | 22 (44) | 10 (20) | 1 (2) | 50 |
| South Golaghat | 0 | 12 (13.33) | 65(72.22) | 10(11.11) | 3 (3.33) | 90 |
| East Golaghat | 0 | 17 (24.29) | 40(57.14) | 9 (12.86) | 4 (5.71) | 70 |
| North Golaghat | 0 | 21 (30) | 45(64.29) | 4 (5.71) | 0 | 70 |
| West Golaghat | 0 | 16(22.87) | 41(58.57) | 12(17.14) | 1 (1.42) | 70 |
| Total | 5 (1) | 142 (28.4) | 282(56.4) | 62 (12.4) | 9 (1.8) | 500 |

Source: Researchers own computation

(Figures in the bracket indicates percentage)

Table no:V(6) depicts that out of the 500 sample BPL households only 71 nos have the threshold level of HDDS above or equal to 4, out of which 9 households have HDDS 5 and remaining 61 households have HDDS 4. It also reveals that maximum households (282nos) HDDS score has been 3 which is 56.4 percent of the total sample BPL household. It shows that 5 and 142 nos households have the HDDS scores are 1 and 2 respectively.

So far as the block wise HDDS score is concerned, the HDDS score above or equal to the threshold level of 4 is maximum in Morongi development block where it is 26 percent (13nos) of the sample BPL households followed by Golaghat central development block with 22 percent (11 nos). The HDDS score of above or equal to 4 is minimum in Kakodunga and Gomariguri development blocks where only 4 percent (2 nos each) households have the HDDS score above or equal to 4.

Figure V (6) shows the mean, standard deviation and mode value of the HDDS of the sample households. It has been found that the mean HDDS of the sample area is 2.856 and the standard deviation and the mode are 0.70729 and 3 respectively. It

signifies the higher concentration of food insecure households in terms of HDDS score in the sample area.

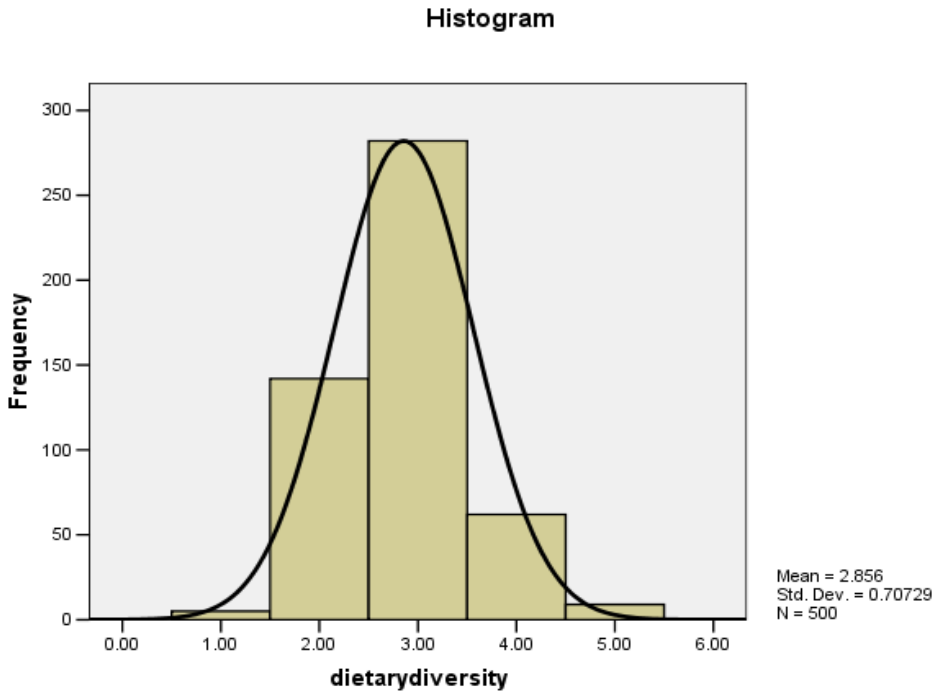


Fig V (6): Frequency distribution of HDDS of the sample households.

Rural urban wise HDDS score has been shown in the table no. V (7). It shows that in the rural area out of the 400 sample BPL households, 68 nos (17 percent) have HDDS score above or equal to the threshold level of 4, whereas in the urban area out of the 100 sample BPL households only 3 nos (3 percent) have HDDS score above or equal to the threshold level 4. It also reveals that in both rural and urban area maximum households HDDS score is 3. In the rural area 50.50 percent (202 nos) households HDDS score is 3 whereas in the urban area it is 80 percent (80 nos).

**Table No: V.7**

**Rural Urban Wise HDDS Score**

| | HDDS Scores | | | | | Total |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | |
| Rural | 5 (1.25) | 125(31.25) | 202(50.5) | 59(14.75) | 9 (2.25) | 400 (100) |
| Urban | 0 | 17 (17) | 80 (80) | 3 (3) | 0 | 100 (100) |
| Total | 5 (1) | 142 (28.4) | 282(56.4) | 62 (12.4) | 9 (1.8) | 500 (100) |

Source: Researchers own computation

(Figures in the bracket indicates percentage)

Food security of the sample BPL households has been calculated also by HDDS score by classifying the households HDDS score greater than or equal to 4 as food secure household and the households HDDS score less than 4 has been considered as food insecure household. Table no V(8) analyses the block wise food security status of the sample BPL households.

**Table no: V.8**

**Block Wise Food Security Status Based on HDDS**

| Block | Food Secure | Food Insecure | Total |
|---|---|---|---|
| Morongi | 13 (26) | 37 (74) | 50 |
| Kakodunga | 2 (4) | 48 (96) | 50 |
| Gamariguri | 2 (4) | 48 (96) | 50 |
| Golaghat Central | 11 (22) | 39 (78) | 50 |
| South Golaghat | 13 (14.44) | 77 (85.56) | 90 |
| East Golaghat | 13 (18.57) | 57 (81.43) | 70 |
| North Golaghat | 4 (5.71) | 66 (94.29) | 70 |
| West Golaghat | 13 (18.57) | 57 (81.43) | 70 |
| Total | 71 (14.2) | 429 (85.8) | 500 |

Source: Researchers own computation

(Figures in the bracket indicates percentage)

The table reveals that out of the 500 sample BPL households only 71 nos (14.2 percent) are food secure as per the threshold level of HDDS score and remaining 429 nos (85.8 percent) are food insecure. It also reveals that out of the eight development

block of the Golaghat district, in the Morongi development block has the maximum food secure household based on HDDS score with 26 percent of sample households (13 nos ) followed by Golaghat central development block with 22 percent sample households (11 nos). In the Kakodunga and Gomariguri development block only 4 percent (2 nos each) households have the required HDDS score which is an important criterion to be considered to become food secure household based on HDDS score. Figure V (7) depicts the fact diagrammatically.

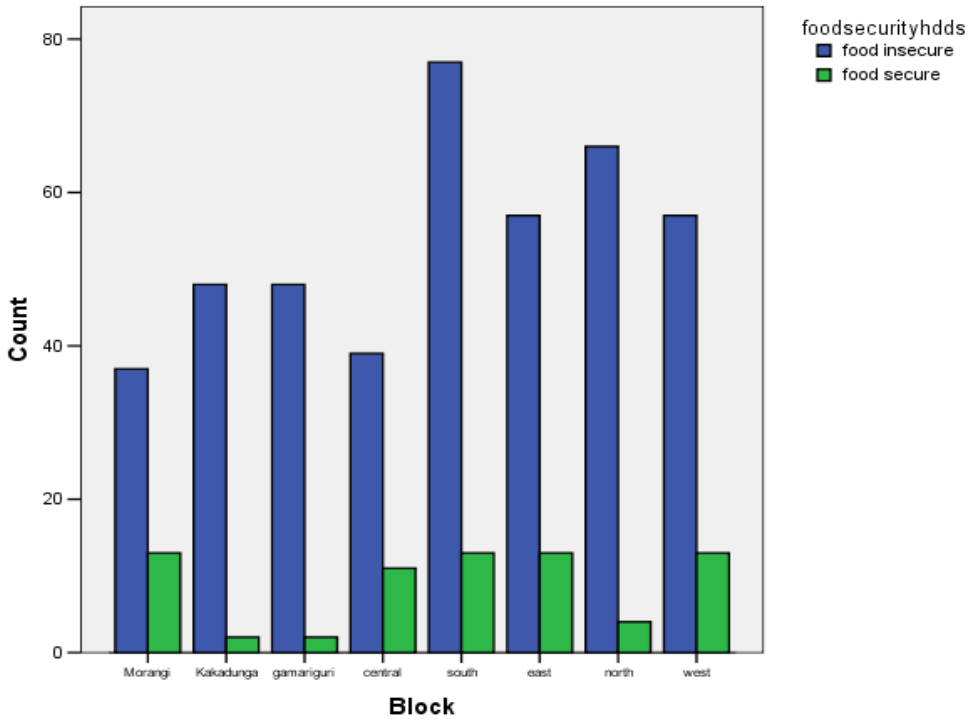


Figure V(7): Blockwise food security based on HDDS

**V.3. Comparison of the Extent of Food Security of BPL Households with and without BPL cards:**

The second objective of the present study is to compare the extent of food security of the BPL households with and without the BPL cards. In order to address this objective descriptive statistics, inferential statistics as well as simple regression model has been drawn. In the present study it has been found that out of the 500 sample BPL households, only 297 households have BPL (BPL or AAY) cards and remaining 203 families have APL (APL or MMASY) cards. The present study also endeavours to compare the food security status of the households having the BPL cards and the

households not having the BPL cards. Table no V(9) shows the descriptive results of the Food security status of BPL card having and not having BPL card households.

**Table No: V.9**

**Descriptive Results of the Food Security Status of People with BPL Card Having and without BPL Card**

| | BPL cards Holder (Total 297 nos) | Non BPL cards Holder (Total 203 nos) | Total (N=500) |
|---|---|---|---|
| Food Secured | 73 | 67 | 140 |
| Food Insecure | 224 | 136 | 360 |
| Head count Ratio (food insecure) | 75.42 | 66.99 | 72 |
| Food Insecurity gap (short fall index) | 18.56 | 18.94 | 18.71 |
| Surplus index | 5.48 | 4.19 | 4.86 |
| Squared food insecurity gap | 4.29 | 4.87 | 4.50 |

Source: Researchers own computation

Table no V(9) shows that out of the 140 food secured sample households, 73 households have BPL cards while 67 households do not have BPL cards. On the other hand, out of the 360 food insecure household, 224 households have BPL cards while 136 households have BPL card. Head count ratio shows that out of the 297 BPL card having households 75.42 households are food insecure whereas out of the 203 households which do not have BPL card, 66.99 percent households are food insecure. Head count ratio of the total sample household shows that 72 percent sample households are food insecure. Food insecurity gap or shortfall index of the sample households is 18.71 percent. This shortfall index is high in the sample households which have no BPL card (18.94 %) than the sample households having BPL cards (18.56%).

Surplus Index is also an important indicator of food security status. Higher surplus indicator shows better food security status. Table also shows that the overall surplus

index is 4.86 percent in the sample households. It is higher in the sample households having BPL card (5.45%) than the households not having the BPL card (4.19%).

Squared Food insecurity Gap also shows the severity of food insecurity of the households. Higher the squared food insecurity gap, higher the severity of food insecurity and vice-versa. Table no V(9) records that the squared food insecurity gap of the sample households was 4.50 percent. Squared food insecurity gap is higher in the households not having the BPL card (4.87%) than the households having the BPL cards (4.29%).

In a nutshell these indicators reveal that the food insecurity gap, surplus index and squared food insecurity gap are found to be better off in the sample households having BPL cards than the sample households not having BPL cards. But head count ratio contradicts it which shows that food insecure household's percentage is higher in the sample households having BPL card than the food insecure households not having the BPL card.

**V.3.(A) Severity level of food insecurity of households with BPL card and without BPL cards**:

Table no V(10) & fig. V(8) show the comparison of the severity level of food security of households having BPL cards.

**Table No: V.10**

**Level of food security of households with BPL card and without BPL cards**

| Households | Food secured | Marginally Food insecure | Moderately Food insecure | Severally Food insecure | Total |
|---|---|---|---|---|---|
| Having BPL card | 73 (24.58) | 151(50.84) | 67(22.56) | 6(2.02) | 297 |
| Not having BPL card | 67(33.01) | 102(50.25) | 29(14.29) | 5(2.46) | 203 |
| Total | 140(28) | 253(50.60) | 96(19.20) | 11(2.20) | 500 |

Source: Researcher's Own Computation

(Figures in the bracket shows percentage)

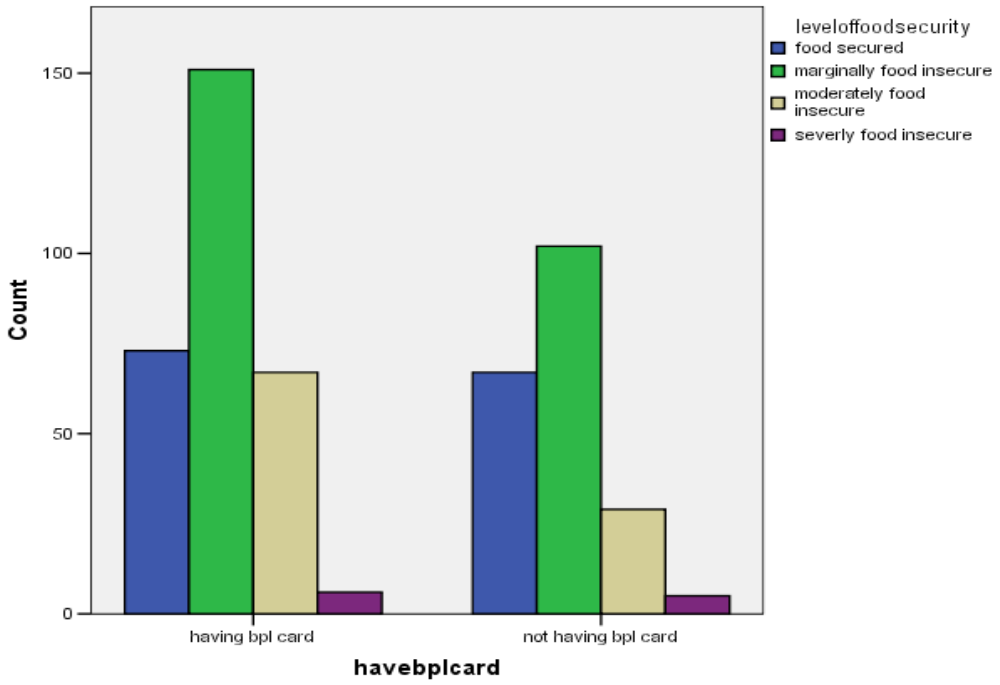


Fig. V(8): Severity level of food security having type of card

The above table-V(10) and figure depict that out of the 500 sample households 140 households are food secured, 253 (50.60%) households are marginally food insecure, 96 and11 households are moderately food insecure and severally food insecure respectively. Table also depicts that out of 253 marginally food insecure households 151 nos (50.84 percent of having BPL card households) have BPL card and remaining 102 nos (50.24 percent of non BPL card households) households not having BPL card. Out of the 96 nos moderately food insecure households, 67 nos (22.56 percent of having BPL card households) households have BPL card and remaining 29 nos ( 14.29 percent of non BPL card having household ) have no BPL card. Out of the 11 nos, severely food insecure households 6 nos (2.02 percent of having BPL card households) have BPL card and remaining 5 nos (2,46 percent of non BPL card having household ) do not have BPL card. It reveals that so far as the severity level of food insecurity is concerned there is no significant difference between the households having the BPL card and not having the BPL card

**V.3.(B)Independent Sample 't' Test:**

To test whether there is significant difference in the per capita calorie consumption between the households having the BPL card and not having the BPL card, an independent sample't' test has been drawn. The result is given in the table no V (11) below

**Table No: V.11**

**Per Capita Calorie Consumption of households having BPL and not having BPL Card**

| | Mean | N | Standard Deviation | Standard Error Mean |
|---|---|---|---|---|
| Having BPL Card | 2037.36 | 297 | 311.27 | 18.06 |
| Not Having BPL Card | 2078.29 | 203 | 301.18 | 21.39 |

Source: Researchers own calculation

Table no V(11) depicts that if we compare the mean value of per capita calorie consumption of households having BPL card and not having the BPL card we have seen that the average per capita calorie consumption of the households having the BPL card is lower than the households not having the BPL cards.

**Table No: V.12**

**Difference of Per Capita Calorie Consumption of Households having BPL Card and Not Having BPL Card**

| Independent Sample Test | Mean | Standard Error | 't' value | D.F |
|---|---|---|---|---|
| Having BPL Card<br>Not Having BPL Card | -40.93 | 27.98 | -1.463 | 498 |

Source: Researchers own calculation

From the above independent samples 't' test , it has been found that the mean value of the difference between the households having the BPL card and not having the BPL card is -40.93. The standard error difference is 27.98. The value of 't' distribution is found to be -1.463 which is lower than the critical value i.e. 1.96 at 5% level of significance. So we can conclude that there is no significant difference in the

per capita kcal consumption of the households having BPL card and not having the BPL card.

These all findings address the research question no (2) which urge that what is the extent of food security of the BPL households with and without having the BPL cards?

**V.4.Comparison between Rural and Urban Households Food Security Status:**

In the present study, both the rural as well as urban BPL households are taken into consideration to measure the household food security status. It is quite relevant to compare the food security status of both rural BPL households and Urban BPL households. So the present study also endeavours to compare the food security status of both rural and urban households. Table no. V (13) shows the descriptive results of the food security status of the sample rural BPL households and sample urban BPL households

**Table No: V.13**

**Descriptive results of Sample Rural and Urban Households**

| Sl No | | Rural Households (N = 400) | Urban Households (N = 100) | Total (N =500) |
|---|---|---|---|---|
| I | Food Secured | 101 | 39 | 140 |
| II | Food Insecure | 299 | 61 | 360 |
| III | Head Count Ratio (Food Insecurity) | 74.75 | 61.00 | 72.00 |
| IV | Food Insecurity Gap (Shortfall Index) | 19.56 | 14.54 | 18.71 |
| V | Surplus Index | 5.14 | 4.13 | 4.86 |
| VI | Squared Food Insecurity Gap | 4.71 | 3.49 | 4.50 |
| vii | Average Per Capita Calorie Intake (kcal) | 2080.51 | 1947.88 | 2053.98 |

Source: Researchers' Own Computation

Table no V(14) reveals that out of the 400 sample rural household, 101 nos (25.25 percent) are food secured, while on the other hand out of the 100 sample urban households 39 nos (39.00 percent) are food secured.

The head count ratio also depicts that in the rural area 74.75 percent sample households are food insecure whereas in the urban area it was 61 percent only and the overall food insecurity is 72 percent.

The table also reveals the food insecurity gap which shows the overall food insecurity gap is 18.71 percent. In the sample rural area, food insecurity gap was 19.56 percent, whereas it was 14.54 percent only in the sample urban area.

The squared food insecurity gap also signifies the poor situation of the sample rural area than its urban counterparts. Data reveals that the squared food insecurity gap was 4.71 percent in the rural area whereas it was 3.49 percent only in the urban area.

The surplus index, to some extent shows a better position of the rural food security status than its urban counterparts. The surplus index was 5.14 percent in the sample rural households; on the other hand this was marginally low in the urban areas where it was 4.13 percent only.

The per capita calorie consumption data reveals that although it was high in the sample rural households but it was less in percentage of daily requirement. It is revealed from the table that the average per capita calorie consumption in the sample rural households has been 2080.51 kcal which was 86.69 percent of the per capita calorie requirement, whereas on the other hand in the urban households the average per capita calorie consumption has been 1947.88 kcal which was 92.76 percent of the per capita calorie requirement.

Severity level of food insecurity is also one of the important indicators of food security status. Table no V(14) shows the severity level of food insecurity of sample rural and urban households.

**Table No:V.14**

**Level of Food Security of Sample Rural and Urban Households**

| Households | Food Secured | Marginally food insecure | Moderately food insecure | Severely food insecure | Total |
|---|---|---|---|---|---|
| Rural | 101 (25.25) | 225 (56.25) | 64 (16) | 10 (2.50) | 400 (100) |
| Urban | 39 (39) | 28 (28) | 32 (32) | 1 (1) | 100 (100) |
| Total | 140 (28) | 253 (50.60) | 96 (19.20) | 11 (2.20) | 500 (100) |

Source: Researchers' Own Computation

The table reveals that in the rural area 25.25 percent (101 nos) households are food secured, whereas in the urban area 39 percent (39 nos) sample households are food secured. In the rural area, the rate of marginally food insecure is very high where 56.25 percent (225 nos.) sample households are marginally food insecure whereas on the other hand 28 percent (28 nos) sample urban households are marginally food insecure. 16 percent (64 nos) rural sample households are moderately food insecure, whereas in the urban area it was 32 percent (32 nos). The table also reveals that 10 nos (2.5 percent) sample rural households are severely food insecure whereas only 1 percent (1 nos) urban sample households are severely food insecure.

So in a nutshell it is quite clear that so far as the food security status of rural and urban BPL households is concerned, the food security status of urban BPL households is to some extent better than its rural counterparts. This may be due to diversified employment opportunities as well as low per capita calorie requirement in the urban area.

**V.5.Determinants of Food Security:**

The third objective of the present study is to identify the determinants of food security among the BPL households of the Golaghat District of Assam. To determine the significant socio-economic and demographic variables which influence the food security status of BPL households of the study area, descriptive statistics, inferential statistics as well as binomial logistic regression model have been drawn. Based on socio economic theories, empirical works, and type of qualitative data collected during the survey, eight explanatory variables which are expected to have significant

impacts in determining the food security status of the sample BPL household in the study area are selected and hypothesized. These variables are;

**(i) Sex of the Household head:**

Sex of the household head is considered as one of the important determinants of the food security status of the households. It has generally been argued that households run by women are more vulnerable to food insecurity. Male headed households have more access to occupational diversity; have more labour power and high asset like farmland, livestock and other assets as compared to female headed households (Tsegaye and Bekele, 2010). Cultural restrictions on women's ability to participate fully in food production activities in the poorest areas and consumption of more time on child care increase the probability of female headed households food insecurity status. (Kassie, 2012) Thus male headed households are hypothesized to be more food secure than female headed households. Sex of the household head is represented in the study by a dummy variable that is 1 if the household head is male and 0 if the household head is female.

**(ii) Occupation of the Household head:**

Occupation of the household head also can influence the food security status of the household. It is generally argued that food security status of those households that are engaged in agriculture is poor. Thus the study hypothesized that the family of which household head are engaged in agriculture is more food insecure than the others. Hence occupation of the household head is represented in the study by a dummy variable that is 1 if the household heads occupation is agriculture and 0 if otherwise.

**(iii) Age of the Household head:**

Age of the household head also plays an important influence on household food security status. Both rural and urban BPL households mostly devote their lifetime or base their livelihood on both farm and nonfarm enterprises. As age of the households head increases, they can acquire more knowledge and experience and the chance of a household to become more food secure increases (Tsegaye and Bekele, 2010). It also reveals that older persons are more risk averters and mostly they tend to be food insecure is less (Olagunju et. al, 2012). In the present study, age of the household

head is measured in years and hypothesized to affect the food security status positively. This hypothesis is supported by findings of Olagunju et.al (2010) and Abebaw (2013) that age of the household head has positive relation with food security status of households.

**(iv) Education of the Household head:**

Level of education in the present study is measured by the level of schooling years attained by the household head. It is a variable assigning values from 1 to 5, 1 for illiterate, 2 for literate upto class 5, 3 for upto 5 to 10, 4 for upto class12 and 5 for upto graduate and above. It is an important determinant of household's food security. Empirical studies reveal that educational households have a chance of adopting better livelihood measures which in turn increases the income of the household. (Olagunju et.al 2013, Faridi & Wadood 2010) Moreover, educated households are very sensitive to management of renewable and non-renewable resources in view of averting risk condition of food insecurity (Tsegaye & Bekele, 2010). Thus the study hypothesized that education level of the household head have positive impacts on household food security.

**(v) Household Size:**

Household size refers to the total number of person living in the household. It could have both positive and negative impacts on food security status of the households. It is inevitable that a family size with more inactive labour force shows a high dependency ratio and vice versa. High family size with large number of inactive labour force affects negatively the availability and accessibility to enough food on time for active and healthy life. The present study hypothesized that large size of household size results in increase of food demand and ultimately end up with increase food insecurity which is supported with findings of Abebaw (2003), Yimla et.al (2010) Bashir et.al (2010) Sindhu et.al (2008) and Tsegaye and Bekele (2010).

**(vi) Income of the household:**

Income of the household has a significant determinant of household food security status. It can definitely influence the household food security status. Here household income refers to monthly income earned by the household head as well as the other

members of the household during the last month of the survey. It is generally argued that a household having high monthly income expects better food security status and vice versa. Various studies (Bashir et.al ,2010, Sindhu et.al 2008, Babtunde et.al 2007, Onionwa and Wheelock 2006) confirm that household with higher income group are more likely to become food secure as compared to the households having less income. The present study hypothesizes that higher monthly income group is more food secure.

(vii) **Livestock Owned**:

Livestock owned is a continuous variable defined as the total livestock (no of cattle, goat, poultry and pig) owned by the sample household measured in Tropical Livestock Unit (TLU) as suggested by Debele (2006) and Strock et.al (1991). Livestock using conversion factors as (1 cattle= 0.7 TLU, 1 goat= 0.1 TLU, 1 poultry = 0.01 TLU, and 1 pig = 0.2 TLU). Livestock is an indicator of wealth, source of income sources of draft power which in turn increases crop production, as coping mechanisms for food insecurity and for source of food. The present study hypothesizes that livestock owned have a positive relationship with household food security and this hypothesis supported by Haile et.al (2005), Maharaja and Joshi (2011) , Shumiye (2007) Guja (2012) Tsegaye and Bekele (2010)

**V.5. (A) Descriptive Statistics:**

Based on recommended daily food intake of 2400 kilo Calorie per capita for rural households and 2100 kilo calorie per capita for urban households, it was observed that out of the 500 sample households, 28 percent (140 nos) of the sample BPL households of the sample BPL households of the Golaghat district are food secured while remaining 72 percent (360 nos) were food insecure. Summary statistics of selected predictor variable are presented in table no. V (15)

**Table No- V.15**

**Summary of Descriptive Statistics for Continuous Variable**

| Variables | Food Secure (N=140) | | Food Insecure (N=360) | | Total (N= 500) | | Z Value |
|---|---|---|---|---|---|---|---|
| | Mean | Standard Deviation | Mean | Standard Deviation | Mean | Standard Deviation | |
| Age of the Household Head (Years) | 39.957 | 10.061 | 49.0861 | 10.624 | 46.53 | 11.236 | 9.923** |
| Household Size (In Numbers) | 3.843 | 1.183 | 5.133 | 1.496 | 4.772 | 1.592 | 9.04** |
| Per Capita Income (In Rs. Per mnth.) | 947.5357 | 388.60 | 739.82 | 302.28 | 793.60 | 337.27 | 5.69** |
| Live Stock (TLU) | 1.013 | 1.190 | 1.472 | 1.524 | 1.344 | 1.452 | 3.29** |

Source: Tabulation from Primary Data 2014

** Significant at 5% level of significance

Table V (15) shows that the age of the household head of the total sampled household ranged from 20 upto 84 years and the overall mean age value is 46.53 years. The age of the food secured households head ranges from 20 to 76 years having the mean age value of 39.957 years. While, on the other hand, the age of food insecure household heads ranges from 25 upto 84 years with the mean age value of 49.086 years. In addition the probability value of Z test is 9.923 which are significant at less than 5% probability level. This implies that age of the household heads affecting the households' food security status significantly.

The size of the family of the total sampled households is ranges from 1 nos to 13 nos and average size of the total sampled household is 4.772 nos. The size of the household of the food secured households ranges from 1 upto 8 nos having the average size of the family is 3.843. On the other hand the size of the household of the food insecure household ranges from 2 up to 13 nos, having the average size of the household is 5.133 nos. The standard deviation of the household size in the food secure and food insecure household are found to be 1.183 and 1.529 respectively. The probability value of the z test is 9.04 which are significant at 5% level of significance, which implies that household size is affecting the households' food security status significantly.

The result obtained from the table depicts that per capita income of the total sampled households ranges from Rs. 285.71 upto Rs. 2750 and overall mean per capita income is Rs. 793.60. The per capita income of the food secured households ranges from Rs. 333.33 upto Rs. 2750 having the mean per capita income is Rs. 947.54. Whereas the per capita income of the food insecure households ranged from Rs. 285.71 upto Rs. 2400 having the mean per capita income is Rs. 739.82. The standard deviation of per capita income of food secured and food insecure households are found to be Rs. 388.60 and Rs. 302.28 respectively. The probability value of the z test is 5.69 which are significant at 5% level of significance. It implies that per capita income affecting the household food security status significantly.

The total livestock possessions by the respondent households have been converted by following (Debele, 2006 and Sorck et.al 1991) conversion factor into their respective TLU values. The amount of TLU of the total sample households ranged from 0 to 8.81 having mean TLU is 1.344. The TLU values of the food secured households ranged from 0 to 4.69 where the mean TLU is 1.013. On the other hand, the TLU value of the food insecure households is ranged from 0 to 8.81 having the mean TLU value is1.472 units. The standard deviation of the TLU values of the food secured and food insecure sample household are 1.190 and 1.472 respectively. The P value of the Z test is 3.29 which is also significant at less than 5% probability level. It reveals that the livestock holding significantly affecting the food security status of sample BPL households.

As like the continuous predictor variable the selected dummy discrete variables as descriptive statistics are presented in table no – V(16)

**Table No-V.16**

**Summary of Descriptive Statistics for Discrete Variable**

| Variable | | Food Secure | Food Insecure | Total | $\chi^2$ value |
|---|---|---|---|---|---|
| Sex of HOH | Male | 128 (29.70) | 303 (70.30) | 431 | 4.31** |
| | Female | 12 (17.39) | 57 (82.61) | 69 | |
| Education of HOH | Illiterate | 19 (21.84) | 68 (78.16) | 87 | 17.794* |
| | Class 1-5 | 28 (20.90) | 106 (79.10) | 134 | |
| | Class 6-10 | 70 (30.30) | 161 (69.70) | 231 | |
| | Class10-12 | 18 (45.00) | 22 (55.00) | 40 | |
| | Graduate and above | 5 (62.50) | 3 (37.50) | 8 | |
| Occupation of HoH | Agriculture | 42 (23.08) | 140 (76.92) | 182 | 3.47*** |
| | Others | 98 (30.82) | 220 (69.18) | 318 | |

Source: Tabulation from primary data 2014

*= significant at 1% level of significance, **= significant at 5% level of significance, ***= significant at 10 % level of significance

(Figures in the bracket shows percentage)

Table no V(16) Depicts that among the 500 sample households the number of female headed and male headed households are found to be 69 and 431 in numbers and covers 13.8 percent and 86.2 percent respectively. Out of the 69 female headed households, 12 nos which account only 17.39 percent female headed households are food secure. Whereas 57 nos accounting 82.61 percent are food insecure. On the contrary, among the 431 male headed households only 128 nos (29.70 percent) and 303 nos (70.30 percent) are found to be food secure and food insecure respectively. The chi-square result 4.31 shows that it is significant at less than 5% probability level, which implies sex of the household head significantly affects the sample household's food security status.

The educational level of the sample household heads are categorized under five intervals like illiterate, literate upto class 5, class 6 to class 10, class 10 to 12 and graduate and above. The result reflects that out of the 500 sample household head 87 nos are illiterate which accounts 17.4 percent of the total sample household head. Out of this 87 nos heads, 19 nos (21.84 percent) and 68 (78.16 percent) are found food secure and food insecure respectively. Only 9.6 percent (48 nos) of the total sample

household heads education qualification is class 12 and above. Out of this 23 nos (47.92 percent) and 25 nos (52.08 percent) are food insecure respectively. The majority of households from both food secure (70 nos) and food insecure (161 nos) households under education level from class 6 to class 10. About 20 percent of food secure household and 29.44 percent of food insecure households have an educational level which ranges from class 1 to class 5. The probability value of chi- square test is 17.794 which is significant at 5 % level. This implies that educational level of the household head is affecting the households' food security status significantly.

The occupation of the sample household heads is categorized under the intervals by considering a dummy variable, categorizing as household heads occupation is agriculture and others. The result reveals that out of the total 500 sample household heads, 182 nos (36.4 percent) household heads occupation is agriculture and remaining 318 nos (63.6 percent) household heads occupation is others. Out of the 182 nos households which heads occupation is agriculture, 42 nos (23.08 percent) and 140 nos (76.92 percent) are food insecure respectively. On the contrary, out of the 318 nos households which heads occupation is non-farm, 98 nos (30.82 percent) and 220 nos (69.18 percent) are food secure and food insecure respectively. The chi- square result, which p value is 3.47 is significant at less than 10 % probability level, which depicts that household heads occupation significantly is affecting the household food security status.

**V.5. (B) Econometric Analysis for Socio Economic and Demographic Determinants of Food Security:**

**V.5.(B)(1) Binary Logistic Regression Analysis:**

To determine the significant social economic and demographic factors for food security status of the sample BPL households, a binary logistic regression model has been drawn taking food security status of the sample household as a dependent variable and the entire predictive variable as independent. All total 7 expected predictive variable are chosen as the probable significant determinant of household food security status of the sample BPL households. The selected predictive variables are: Log of Per capita income of the household (LnPCI) , Log of Age of the household head (LnAGE), Sex of the household head (SEX) , Education level of the

household head (EDU), Occupation of the household head (OCU), Log of Size of the family (LnFSZ), and Livestock ownership (TLU),

Before entering the independent variables into the model, the multi collinearity problems were checked in terms of Variance Inflation Factor (VIF) for continuous and contingency coefficients for dummy and discrete variables respectively. As a rule of thumb when the variables having VIF values having less than the cut off value 5 (Shumiye 2007, Guga 2012) are believed to have no multicollinearity problems and those with VIF of above 5 are assumed to have a multicollinearity problem. In the present study the computational result of VIF for continuous variables is less than 5, which confirm the non existence of association between the independent continuous variables and hence included in the model.

Besides as rule of thumb, the threshold for contingency coefficients for dummy and discrete variables is 0.75 (Guja 2012). The values below 0.75 indicate the weak association and above 0.75 indicate strong association of variables. In the present study the result obtained regarding dummy and discrete variables are less than 0.75. Therefore this indicated that there is no any multicollinearity problem detected in the model.

The goodness of fit of the model has been measured in terms of count $R^2$ which works on the principle that if the predicted probability of the event is greater than 0.50 the event will occur, otherwise the event will not occur. The result of the model shows that the correctly predicted percent of sample household is 82.8 percent which is greater than 0.5. Additionally the sensitivity and specificity, which correctly predicted food secure and food insecure has been found 59.3 percent and 91.9 percent respectively, indicated that the model has been estimated the food secure and food insecure correctly.

The Binary logistic regression model for determining the significant socio economic and demographic factors of household food security status is given by

$$\mathbf{Y_i = 1/ [1 + e^{-( ß_0 + ß_1 LnPCI + ß_2 LnAGE + ß_3 SEX + ß_4 EDU + ß_5 OCU + ß_6 LnFSZ + + ß_7 TLU +) + U_i ]}}$$

Where $Y_i$ = '1' if the household is food secure

'0' if otherwise

Ln PCI= Log of Per Capita Income

LnAGE = Log of Age of the household head

SEX = Sex of the household head as dummy '1' if the head is male

'0' if the head is female

EDU= Educational level of the household head Age of the household head

OCU = Occupation of the household head

1 = If the occupation is agriculture

0= Otherwise

LnFSZ= Log of Size of the family

TLU = Livestock ownership

$U_i$= Stochastic Error Term

The result of the present model is shown in the table no. V(17)

**Output of the Binary Logistic Regression Model**

**Table No – V.17**

**Determinant of Household Food Security Status**

**Binomial Logistic Regression Result**

**Dependent Variable—Household food security status**

| Variables | Coefficient | Standard Error | Odd Ratio | 'Z' | P> \|Z\| |
|---|---|---|---|---|---|
| LnPCI | 0.7531 | 0.5758 | 1.8725 | 1.84 | 0.096*** |
| LnAGE | -3.1492 | 0.6371 | 0.0429 | -4.94 | 0.000* |
| SEX | 1.6013 | 0.4434 | 4.9595 | 3.62 | 0.000* |
| EDU | 0.0615 | 0.0330 | 1.0635 | 1.86 | 0.062*** |
| OCU | 0.1815 | 0.2811 | 1.1990 | 0.65 | 0.518 |
| LnFSZ | -3.0021 | 0.5148 | 0.0497 | -5.83 | 0.000* |
| TLU | -0.3398 | 0.2603 | 0.7118 | -1.31 | 0.192 |
| CONSTANT | 9.7689 | 3.6398 | 17101.098 | 2.68 | 0.007** |

Number of Observation= 500

LRChi$^2$ (7) = 157.45

Probability> Chi$^2$ = 0.000

Pseudo $R^2$ = 0.2655

Log likelihood = - 217.7514

* = Significant at 1% level , ** = Significant at 5% level, *** = Significant at 10% level.

The result from the table no V(17) reveals that out of the 7 predictor variables, five variables are significant determinant of household food security status of the sample BPL household. These are log of per capita income of the household, log of age of the household head, sex of the household head, education level of household head and log of family size. The LR tests coefficients had a chi-square value is 157.45 on 7 degrees of freedom, which is highly significant beyond 0.001 level indicating that the predictor variables presented in the above table have a joint significant importance in predicting household food security status. The model chi-square value indicates that the inclusion of the explanatory variables contributed to the improvement in fit of the full model as compared to the constant only of the model. The Pseudo R square value of the model was 0.2655. The Hosmer and Lameshow test result reported chi- square value is 11.123 with 'p' value of 0.195 on 8 degrees of freedom. But this 'p' value is greater than the 0.10 and 0.05 levels showing that there is no deference between the observed and the model predicted values and hence estimates of the model fit the data at an acceptable level. Assessment of the interaction terms showed that none of them are statistically significant and hence was excluded from the model.

**(i) Per Capita Income of the Household:**

As expected the log of per capita monthly income of the household has positive impacts on household food security status and was significant at 10 % level of significance. The odd ratio (1.8725) of log of per capita monthly income indicates that keeping other variable constant, when the log of per capita monthly income increases by one unit, the probability of a household to be become food secure increases by the factor of 1.8725. The possible explanation is that those households have sufficient access to income can expense more for their requisite food stuffs, which make them more likely to be food secure than those who don't have enough access. The result confirms the hypothesis that higher per capita monthly income BPL households are more food secure than the lower per capita monthly income households. The result agrees with the findings of Bashir et.al (2010), Sindhu et.al (2008), Babatunde et. al (2007), Onianwa and Wheelock (2006), Tsegaye & Bekele (2010).

**(ii) Age of the Household Head:**

The log of age of the household head has the negative impacts on food security status and was significant at 1% level of significance. The coefficient (-3.1492) of the log of age of the household head implies that holding other variable constant, if the age of the household head increases, it decreases the log of odd of household food security status by 3.1492 units. The odd ratio (0.0429) of the log of age of the household head indicates that as the age of the household head increases by a single year, keeping other factors remain the same, the likelihood of the households being food secure decreases by factor of 0.0429 units. These findings reject the hypothesis that when the heads age advances, they were expected to have stable economy and food secure than younger heads. The result agrees with the findings of Bashir et.al (2010), Guja (2012) and Titus and Adetokudo (2007) but contradicts with the result of Onianwa and Wheelock (2006).

**(iii) Sex of the Household:**

The model reveals that sex of the household head was significant at 1% level and positively related with food security status of the household. This implies that male headed households are more likely to be food secure than the female ones. The coefficient (1.6013) of sex of the household head indicates that holding other variables constant, if the sex of the household head is male, it increases the log of odd of household food security status by 1.6013 units. The odd ratio (4.9595) of sex of the household head indicates that keeping other regressor constant, if the male headed household increases by one unit, than there is 4.9595 times more chance that the household food security status increases. This can be reasoned that male household heads engage better in any productive activities related to food security than female heads. The findings of this work is supported with findings of Tsegaye and Bekele (2010), Maharajan and Joshi (2011) and Guja (2012) who reveals that male headed households are more food secure than the female headed one.

**(iv) Educational Level of the Household Head:**

The model also reveals that the education level of the household head has positive impacts on household food security status and is significant at 10 % level of

significance. This implies that as the households with higher education level of household head are more likely to be food secure than its counterparts. The odd ratio (1.0635) of educational level of the household head indicates that keeping other variable constant, when the educational level of the household head increases by one unit, the probability of a household to be become food secure increases by the factor of 1.0635. The result confirms the hypothesis that the BPL households having higher education level of household head are more food secure than the BPL households having lower education level of household head. The result agrees with the findings of Bashir et.al (2012), Asghar & Ahmed (2012), Gebre (2012), Faridi & Wadood (2010), Tsegaye & Bekele (2010).

**(v) Family Size:**

The log of the family Size has negative impacts on household food security status and was significant and at 1 % level of significance. The odd ratio (-3.0021) implies that as family size increases by one person, the likely probability to become food secure decreases by a factor 3.0021. An increase in family size may need higher amount of food stuff, with the limited income this higher demand of food may tends to the households to be food insecure. The finding confirms the hypothesis that a household with small size are more food secure. The result supported with the findings of Bashir et.al (2010) , Sindhu et.al (2008), Rose et al (1998), Babatunde et.al (2007), Haile et.al (2005) but contradicts with the findings of Maharajan and Joshi (2011).

The influence of other variables on household food security status such as occupation of the household head and livestock ownership are not found to have significant impact.

**V.5.(B).2. Simple Regression Model:**

In order to incorporate the magnitude of food insecurity of the sample households a simple regression model has been run, where the per capita daily calorie intake of the sample household has been taken as dependent variable and all the explanatory independent variable taken in the binary logistic regression model are also taken as independent variable. The simple regression model is given by---

$$Yi = ß_0+ß_1LnPCI+ß_2LnAGE+ß_3SEX+ß_4EDU+ß_5OCU+ß_6LnFSZ+ +ß_7TLU + U_i$$

Where $Y_i$ = Per Capita Calorie intake of the ith household

Ln PCI= Log of Per Capita Monthly Income

LnAGE = Log of Age of the household head

SEX = Sex of the household head as dummy '1' if the head is male

'0' if the head is female

EDU=Educational level of the household head

OCU = Occupation of the household head

1 = If the occupation is agriculture 0= Otherwise

LnFSZ= Log of Size of the family

TLU = Livestock ownership

$U_i$= Stochastic Error Term

The result of the present model is shown in the table no. V (18)

**Table No: V.18**

**Determinants of Household Per Capita Calorie Consumption Status**

**Simple Regression Model Result**

**Dependent Variable: Per Capita Calorie Intake**

| Variable | Unstandardized Coefficients (ß) | Standardized Coefficients (ß) | 't' Value | Significance |
|---|---|---|---|---|
| CONSTANT | 2838.770 | | 8.312 | 0.000* |
| LnPCI | 109.019 | 0.126 | 2.877 | 0.004* |
| LnAGE | -327.858 | -0.257 | -5.463 | 0.000* |
| SEX | 134.864 | 0.151 | 3.703 | 0.000* |
| LnEDU | 1.749 | 0.022 | 0.558 | 0.577 |
| OCU | 86.297 | 0.135 | 3.097 | 0.002* |
| LnFSZ | -280.797 | -0.305 | -6.289 | 0.000* |
| TLU | 24.340 | 0.128 | 1.667 | 0.095*** |

F= 26.903* $R^2$ = 0.277 Adjusted $R^2$ = 0.267

* = Significant at 1% level , *** = Significant at 10% level

The model depicted in the table no. V(18) shows that it explains 27.7 % of variation in the per capita calorie intake in the study area. The 'F' value was 26.903 indicating that the model was significant at 1% level. The adjusted $R^2$ value was 26.7 %. The table shows that out of the seven independent variables, six variables are significant. These are per capita monthly income, age of the household head, sex of the household head, occupation of the household head, family size, and livestock ownership. Out of this per capita monthly income, sex of the household head, occupation of the household head, dependency ratio and livestock ownership are positively related with per capita calorie intake and age of the household head and family size are negatively related with per capita calorie intake. The model shows that education level of the household head is not significant for determining per capita calorie intake.

The log of per capita monthly income of the household was significant at 1% level with a positive coefficient 0.126 which implies that other variables being constant, a unit increase in per capita monthly income of the households increases the per capita kcal consumption of the household by a factor of 0.126.

In the model the log of the age of household head was significant at 1% level with a negative coefficient of -0.257 which implies that other variables being constant a unit increase in the age of the household head decreases the per capita kcal consumption of sample household by a factor of 0.257. The result contradicts with the findings of Kaloi et.al (2005).

Sex of the household head was significant at 1% level with a positive coefficient of 0.151 which implies that other variables being constant a unit increase of male headed household increases the per capita kcal consumption by a factor of 0.151. The result confirms with the findings of Babtunde et. al (2010) and Bazezew (2012).

Occupation of the household head was significant at 1% level with a positive coefficient of 0.135 which implies that other variable being constant a unit increase in the household s having occupation of the household is agriculture, increases the per capita kcal consumption by a factor of 0.135.

The log of family size was also a significant determinant of per capita calorie consumption in the present model. It was significant at 1% level with a negative

coefficient of -0.305 which implies that other variables being constant; a unit increase in the family size decreases the per capita kcal consumption of the sample household by a factor of 0.305 units. The result agrees with the findings of Kraybll and Bashaasha (2005), Sanya and Halen (2003) and Kaloi et.al (2005).

In the present model livestock ownership measured in term of TLU was also a significant determinant of per capita kcal consumption which was found significant at 10% level with a positive coefficient of 0.128 which implies that other variables being constant a unit increase in TLU increases the per capita kcal consumption of the sample household by a factor of 0.128 unit.

These all findings address the research question no (2) which urges that what are the various factors which determine the food security status of the BPL households