

Evaluation of Availability of Food in the context of Food security in Lakhisarai District

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Abstract: Food is an essential requirement of Man. Adequate food is necessary to be physically and mental active and good health. In a society where people do not have access to adequate food, malnutrition affects the efficiency of person, as well as social problem. It has also been said, 'Bubhukshitah kim na karoti papam'. Lakhisarai is an agricultural dominant district located in Middle Gangetic plain, with an area of 1286 km² and population of 100091 persons. Density of population is 778 persons per km². More than 80 percent of population is engaged in agriculture. Rabi crops are predominant in northern part of the district while there is good cultivation of paddy in southern part. In this research paper, an attempt has been made to test the availability of food and calories in the context of food security in Lakhisarai district.

Key Words: food security, caloric availability, food grain, demand of food, malnutrition.

1. INTRODUCTION:

Food is an essential requirement of Human beings. It is necessary to all for physical and mental health. The quantity and quality of food may vary from person to person but a certain amount of food required every day. Ensuring access of food to all individuals is always been challenging in developing countries like India. The concept behind Food security is that all individuals are a target of food could get the required quantity daily. The quantity and quality of food is directly related to the economic status of a person. Along with this influences of food habits, choice of person, education, food cooking methods also affects its quality. "Today where obesity is becoming a big problem in developed and developing both type of countries at same time about 795 million or 11.50 percent population of World does not get enough food¹. According to FAO about 195 million or 14.50 percent population of India is undernourished². Under these conditions it seems necessary that the availability of food or calories in Lakhisarai district should be tested in contest of food security. Demand of Food or Calories: "Calorie is a measure of energy unit supply by food articles, we consume"³. Calorie requirement makes sense of the amount required to meet the daily need of a person which is necessary to keep him physically and mentally fit. The total amount of calories a person needs each day varies, depending on a number of factors; age, sex, health, weight and level of physical activity. "On these FAO recommends 1400 to 2800 calories for different age and work group"⁴. "In India the Indian Council of Medical Research set up the various Nutrient Advisory Committee and recommended the dietary allowances of the various nutrients for the various age groups within the population. As per the ICMR reports a daily energy intake is recommended of 2400 kcal per person per day"⁵. Food Security: Food Security is a flexible concept. In 1974 World food summit, Food security is defined as: "Availability at all times of adequate World food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and price⁶. This definition has been accepted by FAO in 2001 with following revisions. "Food security is situation that exist when all people, at all time have physical, social and economic access to sufficient, safe and nutrients food that meets their dietary needs and food preferences for an active and healthy life."⁷ In other words Food security is depends on these three points:

Food availability - It means food must be sufficient for all. It shows production and stock of Grains in any particular region to capacity to transport food from any part of region for trade or welfare.

Food access- Food access shows the people should be able to require adequate quantity of food always by production, purchase or government subsidy.

Food utilization- This means everybody should get proper nutrition from the food eaten. This process involves cooking of food, storage process, clean drinking water, personal health and hygiene habits.

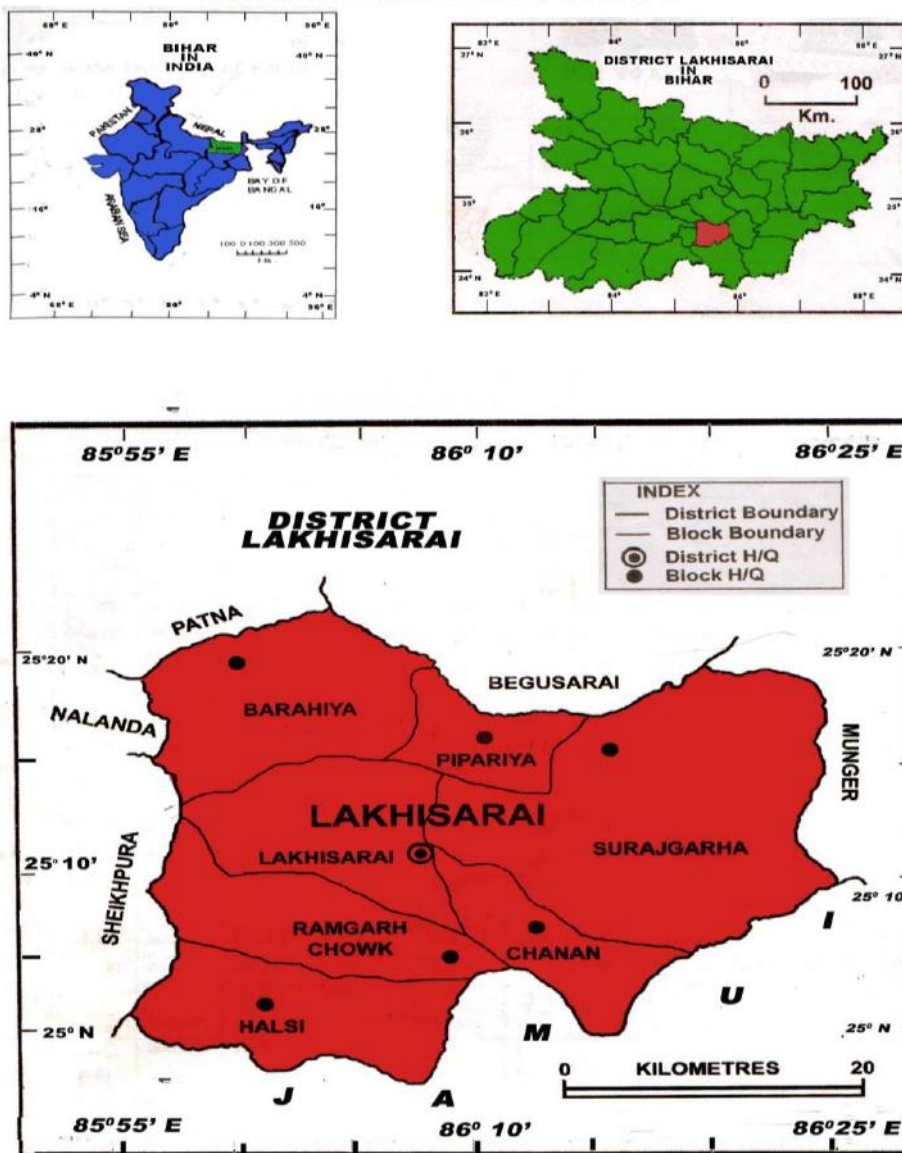
Food security is also related to person's income, socio-economic condition, education, agricultural growth and

2. Peaceful conditions:

STUDY AREA: Lakhisarai District of Bihar is a part of middle Gangetic plain. Lies between 25° North to 25°20' North latitude and 85°55' East to 86° 30' East longitude covers an area of 1286 km². It is bounded the by the district of Begusarai in the north by Munger in the east Jumui in south and districts of sheikhpura, Nalanda and Patna in the west. The northern part of the district is a fertile flood plain while western and southern part is an old alluvial plain and eastern part is a

hilly tract which is less fertile than the other two. According to 2011 census, the total population of district is 1000912 persons residing in 472 villages⁸. “Culturally Lakhisarai district is a transition zone between Anga and Magadh cultural regions”⁹. Since time in memorial Lakhisarai was an established administrative and religious centre during historical past. It was one of the important administrative and religious centre during the Pal dynasty. In present context Lakhisarai district which till the 1991 census was a part of Munger district as one of its subdivision, was elevated to the status of a district on 3rd July, 1994 by the Government of Bihar. The headquarter of the district and the subdivision is Lakhisarai. There are seven community blocks viz. Barahia, Lakhisarai, Pipariya, Halsi, Ramgarh chowk, Surajgarha and Chanan. Barahiya (Nagar panchyat) and Lakhisarai (Nagar panchyat) are the two Municipal Towns in the district.

LOCATION MAP OF LAKHISARAI DISTRICT



3. PURPOSE OF STUDY:

- To find out the per capita food and caloric availability in Lakhisarai district.
- To find out the adequacy of available calories in Lakhisarai district.
- How important is the availability of food and calories in relation to Food security.
- To find the variation at the Block level in the availability of food and calories.
- Give some necessary suggestions to ensure adequate food availability in Lakhisarai district.

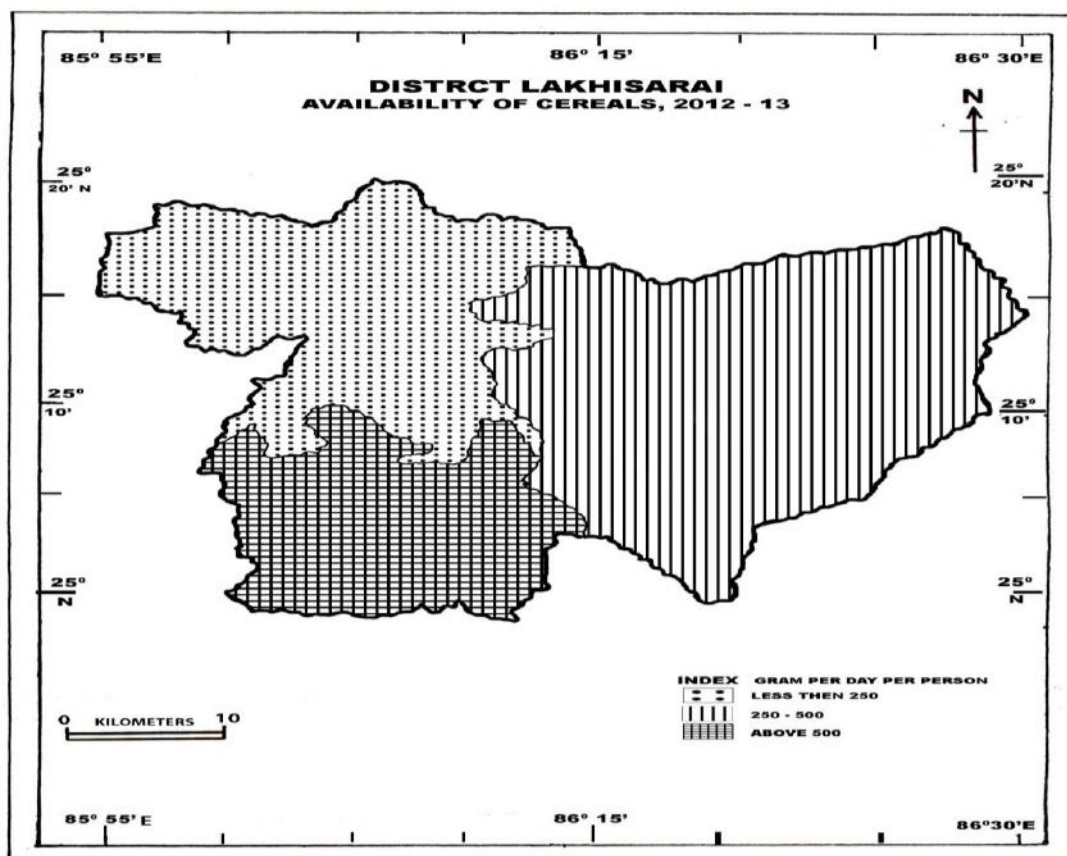
FOOD AVAILABILITY: In the context of food requirements, per head availability of food crops is more important than the regional disparity in the district. Therefore it is necessary to analyse the availability of food in relation to total

production so that an estimate of food grains availability can be made. This will also give an idea of regional imbalances in food production, per head availability as well as economic condition prevailing in the agricultural sector.

TABLE 1. DISTRICT LAKHISARAI : AVAILABILITY OF CEREALS 2012-13

BLOCKS	PADDY	WHEAT	MAIZE	TOTAL CEREALS	TOTAL POPULATION	PER HEAD SHARE KG/Y/P	PERHEAD SHARE GRAM/D/P
1	2	3	4	5	6	7	8
BARAHIYA	336000	6030000	2704800	9070800	128977	70.33	193.00
PIPARIYA	448000	3900000	2528400	6876400	51496	134.00	367.00
LAKHISARAI	5246430	5782000	2528400	13556830	221195	61.29	168.00
CHANAN	5602500	4200000	882000	10684500	107144	100.00	274.00
SURAJ GADHA	10881300	14868000	3939600	29688900	290998	102.00	280.00
HALSI	19125000	5075000	981960	25181960	115997	217.00	595.00
RAMGARH CHOWK	15750000	2900000	523320	19173320	85105	225.00	617.00
TOTAL	57389230	42755000	14088480	114232710	1000912	114.00	313.00

Source: Self calculated on the basis of FAO and Census of India.



CEREALS: Among cereals rice, wheat and maize are the major crop in the district, which constitute about 83.71 percent total production of the district. Table no. 1 shows per head availability of cereals at block level, in per head per year in kilogram and per head per day in gram. It is clear that the per head availability of cereals has varies at block level, it is highest in Ramgarh chowk with 225 kg per head per year or 617 gram per head per day followed by Halsi with 217 kg per head per year or 595 gram per day per head, Pipariya 134 kg per head per year or 367gram per head per day, Surajgadha 102 kg per head per year or 280 gram per head per day, Chanan 100 kg per head per year or 274 gram per head per day and Barahiya 70.33 kg per head per year or 193 gram per head per day and Lakhisarai 168 kg per head per year or 61.29 gm per head per day respectively.

PULSES –The production of pulses is very significant in Lakhisarai district. Pulses are the major source of protein in the dietary habit of our rural population. Next the caloric deficiency the rural population generally suffers from protein deficiency. The standard requirements of pulses 130 gram per head per day is considered adequate. The pulses production varies in different parts of district. Tal region and Diara land major producer of pulses so per head availability of pulses also varies block to block.

TABLE 2.DISTRICT LAKHISARAI : AVAILABILITY OF PULSES 2012-13

BLOCKS	LENTIL	GRAM	PEA	TUR	OTHER PULSES	TOTAL	TOTAL POPULATION	PULSES KG/P/Y	GRAM PER P/DAY
1	2	3	4	5	6	7	8	9	10
BARA HIYA	2835250	1633600	181250	510500		5292800	128977	41.00	112.00
PIPARIYA	515500	357350	97500	66100	76575	1113025	51496	21.61	59.22
LAKHI SARAI	515500	765750	75975	33050	412250	1802525	221195	.14	22.33
CHANAN	420000	287000	24500	99150	225500	1056150	107144	9.85	27.00
SURAJ GADHA	2835250	1888850	151950	148725	490000	5514775	290998	18.95	51.92
HALSI	425000	297500	25325	-	380000	1127825	115997	9.72	26.63
RAMGARH CHOWK	425000	212500	25225	-	308750	971575	85105	11.41	31.27
TOTAL	7971500	5442550	581825	79225	2403575	16878675	1000912	16.86	46.20

Source: Self calculated on the basis of FAO and Census of India.

It is clear from table no. 2 availability of pulses is highest in Barahiya with 41 kg per head per year or 112 gram per head per day followed by Pipariya 21.61 kg per head per year or 59.22 gram per head per day, Surajgadha 18.95 kg per head per year or 51.92 gram per head per day, Ramgarh chowk 11.41 kg per head per year or 31.27 gram per head per day, Chanan 9.85 kg per head per year or 27.00 gram per head per day, Halsi 9.72 kg per head per year or 26.63 gram per head per day and Lakhisarai 8.14 kg per head per year or 22.33 gram per person per day.

OIL SEEDS: Oil seeds constitute a great significant in Lakhisarai district. Very recent, they have acquired attention with the static production and subsequent decreases in area that has result a fall in per capita availability. Oil seeds are grown in both kharif and Rabi seasons. The important oil seeds grown in different parts in the district are mustard, sunflower, flex seeds and caster.

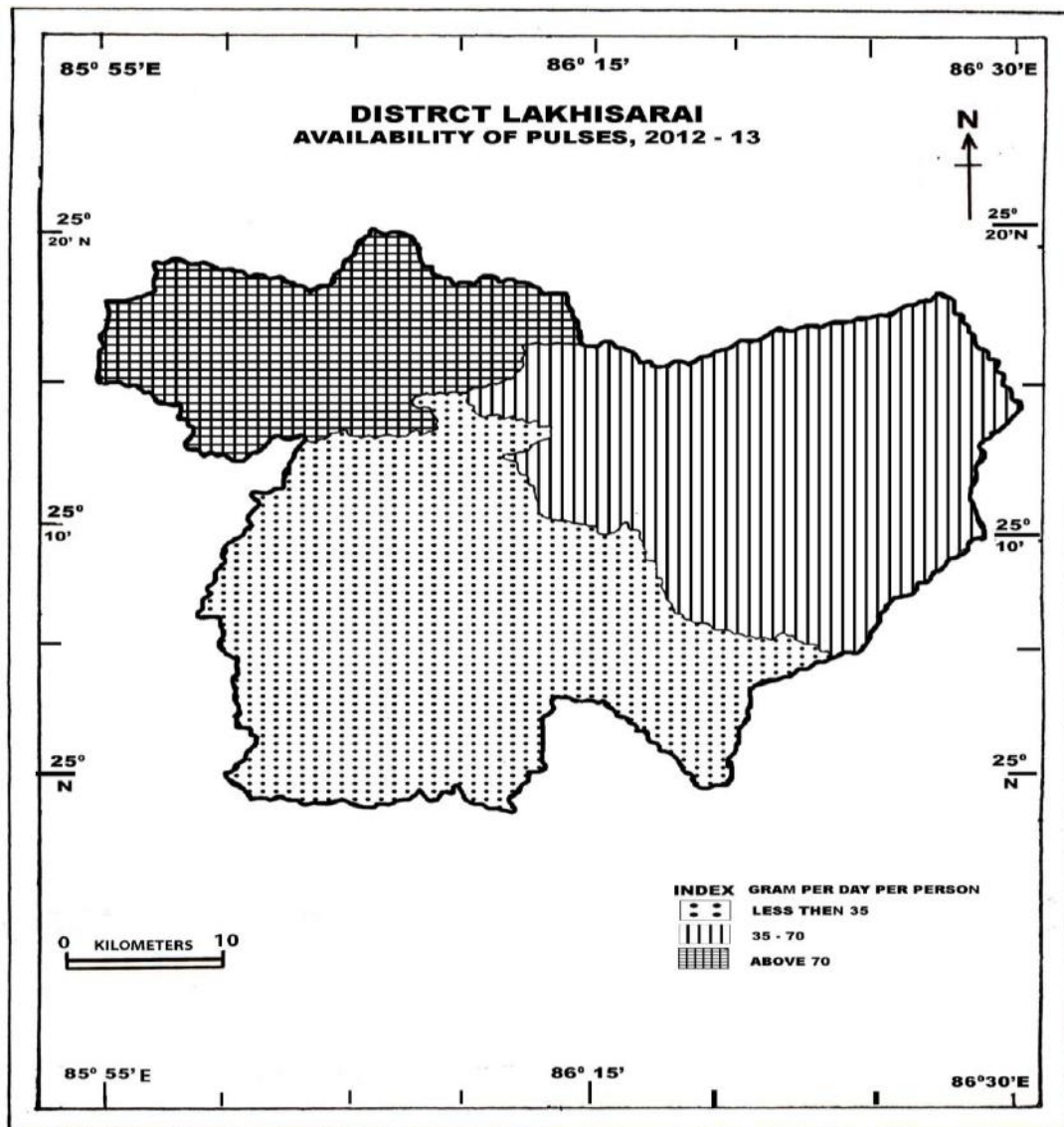


TABLE 3. DISTRICT LAKHISARAI: AVAILABILITY OF OIL SEEDS 2012-13

BLOCKS	MUSTARD	SUN FLOWER	FLEX SEEDS	CASTER	TOTAL OIL SEEDS	TOTAL POPULATION	PER HEAD SHARE P/Y/KG	PER HEAD SHARE P/D/GRAM
1	2	3	4	5	6	7	8	9
BARAHIYA	246600	39160	19600	4000	309360	128977	2.40	6.57
PIPARIYA	123300	21360	9800	8000	162460	51496	3.15	8.64
LAKHISARAI	61650	14240	9800	4000	89690	221195	0.41	1.12
CHANAN	127500	9968	9800	-	147263	107144	1.37	3.75
SURAJ GADHA		57672	29400	20000	384497	290998	1.32	3.62
HALSI	-	11392	9800	-	21192	115997	0.183	0.50
RAMGARH CHOWK	-	9256	9800	-	19056	85105	0.224	0.61
TOTAL	896475	169048	8000	6000	1133523	1000912	1.13	3.10

Source: Self calculated on the basis of FAO and Census of India.

Per head availability of oil seeds ranging highest in Pipariya block with 3.15 kg per person per year or 8.64 gram per person per day followed by Barahiya 2.40 kg per person per year or 6.57 gram per person per year day, Chanan 1.37 kg per person per year or 3.75 gram per person per day, Surajgadha 1.32 kg per person per year or 3.62 gram per person per day, Lakhisarai 0.41 kg per person per year or 1.12 gram per person per day , Ramgarh chowk 0.224 kg per person per year or 0.61 gram per person per day and Halsi 0.183 kg per person per year or 0.50 gram per person per day.

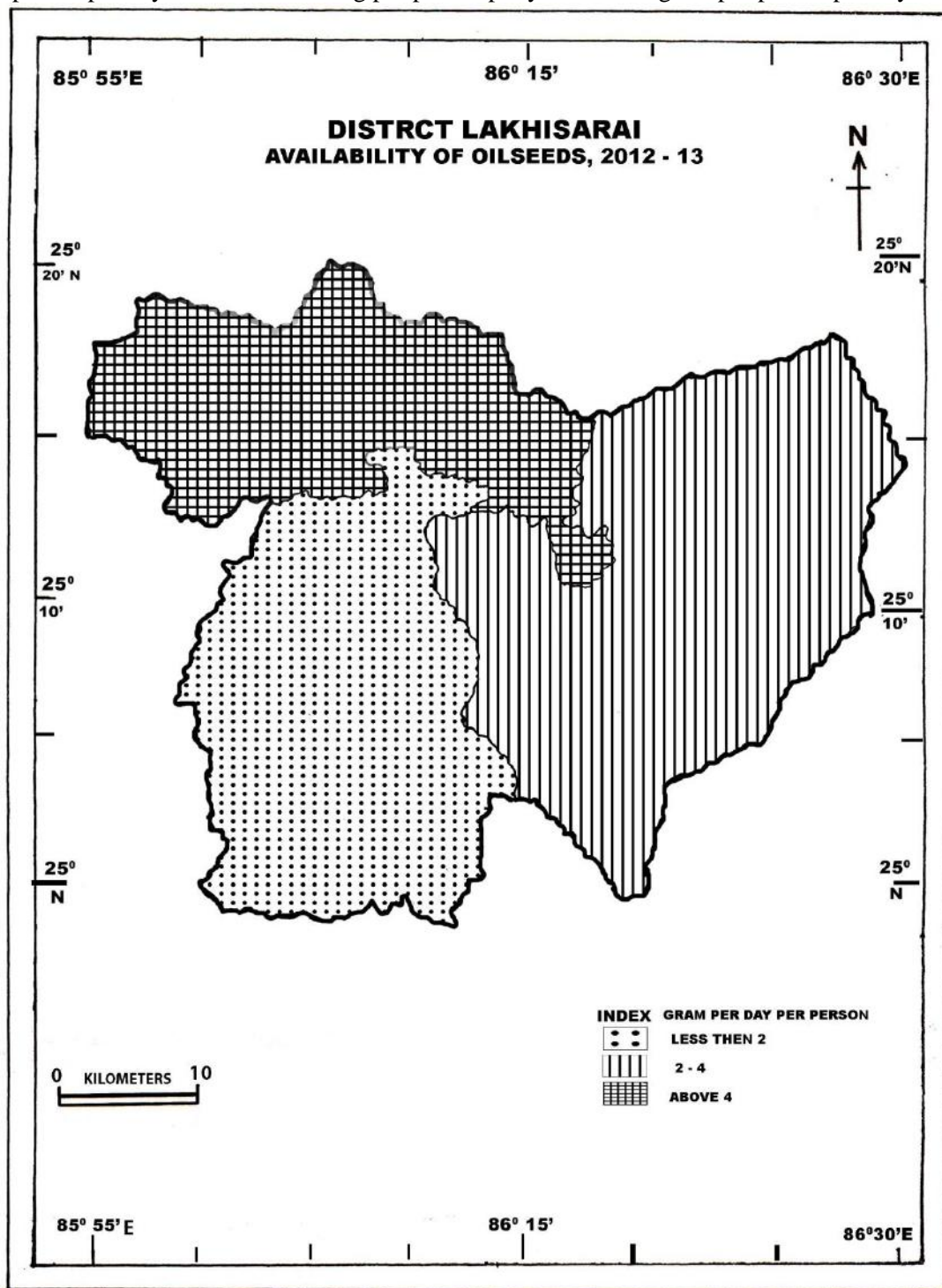


TABLE 4. METHOD OF CALCULATION THE CALORIC VALUE OF FOODS IN BARAHIYA BLOCK OF LAKHISARAI DISTRICT

CROPS	YIELD RATE (PER HEC.)	HARVESTED AREA (IN HEC.)	TOTAL PRODUCTION (IN KG)	STANDARD CALORIC VALUE (IN PER KG)	TOTAL CALORIC VALUE
PADDY	1120	300	336000	3450	1159200
WHEAT	2010	3000	6030000	3460	20863800

MAIZE	1176	2300	2704800	3420	9250416
TOTAL CEREALS	-	-	9070800	-	91273416
LENTIL	1031	2750	2835250	3490	9895022.50
GRAM	1021	1600	1633600	3490	5701264
PEA	1450	125	181250	3240	587250
TUR	661	200	132200	3350	442870
OTHER PULSES	1021	500	510500	-	1771435
TOTAL PULSES	-	-	5292800	-	18397841.5
TOTAL FOODGRAIN	-	-	14363600	-	49371257
MUSTARD	1233	200	246600	6680	1647288
SUN FLOWER	712	55	39160	6640	260022.40
FLEX SEEDE	980	20	19600	6610	129556
CASTER	800	05	4000	6610	26440
TOTAL OIL SEEDS	-	-	309360	-	2063306
VEGETABLE	12000	55	660000	2750	1815000
TOTAL	-	-	15332960	-	53549563.90

TABLE 5. DISTRICT LAKHISARAI : CALORIC PRODUCTION OF CROP GROUPS 2012-13

BLOCKS	CEREALS	PULSES	FOOD GRAINS	OILSEEDS	VEGETABLES	TOTAL CALORIC PRODUC.	TOTAL POPULATION	PER HEAD AVAILABILITY
1	2	3	4	5	6	7	8	9
BARAHYA	31273416 (58.40)	18397841.50 (34.36)	49671257.50 (92.76)	2063306.40 (3.85)	1815000 (3.39)	535495639.00 (100.00)	128977	1137.49
PIPARIYA	23686728 (80.00)	3849296.80 (13.00)	27536024.80 (93.00)	1083132.40 (3.66)	990000 (3.34)	296091571.50 (100.00)	51496	1575.28
LAKHISARAI	46753031.50 (84.82)	62589460.50 (11.35)	53011978 (96.17)	624033.60 (1.13)	1485000 (2.69)	551210116.00 (100.00)	221195	682.73
CHANAN	23798265 (80.86)	3661447.50 (12.44)	27459712.50 (93.30)	982665.50 (3.34)	990000(3.6)	294323780.00 (100.00)	107144	
SURAJGADHA	102457197 (82.65)	16133957.40 (13.00)	118591154.40 (95.65)	2562675 (2.07)	2805000 (2.26)	1239588294.44 (100.00)	290998	1167.06
HALSI	86899053.20 (94.51)	3922178 (4.27)	90821231.20 (98.78)	140420.90 (0.15)	990000 (1.08)	919516520.80 (100.00)	115997	2171.80
RAMGARH CHOWK	66161254.40 (94.30)	3378290.50 (4.82)	69539544.90 (99.18)	126237.80 (0.18)	49500 (0.17)	701607827.40 (100.00)	85105	2258.63
TOTAL	394107745.10 (83.71)	59580941.50 (12.65)	453688686.60 (96.36)	7556031.70 (1.60)	9570000 (2.09)	4708147183.20 (100.00)	1000912	1288.72

Source: Self calculated on the basis of FAO and Census of India.

On the basis of table no. 5 Cereals contribute 83.71 percent in total caloric production. At block level share of cereals is highest in Halsi with 94.51 percent followed by Ramgarh chowk 94.30, lakhisarai 84.82 percent surajgadha 82.65 percent, chanan 80.86 percent, Pipariya 80 percent and Barhiya 58.40 percent. It is clear from table no. 5 the share of cereals is 80.00 or above in six blocks out of seven. Only one block namely Barahiya shares 58.40 percent. Barahiya is located in Tal region where pulses, mainly lentil and gram are dominant in Rabi season, while Halsi and Ramgarh chowk share above 90 percent, where paddy is the most important crop in kharif and wheat is in Rabi.

PULSES: Pulses are the second major source of calories in district. It shares 12.65 percent out of total caloric production. But its distribution is not equal in all seven blocks. At block level Barahiya is the major producer of pulses, gain 34.36 percent calories from pulses followed by pipariya 13 percent, Surajgadha 13 percent, Chanan 12.44 percent, Lakhisarai 11.35 percent, Ramgarh chowk 4.82 percent and Halsia 4.27 percent. It is clear from table no. 5 the caloric production of pulses is very weak in Halsi and ramgrh chowk, where pulses are additional crop. Yields after paddy then its productivity is not good.

FOOD GRAINS: Food grains are the major source of caloric production, contributes 96.36 percent in total caloric production of the district. In lakhisarai caloric production from food grains is above than 90 percent in each block which indicates the traditional farming and lack of cash crops in district. At block level Ramgarh chowk shares 99.18 percent calories from food grains followed by Halsi 98.97 percent, Lakhisarai 96.17 percent, Surajgadha 95.65 percent, Chanan 93.30 percent, Pipariya 93.00 percent and Barahiya 92.76 percent.

OIL SEEDS: Oilseeds are the minor source of caloric production in district. Its grown as a cash crop, dominant in Tal and Diara land. In Bangar plains only Chanan shares more than three percent caloric production from oilseed. Other blocks like Halsi, Ramgarh chowk and Lakhisarai earn vary low caloric production from this. At block level Barahiya ranks first with 3.85 percent calories from oilseeds followed by Pipariya 3.66 percent, Chana 3.34 percent, Surajgadha 2.07 percent, Lakhisarai 1.13 percent, Ramgarh chowk 0.18 percent and Halsi 0.15 percent.

VEGETABLES: Vegetable has very insignificant share in the production of calories for food. About two percent of caloric production comes from its. Out of seven blocks tow namely Halsi and Ramgarh chowk get below two percent of their calories from vegetables. Other two blocks namely Lakhisarai and Surajgadha obtain between 2 to 3 percent and two blocks Barahiya and Pipariya get more than three percent of their calories from vegetables. The little contribution in the available gross calories of the block may be ascribed to the very small acreage devoted to their cultivation, partly due to low living standard, dearth of urban market bad connectivity of transport facilities in villages and lack of artificial irrigation. But with the ongoing regional development, it is expected that per capita caloric availability from vegetables may improve than the present merge average.

AVAILABILITY OF CALORIES: Table no.5 shows the availability of calories in Lakhisarai district. Presently at production level 1289 calories per person per day is available, which is 1111 Calories less then the recommended level 2400 calories. But the availability is not uniform in all blocks. The variation may be accounted to the population density, crop productivity and cropping pattern. The analysis indicates that any block does not getting per capita per day calories than the recommended allowances. The maximum caloric availability is reported in Ramgarh chowk 2258 calories per person per day followed by Halsi 2172 calories, Pipariya 1175 calories, Surajgadha 1167 calories, Barahiya 1137 calories, Chanan 752 calories and Lakhisarai block 683 calories respectively.

CALORIC AVAILABILITY ZONES: The spatial dimension of the caloric availability is demonstrated in table no. 6. It presents the true prospective of the caloric availability of blocks. Blocks of district Lakhisarai are classified into three groups of caloric density; High deficit caloric availability zone, Moderate deficit caloric availability zone and Low deficit caloric availability zone.

TABLE 6. DISTRICT LAKHISARAI: CALORIC AVAILABILITY ZONES

CALORIC AVAILABILITY (PER PERSON PER DAY)	BLOCKS	PERCENTAGE OF TOTAL POPULATION	ZONES
LESS THAN 1000	LAKHISARAI, CHANAN	33.00	HIGH DEFICIT CALORIC AVAILABILITY ZONE
1000 – 2000	BARAHIYA, SURAJGADHA, PIPARIYA	47.00	MODERATE DEFICIT CALORIC AVAILABILITY ZONE
ABOVE 2000	HALSI, RAMGARH CHOWK	20.00	LOW DEFICIT CALORIC AVAILABILITY ZONE
TOTAL	-	100.00	-

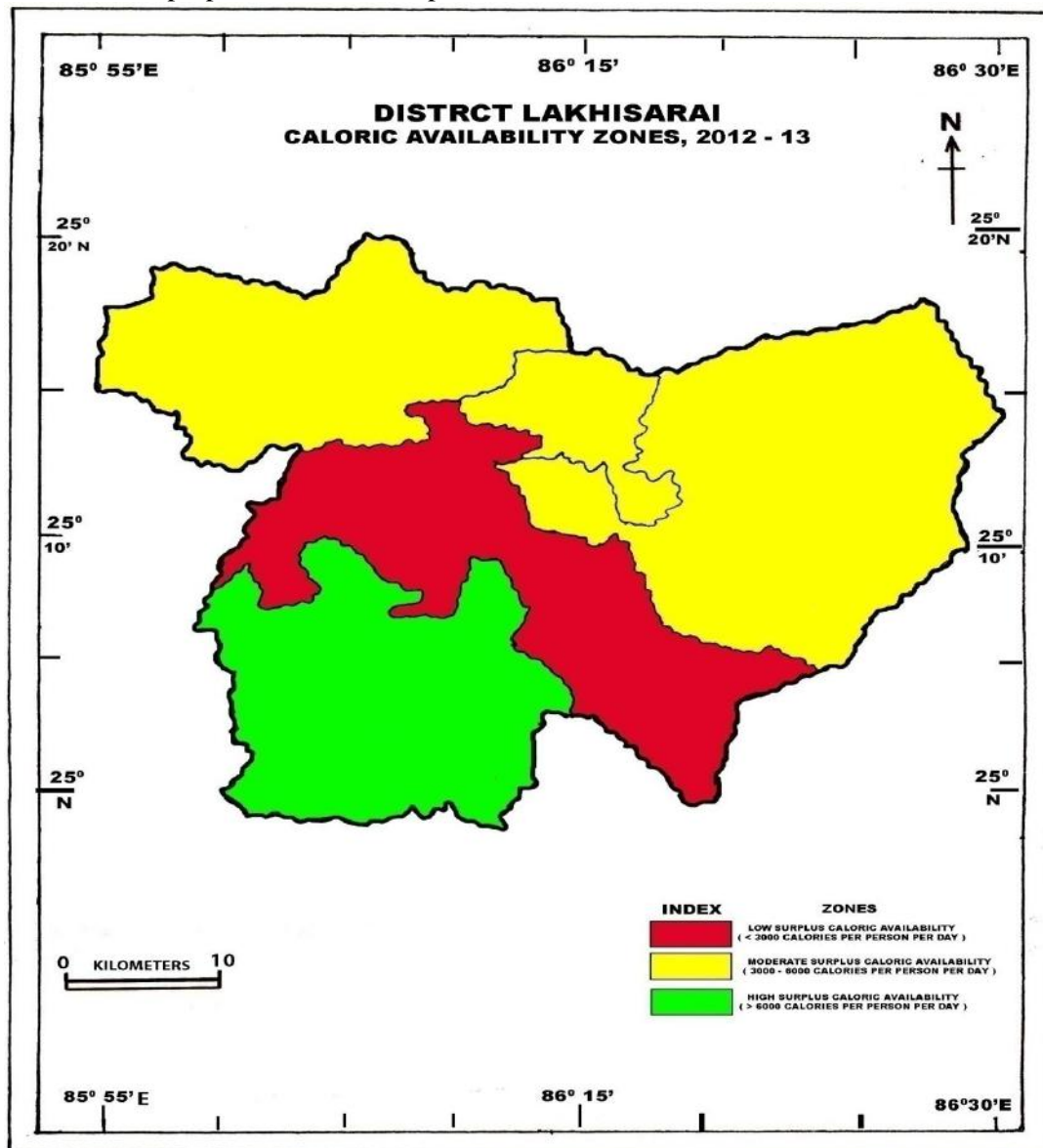
Source: On the basis of table no.5

High deficit caloric availability zone: Two blocks Lakhisarai and Chanan supporting about 33 percent population of the district recorded high deficit caloric availability. Per person per day availability of calories is 683 in Lakhisarai and 753 calories in Chanan which is less than 1717 calories or 71.54 percent and 1647 calories or 68.62 percent from recommended level 2400 calories. Lakhisarai block recorded high density of population while Chanan block is in hilly part of the district. In these two blocks irrigation facilities are weak and red yellow soil is less fertile then others blocks like Barahiya and Pipariya.

Moderate deficit caloric availability zone: Three blocks Barahiya, Surajgadha and Pipariya recorded moderate deficit caloric availability carry about 47 percent population of the district. Per person per day availability of Calories in

Barahiya is 1137 Calories, Surajgadha 1167 Calories and Pipariya 1575 calories, which is less than 1263 calories or 52.62 percent, 1233 Calories or 51.37 percent and 825 Calories or 34.37 percent from the recommended level of 2400 Calories. These blocks are in Tal and Diaraland related to fertile Khadar soil career of good production of Wheat, Maize, Pulses and Oilseeds. But water logging is the major problem in this area downs the Cropping intensity.

Low deficit caloric availability zone: Two blocks Halsi and Ramgarh chowk recorded low deficit caloric availability carries about 20 percent population of the district. Per person per day caloric availability in Halsi is 2172 calories and in Ramgarh chowck is 2259 calories are less than 228 Calories or 9.50 percent in Halsi and 141 Calories or 8.87 percent in Ramgarh chowk is very close to recommended level 2400 calories per person per day. These two blocks are major producer of paddy in district. It is also related to high proportion of Net sown area, high cropping intensity, artificial irrigation facilities and low proportion of Cash crops.



3. SUGGESTIONS:

- There is a need to increase cropping pattern to increase in food production.
- Such HYV seeds should be used that can produce in the shortest time possible so that more crops can be grown in a cropping year.
- There is a need to develop the irrigation facilities, especially in Chanan and Lakhisarai blocks, which can increase agricultural productivity and finally increase in food availability.
- Water logging is a major problem in Diaraland and Tal areas. It needs to be removed so that double and triple cropped area can grow.
- Pulses are the important source of protein of the people of lakhisarai district. But its share is only 12.65 percent in total food production. Production of pulses should need to be increased immediately.

- The carrying capacity of land in a area can not be increased beyond a certain limit. Therefore, it is necessary to control the rapid growth of population in long term planning.

4. CONCLUSION:

In this presented paper, an attempt has been made to understand the availability of food in the context of Lakhisarai district. The availability of Cereals per person per day is 313 grams, Pulses 46 gram and Oilseeds 3.10 gram in district. Caloric value of the total production of the district is 4708147183 Calories and per person per availability of is 1289 Calories which is 111 Calories less then the standard 2400 Calories per person per day recommended by ICMR. There is a need to increase in cropping intensity and production in order to get enough food. It is necessary to rid of the problem of water logging in the northern part and develop irrigation facilities in southern part of the district. At same time, the growth of population also needs to be controlled.

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