ASSESSMENT OF CALORIC AVAILABILITY IN JHARGRAM SUBDIVISION OF PASCHIM MEDINIPUR DISTRICT

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Keywords:

Caloric availability;

Nutritional status;

Man-land relationship;

Food security;

Regional development.

Abstract

Food is an essential part of any living being. For human beings the key factor which enables them to work efficiently is the calorie intake. In relation to the man-resource relationship, this paper highlights the status of caloric availability in one of the most backward regions of West Bengal in 2016. Being dependent on agriculture as an economic activity, Jhargram Subdivision of Paschim Medinipur has high population growth rate and associated negative results. In this set up it has been found that the available calorie is greatly controlled by calorie from agriculture. The north western part of Jhargram Subdivision shows low caloric consumption than its south eastern part. All the C.D Blocks fall under the national average of per capita kilocalorie per day, making all the blocks calorie deficit in nature.

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1. Introduction

There exists an intricate relationship between human beings and the resources available. Growth of population is a vital element in assessing the population resource nexus. But there exists a debate that whether high population growth or deficiency of resources can be held responsible for the man-resource imbalance. It is not always the deficiency of resources or high population growth that gives rise to population-resource imbalance. The pattern of social structure, the stage of technological development, the pattern of population distribution, government policies etc. sometimes become responsible for the nature of balance between the people and resources of any area [3]. Thus the number that a given piece of land can support does not only depend upon its territorial resources but also on a number of socio-econo-cultural and political conditions.Resource is something that is termed as something useful for the use of human beings by the human beings. So unless there is human interference the utility of resources remains very low.

In this aspect the population theory of T. R Malthus has opined that population grows exponentially while the food resources grow arithmetically which would result in a future when human beings have no resources to survive on [7].

Food is a resource which has the basic utility of providing energy to a living being. The ability of any region to support the population inhabiting it, is the main requirement in terms of starting any developmental initiative. A malnourished or hungry population cannot work as a human resource.

According to Shankar Subramanian and Angus Deaton a relationship has been established between percapita calorie availability and percapita total household expenditure. He outcome shows a correlation between the two variables where an increase in food expenditure is associated with increase in calorie consumption [10].

Decreasing purchasing power with the increase in prices of essential foods have adversely affected the food security leading to malnutrition in various developing countries of Asia [6].

Thus it can be said that lower calorie consumption is linked with malnutrition and associated lower purchasing power and increased prices of the food items. The present paper attempts to find out the pattern of calorie consumption in one of the backward portions of a highly populated district of West Bengal during 2016. The Study area of Jhargram Subdivision is characterised by economic backwardness and low cropping intensity [1]. So an enquiry has been made to identify the caloric availability in Community Development Blocks of this Subdivision and to highlight the causes related to a particular pattern present in the study area.
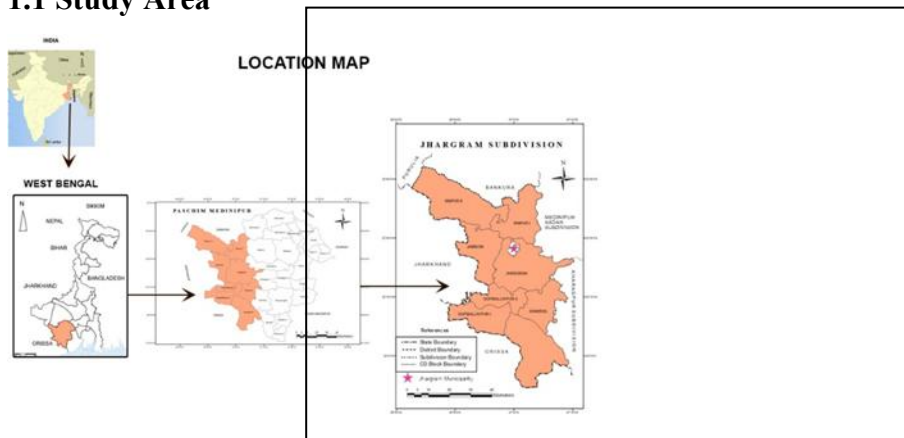
1.1 Study Area

Figure 1. *Map shoeing location of Jhargram Subdivision*

Jhargram Subdivision is located between 22°00′ N to 22°51′06″N latitudes and 86°32′30″E to 87°14′24″E longitudes. It forms the western part of Paschim Medinipur District. Jhargram Subdivision is surrounded by Orissa and Jharkhand towards its south-western and western part, Purulia District towards its north western part, Bankura District towards its north and Medinipur Subdivision and Kharagpur Subdivision towards its eastern and south eastern part respectively. Jhargram Subdivision consists of eight Community Development Blocks, namely, Binpur-I, Binpur-II, Gopiballavpur-I, Gopiballavpur-II, Jhargram, Nayagram, Jamboni and Sankrail and Jhargram Municipality [8]. These eight blocks contain seventy nine Gram Panchayats. The Subdivision has its head quarter at Jhargram. Jhargram Subdivision is situated among the hilly and rolling uplands of Chhotanagpur plateau and the undulating tract of *Rarh*Bengal. The geological formation of the area is mainly lateritic, which occupies the central as well as the southern parts of the area, while the eastern part is characterized by alluvium of Lower Ganga

Plain. The general slope of the area is from north-west to east south-east. There are three rivers (Kangsabati, Subarnarekha and Dulung) which drain the Subdivision from north-west to south-east. The area is one of the drought prone areas of Paschim Medinipur District. The climate is warm humid tropical in nature and falls under Koppen's Aw type of climatic classification. The vegetation of the Subdivision is dominated by jungles consisting of Shorearobusta (Sal) or by mixed forest where species of Alagia, Schleichera, Schrebera, Terminalia and similar trees with many shrubs and climbers are found [9].

2. Research Method

The present study has been done using mainly primary data and some secondary data. The caloric availability denotes the food supply available per capita for human consumption during a particular time period in terms of quantity, caloric value and protein and fat content. According to Organisation for Economic Co-operation and Development (OECD) in 2011 the average calorie consumed by an Indian is 2455 kilocalories per day. To get the data for calorie intake in different villages of Jhargram Subdivision, a primary survey has been done by the researcher to collect the information about the daily routine of intake of food, their types and quantity by the respondents. A total sample number of 300 has been selected on the basis of random sampling from each block of Jhargram Subdivision. To calculate per capita kilocalorie per day the following equation has been used –

$$\text{Kcal/capita/day} = \frac{\sum Kcal\ of\ food\ /day}{Total\ Population}$$

In this equation to calculate total kilocalorie of food per day the following formula has been used-

$$\text{Total Kcal of food/day} = \frac{\sum \{(F1*Cl1) + ...(Fn*Cln)\}}{1000}$$

Where,

F1= Food item 1,

Cl1= Calorie of food item 1,

Fn= n number of food items,

Cln= Calorie of nth food.

To calculate percapita kilocalorie from agricultural produce, the following steps are used-

Percapita Kcal from agricultural produce= $\frac{\sum Kcal\ of\ agricultural\ \ food\ crops}{Total\ Population}$

In this equation to calculate total kilocalorie of agricultural produce, the following formula has been used-

Total Kcal of agricultural food crops= $\frac{\sum\{(AC1*Cl1)+\ ...(Fn*Cln)\}}{1000}$

Where,

AC1= Agricultural food crop 1,

Cl1= Calorie of food crop 1,

Fn= n number of food crop,

Cln= Calorie of nth food crop.

To calculate the status of calorie deficit/surplus, the following formula has been used-

Calorie status= 2455- Available Kcal/capita/day

To identify the correlation between two variables Pearson's Correlation Coefficient formula has been used, which is as follows-

r = $\frac{n(\sum xy)-(\sum x)(\sum y)}{\sqrt{[n(\sum x^2)-(\sum x)^2][n(\sum y^2)-(\sum y)^2]}}$

Where,

r = Correlation coefficient

x = Independent variable

y = Dependent variable

All the calculated value are compiled and processed. Choropleth maps have been prepared using GIS to understand the spatial variation of the component. The available kilocalorie per day per capita demotes the status of nutrition that the region is getting. The positive value of calorie

status indicates deficit in calorie intake, while the negative value denotes surplus calorie intake from the national level.
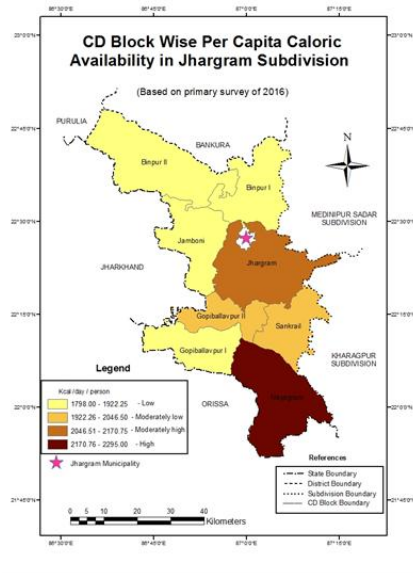
3. Results and Analysis

Figure 2. *Map showing percapita caloric availability*

Table 1. CD Block wise per capita caloric availability in Jhargram Subdivision

CD Blocks	Kcal / day / person
Jhargram	2082
Binpur I	1820
Binpur II	1798
Jamboni	1867
Nayagram	2295
Sankrail	1991
Gopiballavpur I	1822
Gopiballavpur II	1925

Source: Primary survey

From Figure 2 and Table 1it is found that in 2016 per head caloric availability is highest in Nayagram (2295 Kcal per person per day), while the lowest is 1798 kilocalorie which is found in

Binpur II. Gopiballavpur I, Jamboni and Binpur I have shown low calorie consumption per day per person. Gopiballavpur II and Sankrail have moderately low per capita caloric availability while Jhargram block has moderately high per capita calorie intake. It can be said that the north-north-western part of Jhargram Subdivision has low per capita calorie consumption, while the south-south-eastern part has greater per capita caloric availability.

To understand this spatial pattern of caloric availability, the author made an enquiry into the fact that whether there is any relation between calorie from food crop and the available calorie in Jhargram Subdivision.

Table 2. CD Block wise per capita caloric availability form food crops in Jhargram Subdivision

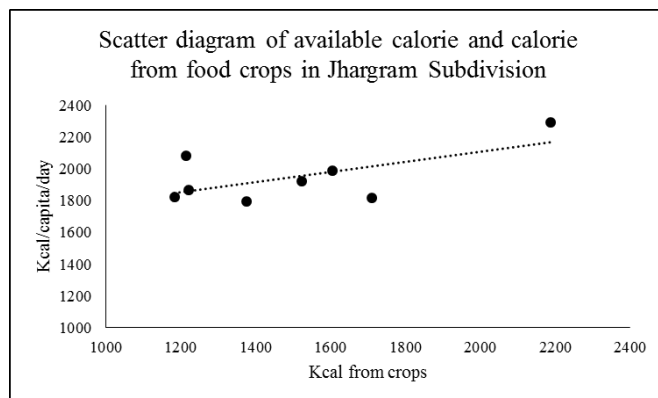| CD Blocks	Kcal fromAgricultural food crops
Jhargram	1213
Binpur I	1710
Binpur II	1375
Jamboni	1220
Nayagram	2188
Sankrail	1605
Gopiballavpur I	1183
Gopiballavpur II	1522

Source: Primary survey

Figure 3. *Correlation coefficient between x and y variables (r= 0.64)*

According to the correlation coefficient between the above mentioned variables the result indicates that there exists a moderately strong positive correlation between them. This means that wherever there is an increase in per capita calorie availability from agricultural produce, the total percapita kilocalorie has also increased. Although the nature of this positive correlation is moderately high (r=0.64). Figure 3 also conforms to this fact and shows a trendline which portrays an upward trend. Thus it can be said that calorie intake per day is moderately governed by the calorie from agriculture. This means that till date the nutritional aspect of Jhargram Subdivision is dependent on agriculture.

3.1 Deficit/surplus availability of calorie

The standard consumption of calorie by an Indian per day is 2455 kilocalorie. Based on this national average this section will find out the situation prevailing in Jhargram Subdivision in 2016. The values of the blocks higher than the national average will be considered as surplus regions while the blocks with values lower than the national average will be considered as deficit regions.
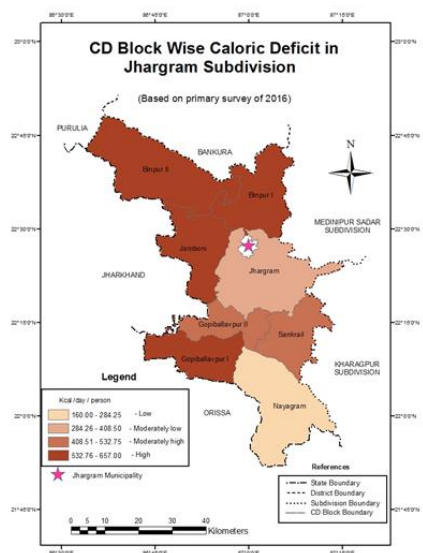

Figure 4. *Map showing caloric deficit in Jhargram Subdivision*

Table 3. Calorie deficit of Jhargram Subdivision

CD Block	Calorie deficit from national average in 2015-16 (calorie)
Jhargram	373.00
Binpur I	635.00
Binpur II	657.00
Jamboni	588.00
Nayagram	160.00
Sankrail	464.00
Gopiballavpur I	633.00
Gopiballavpur II	530.00

Source: Primary survey

From Figure 4 and Table 3 it is evident that all the blocks of Jhargram Subdivision fall below the national average of per capita calorie consumption. The national average itself is lower than the standard caloric requirement by each individual per day.

Given the situation in 2016, the highest amount of deficit can be found in Binpur II (657 Kcal), while the lowest deficit is found in Nayagram which is only 160 kilocalorie lesser than the national average. Jhargram Subdivision shows low deficit values, Gopiballavpur II and Sankrail show moderate deficit values. High amount of deficit values are found in Binpur I, Jamboni and Gopiballavpur I.

The northern and north-western part have greater deficit in per capita calorie compared to the other parts of Jhargram Subdivision. The overall deficit present in Jhargram Subdivision proves the fact that people are not getting enough amount of required calories from the food available. This situation can become a hindrance in developing the human resource of the area. People need food to function and if the proper calorie intake does not happen then that can lead to health hazards in near future.

4. Conclusion

From the analysis it is evident that people of Jhargram Subdivision donot get adequate amount of calorie. The blocks which have more agricultural produce tend to show more caloric input from agricultural crops. The overall caloric availability mainly depends on the calorie from agriculture. Moreover, all the C.D Blocks do not meet the national standard of per capita kilocalorie. Thus it can be said that either the purchasing power of the people is not good enough to buy required food items or a lack of information regarding the standard calorie requirement is prevailing in the study area. The hunger of the people is being taken care of but the important nutrients necessary for good health remain missing from the daily diet.

Nayagram is such a block in Jhargram Subdivision which shows highest amount of per capita calorie consumption per day, highest amount of calorie from agricultural produce and least amount of calorie deficit from national average. The probable reason for such a situation may be attributed to more aware population and better economic condition.

More attention should be paid to the north western part of Jhargram Subdivision which shows low caloric availability. According to the Human Development report of Paschim Medinipur, this part of the Subdivision is economically backward in nature with a considerable number of tribal population [4]. The literacy rate and per capita income are also considerably low in the north western part of Jhargram Subdivision [1]. Thus it can be said that low calorie consumption in this area is a result of backwardness. It is utmost necessary to take corrective measures to educate people of Jhargram Subdivision about the benefits of proper calorie consumption so that a better future can be achieved.

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