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## Food Security Condition in Aligarh: A Block Level Analysis

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### Abstract:

Food security is an important determinant of quality of life and its pattern and level of food security is the outcome of the different socio-economic-ecological resource utilization and management. The paper selected the Blocks of Aligarh district as its research area and tries to find out the variation in the food security pattern on the basis of the secondary data of all four dimensions of food security. The paper calculated the Z score for all 12 blocks of the district and arranges them in the category of high, medium and low. The result show that out of 12 blocks Chandaus, Dhanipur, Gangiri, Atrauli lies in high category while Tappal, Khair, Jawa, Lodha are in medium category and Gonda, Iglas, Bijauli, Akraabad are under low category. The paper also tries to find out the reasons of variation for the block level variations and suggest some policy and institutional measures to improve the food security condition in the district.

**Keywords:** Food security, resource utilization, z- score, policy and institutional measures

### 1. Introduction

Conventionally food is supposed to be one of the basic human needs within the hierarchy of concerns (Maslow, cited in Handy 1985) and is defined as the any substance consumed to provide nutritional support for the body and food security is the condition of the security of accessibility and availability of food resources to all people at all time in the sustainable manner.

The food security condition is the most researchable topic in recent times because on the one hand it is the important determinant of the good quality of human life and its level and pattern determine the utilization and management of the socio-economic-ecological resources and at the same time the food security is threatening due to the depletion of resources and variability in the climatic condition. Retiungler's(1985) define the food security as " it is access by all people at all times to enough food for an active and healthy life" and Coulblay defines its meaning as the regular availability of food supplies taking into account the food habits and economic power of a population. Thus the all four dimensions of food security should be analysed holistically to know the condition of food security.

### 2. Aims and Objectives

- To find out the pattern of food security in the blocks of the Aligarh district
- To find out the reasons of the variations of food security in different blocks
- To find out some measures to improve the food security in the low food security blocks

### 3. Methodology

The paper uses the z -score method to find the pattern of food security in different blocks. For this there are some selected indicators for all four dimension of food security for all 12 blocks. Then z score is calculated to each block and each indicator. Then with the help of these z score values a composite z score is calculated. On the basis of which all blocks are divided into high, medium and low category.

### 4. Study Area- Aligarh

Aligarh is an important district in the north western Uttar Pradesh and administratly forms a part of Agra division. It extends from 27° 27' N to 28° 11' N latitudes and 77° 27' E to 78° 38' E longitudes and lies in the part of fertile Ganga Yamuna doab. It is bounded by Bulandshahr district in the north, Mathura in the west and south west, Hathras in the south and Etah in the east. The extreme north eastern boundary and extreme north western boundary of the district is formed by the two important rivers Ganga and river Yamuna respectively. Based on administrative convenience, the district has been divided into 5 sub divisions i.e. tehsils namely Koil, Khair, Gabhana, Atrauli, and Iglas. These tehsils are further sub- divided into 12 development block namely Atrauli, Gangiri, Bijauli, JawanSikanderpur, Chandaus, Khair, Tappal, Dhanipur, Lodha, Akraabad, Iglas, and Gonda. These blocks are the smallest unit of study in the research paper.

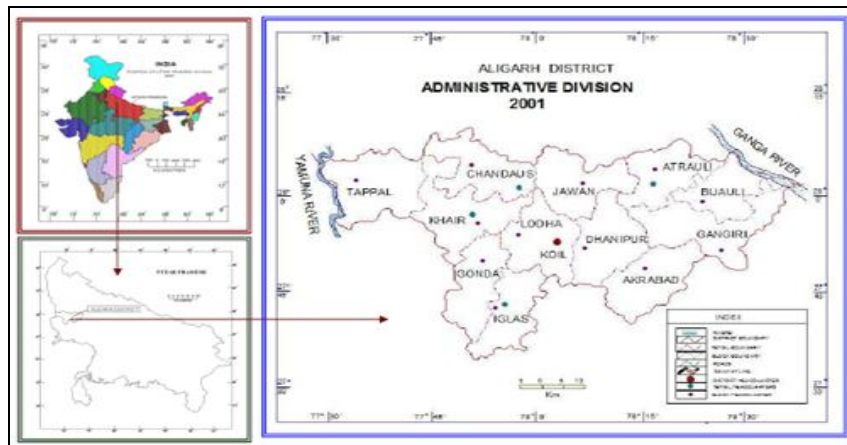


Figure 1: Study Area-Aligarh  
Source: Administrative Atlas 200

The research area Aligarh is selected to show the pattern of food security because i) It is an established fact that the incidence of malnutrition and hunger status in Aligarh district ranks it in the most 100 vulnerably food insecure districts in India as selected by World Bank and HUNGAMA report. ii). Out of the total 70 districts in Uttar Pradesh World Food Programme (WFP) selected 28 require priority attention districts to ensure food security in the state and Aligarh is one of them. Thus the analysis of the food security pattern in the research area helps us to understand the spatial dimension of food security with causal analysis.

### 5. Block level analysis of food security pattern in Aligarh district

To analysis the block level pattern of food security a range of indicators are selected for all four dimension of food security as follows:

- Indicators selected to access food security condition ----

#### 5.1. Food Availability

- X1 % of area under food crops to gross sown area
- X2 % of Net sown area to total area

#### 5.2. Food Accessibility

##### 5.2.1. Physical access

- X3 Total pakka road lengths per lakh of population
- X4 PDS coverage of village in %

##### 5.2.2. Economic access

- X5 Percentage of BPL families
- X6 % of main workers to total population

#### 5.3. Food utilization

- X7 No of PHC per lakh of population
- X8 Percentage of villages having hospitals within 5 km
- X9 Literacy rates in percentage for male
- X10 Female literacy
- X11 No. of Mahila mandalas
- X12 % of SC population
- X13 Mother, child welfare status
- X14 No. of anganwadi centre

#### 5.4. Food Stability

- X15 Cold Storage facilities
- X16 Rural godowns capacity in MT

The selected indicators give the micro- level pattern of each dimension of food security. The calculation of z score give the more clear picture about the food security condition in these blocks as calculated below-

Indicators	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13	X14	X15	X16	CZS	RANK
Blocks																		
Tappal	-0.27	0.55	-1.19	0.72	2.68	-0.42	-0.87	-0.27	0.56	0.30	-0.48	0.63	-0.89	0.42	-0.68	-0.28	0.03	Medium
Chandaus	0.17	0.83	-0.23	0.96	-0.47	1.76	-0.32	-0.43	0.71	1.00	-1.56	0.16	0.39	0.12	-0.68	-0.95	0.09	Medium
Khair	-0.42	0.81	-0.42	-0.56	0.13	-1.19	0.45	-0.95	0.70	0.46	1.03	0.07	-0.03	-0.67	1.35	0.06	0.05	Medium
Jawa	0.64	-1.02	-0.89	0.45	-1.30	-0.94	0.56	0.82	0.34	0.63	-0.55	0.66	0.82	1.24	-0.52	-1.29	-0.02	Medium
Lodha	-0.42	-1.13	0.02	-0.87	-0.45	0.60	0.12	1.13	0.30	0.88	-0.19	0.93	-0.46	-0.07	0.57	-0.28	0.04	Medium
Dhanipur	0.54	-0.88	0.46	-0.04	0.23	0.73	-0.32	-1.26	-0.25	0.25	0.96	1.40	0.82	0.15	0.26	1.06	0.25	High
Gonda	-0.56	0.91	-0.40	-0.67	0.88	-1.58	-0.21	-0.75	1.00	0.27	0.24	-0.18	-0.03	-0.45	-0.36	-0.62	-0.15	Low
Iglas	-2.66	0.74	0.29	-2.34	-0.49	1.12	-1.53	0.64	0.60	0.30	-0.55	1.18	-0.89	-1.09	2.44	0.73	-0.09	Low
Atrauli	0.41	0.64	2.15	0.39	-0.17	-0.42	2.10	1.33	0.07	-0.29	-1.56	-1.29	1.24	0.30	-0.68	-0.62	0.22	High
Bijauli	0.76	-2.05	-0.53	1.35	-0.34	0.47	1.33	0.40	-1.97	-2.10	0.67	-1.29	-0.03	-0.97	-0.68	0.06	-0.30	Low

Gangiri	0.81	0.52	-0.85	0.63	-0.67	-0.42	-0.54	0.93	-2.04	-1.93	1.61	-1.11	1.24	2.22	-0.36	2.41	0.15	High
Akrabad	1.02	0.06	1.58	-0.05	-0.04	0.35	-0.76	-1.59	-0.02	0.24	0.38	-1.14	-2.16	-1.20	-0.68	-0.28	-0.26	Low

Table 1: Composite z score value chart for all indicators at block level

Source: calculated by author on the basis of Statistical Handbook of Aligarh district, 2012

As the resulted pointed out that the Chandaus, Dhanipur, Atrauli, and Gangiri are high food secure blocks and the reason lies in the fact that these blocks have the high ranking in selected indicators. In the category of % of area under food crops to gross sown area all these blocks have more than eighty percent coverage area. Chandaus have 81.7% Dhanipur (84.5%), Atrauli (83.5%), Gangiri (86.6%) while other blocks except Akrabad have medium to low coverage area under food crops. Iglas has the lowest percentage of crop area(59.8%) and also ranks in the low food secure block. Analysis for the second indicator also follow the same pattern that the high percentage of net sown area to total area support to high production and thus increase the production and ensure the high food availability. Chandaus has more than 85.79% irrigated area to total area, Dhanipur( 79.77%), Atrauli (85.12%), and Gangiri (84.67%) have the more favourable irrigated condition. Though, Gonda has the maximum net irrigated area as 86.05% but due to other factors influence its agriculture production is not converted into food security and it lies in the low food secure region. In the food availability composite value Atrauli, Gangiri, Akrabad, Chandaus have high food availability and Tappal, Gonda and Dhanipur are in medium category and Bijauli, Iglas are in low category and this is also results in the corresponding overall food security pattern.

Accessibility composite index indicate that except Chandaus, Atrauli the pattern of food accessibility not follow the pattern of food availability. This means that the food accessibility is more dynamic to determine the food security pattern. Most of the blocks have poor accessibility. Analysis of individual indicators indicates the food accessibility pattern more clearly. Total pucca road length to per lakh of population indicate the physical access of food resources in the area. The high food secure blocks also have the good accessibility leads them to be more food secure in comparison to the other blocks. Chandaus, Dhanipur, Atrauli, and Gangiri have the 115.9%, 132.6%, 173% and 101.3% road accessibility which support that the good connectivity with other positive indicators have the profound impact on the food security pattern. Tappal has the lowest value for road connectivity and lies in the medium category while other blocks have medium and low value of road accessibility leading to negative impact on food accessibility with negative values of other food security indicators. Similarly other indicators like the percentage of workers and BPL families determine the economic access of food resources. The low concentration of BPL families in Chandaus, Lodha and Dhanipur indicates the more economic assets security to the population to purchase food. Similarly the high concentration of working population in Chandaus, Gangiri, Atrauli, Dhanipur results in high economic security and food accessibility in these blocks in comparison to other blocks.

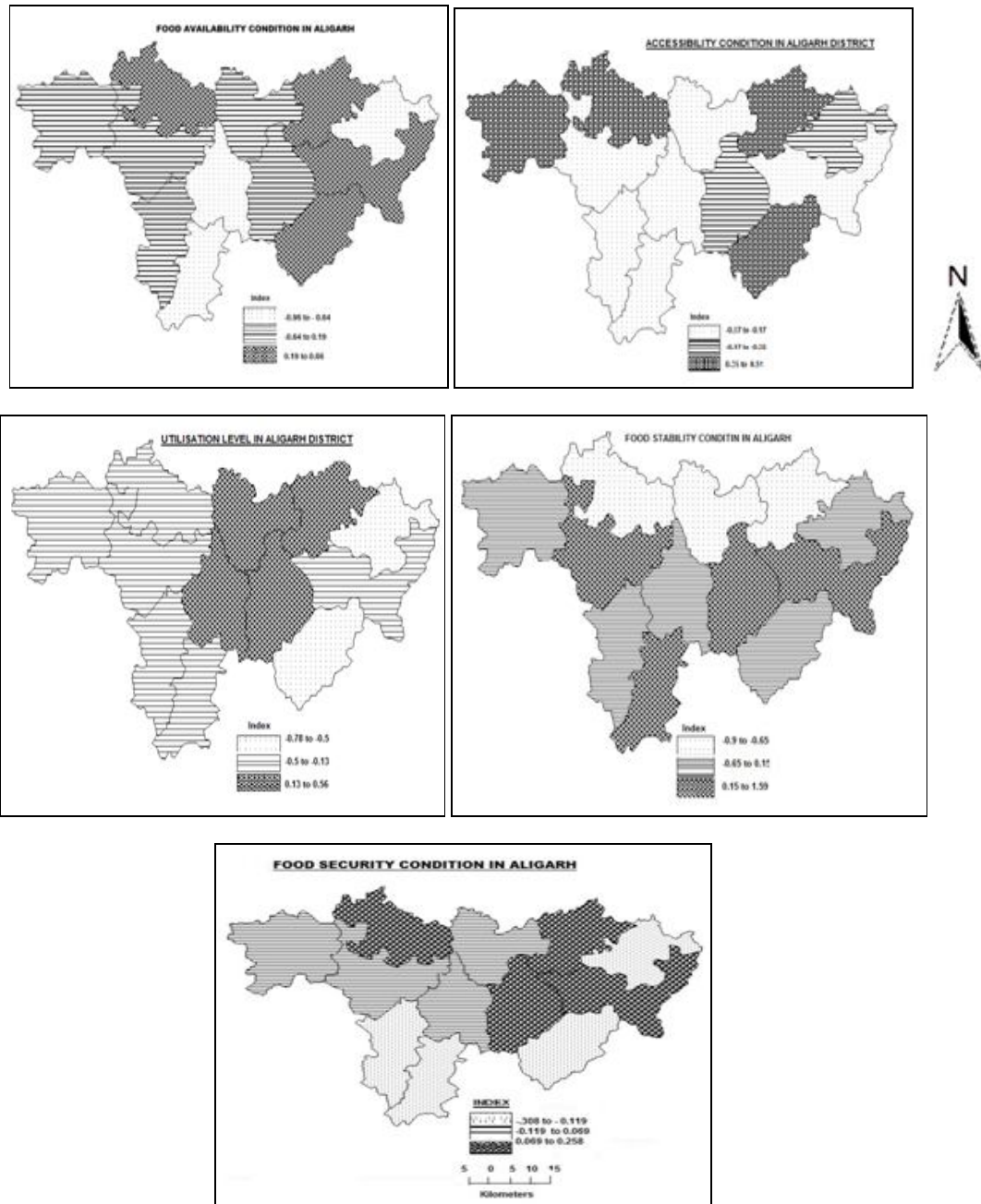
Food utilization indicators pattern also guide the distribution of food security in the district. The collective utilization indicators value shows that the Jawa, Lodha, Dhanipur, Atrauli blocks have high food utilization that also results in the overall high food security in Dhanipur and Atrauli and medium food security level in Jawa and Lodha. The number of PHC and hospital availability indicates the care and health infrastructure in the blocks and their high concentration in the Atrauli, Chandaus, Lodha, Jawa follow their food security status. Gangiri, Lodha and Atrauli have more than 30 percentage coverage area of hospitals within 5 km range that improves not only the food utilization but also the overall food security pattern in these blocks. Similarly the literacy rate is another important indicator of the food utilization. The gender disparity is found in the male and female literacy rates. The good female literacy in some blocks like Jawa, Lodha, Chandaus, Atrauli and Dhanipur results in the improvement in food security and food utilization pattern in these blocks in comparison to the other blocks that have low female literacy. No of anganwadi centres are one of the important infrastructural incentives to improve the food security pattern. Gangiri, Atrauli, Dhanipur, Jawa, Chandaus have more number of these centres and play an important role to improve the food security pattern in these blocks. The other factors like presence of social groups influence the women empowerment and awareness level among them. Khair, Dhanipur and Gangiri have the highest concentration of Mahila mandalas that helps to improves the female condition in these blocks that directly influence the food security pattern in these blocks and they correspondence the high and medium food secure blocks.

Food stability is another important dimension of the food security and the selected indicators like cold storage facility and godowns facility indicate the nature of resilience of the food security in the blocks. The composite index value of the food stability indicate that the Khair, Dhanipur, Iglas have the high level of infrastructure while Chandaus, Jawa, Atrauli are in low category.

The lack of mismanagement of individual dimension of food security in different blocks results in the variation of the food security pattern. Some blocks have high performance in availability like Chandaus, Atrauli, Gangiri and Akrabad but lacks in other dimensions and similarly some have good performance in accessibility but lacks in utilization and stability index. That's why there is an urgent need to focus on that dimension of food security in particular block in which it lacks. The perfect integrated blending of the all four dimension improves the overall food security pattern in the district. The food utilization performance should be strengthen and focused in policy matters to improve the food security. The overall food security pattern follows more

the pattern of food availability which indicates that in Aligarh food accessibility and utilization are on edge in performance to determine the food security pattern.

**6. Food Scurity Condition in Aligarh**



## 7. Block Wise Policy Measures

Block Name	Food Availability	Food Accessibility	Food Utilization	Food Stability	Food Security
Tappal	Medium	High	Medium	Medium	Medium
Chandaus	High	High	Medium	Low	High
Khair	Medium	Low	Medium	High	Medium
Jawa	Medium	Low	High	Low	Medium
Lodha	Low	Low	High	Medium	Medium
Dhanipur	Medium	Medium	High	High	High
Gonda	Medium	Low	Medium	Medium	Low
Iglas	Low	Low	Medium	High	Low
Atrauli	High	High	High	Low	High
Bijauli	Low	Medium	Low	Medium	Low
Gangiri	High	Low	Medium	High	High
Akrabad	High	High	Low	Medium	Low

Table 2

*Tappal*, inspite of having high food accessibility lies in medium category because it has medium food availability, medium food utilization, and medium food stability so to improve its food security policy should be focused to strengthen food availability, utilization and food stability factors like- infrastructure, health care and production resources.

*Chandaus* having high food availability, accessibility and medium food utilization so lies in the high food secure region. Focus on improving utilization and stability secure the further high sustainability of food security in the block.

*Khair* due to having medium food availability and medium utilization lies in the medium category. To improve its food security position sustainable efforts are necessary in all dimension.

High food utilization in *Jawa* ranks it in medium category inspite of having its medium performance in food availability and low accessibility and low stability. The priority area here are accessibility and availability resources and stability factors.

Similarly, *Lodha's* high performance in food utilization results in medium food stability here inspite of having its low performance in food availability, and accessibility. So, the integrated approach to food production and its access is necessary to improve the food condition of *Lodha* block.

*Dhanipur's* high performance in food utilization positively have multiplier effect on total food security pattern and it lies in the high food secure region with all other medium performance in availability and accessibility. The positive blending of the all factors performance results in overall high food security in the block. Though to continue its sustainability in high food security the better utilization and management of resources should be maintained.

*Gonda* have the high influence of low food accessibility and thus ranks in low food secure region inspite of medium performance in all other dimensions. So, here the economic assets and the high purchasing power must be infused by creating employment and other income generating resources.

*Iglas* have low food availability and low food accessibility results in overall low food security in the block. The medium performance in the food utilization should be harnessed and integrated with the improving food availability resources and food accessibility assets.

*Atrauli* is the best performing block among all the blocks with high performance in all three dimensions of the food security. Its high performance in food availability positively blends with high performance in food accessibility and food utilization that result in the overall high performance in the food security. Though, it needs to improve to food stability to maintain the high food security in sustainable manner.

*Bijauli's* low performance in the food availability and food utilization results in the overall low food security. Its medium performance in the food accessibility should be integrated with the improved food availability and food utilization that will help it to improve its food security condition.

*Gangiri's* high food availability and high food stability perfectly integrated with the medium food utilization and secure its high food security condition. The urgent need here is to improve the food accessibility resource creation. The improving food accessibility will result in high equitable access of food resources.

*Akrabad* have the influence of food utilization on the overall food security pattern. Its low performance in the food utilization results in low food security inspite of having high and medium performance in all other dimensions. So the need is to focus on health care and health infrastructure with improving social awareness among masses.

## 8. Conclusion

Food security analysis at block level indicates that the performance of blocks in individual's dimension of food security varies considerably. No block has the perfect combination in all four dimensions. The focus on the missing link of food dimension will help to improve the food security condition in the blocks. The better utilization and management of resources is necessary to maintain the sustainability and social just in the allocation of food resources. The holistic approach will help to improve the overall food security condition in the Aligarh district.

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