Dietary Deficiency Disease: Causes and Effects- A Case Study

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Abstract: In different ecosystem the Production of diversified food items are related to large numbers of nutritional deficiency diseases. The diversified cropping pattern- ecological zones are less prone to deficiency diseases as compared to the regions dominated by only one or two food grain crops. Here, an effort has been made to concentrate on nutritional inadequacy in South Haryana, including its causes and effects. For normal growth, development, and maintenance throughout life, a sufficient and balanced diet is crucial. Yet, in general, everyone is getting enough food, albeit there is undoubtedly a food shortage in the study region. As the nutritional intake is related to variety of food items so the study area should be less prone to nutritional deficiencyThe diets of the study area's residents include a balanced amount of both energy and caloric value meals; however they are deficient in micronutrients. "To alleviate nutritional issues, crop diversification and fertilisation of all nutritional requirements are essential"(Akhtar, R.1978). In order to reduce human hunger, a holistic approach involving the creation of connections between agriculturalists, nutritionists, and policymakers is urgently required. Local production is crucial for the availability of various nutrients and energy-dense foods in traditional dietary systems. Thus, the south Haryana, which is thought of as being a part of agriculturally affluent states, was specifically chosen for in-depth examination. The questionnaire was administered to randomly selected subjects / family and identified the nutrition level, prevalent deficiency diseases and possible causes and consequences in South Haryana.

Key words: Nutrition, Deficiency Diseases, Nutritional status.

Introduction: The study area's primary source of food and livelihood is agriculture. "One of the main issues in developing countries is nutritional insufficiency. This has a negative impact on rural residents' health and increases their risk of morbidity and mortality from infectious diseases. As in our country, where the majority of people have nutritional issues and where more than 3/4 of the population directly depends on agriculture for their subsistence"(*Agarwal, S.K.1986).* It is a known truth that a significant contributing factor to malnutrition in developing

nations is the scarcity of food (Tiwari, 1997) are likely to suffer greatly as a result of the condition. Thus, it is becoming more crucial to examine agricultural techniques with a focus on food supply and nutrition.South Haryana, which is more agriculturally prosperous and is located in the Indo-Gangetic plain, has been chosen to examine the causes and effects of nutritional deficiency disorders. The research region consists of six districts in south Haryana, where approximately 75% of the population works in agriculture. "The two main crops are wheat and bajra. In Haryana, Rabi and Kharif are the two important seasons for planting crops"(*Coppock, J.T.1964)* . Jowar, bajra, maize, cotton, and sesame are the main crops grown in the Kharif season. Wheat, gram, rapeseed, and mustard are the main crops grown during Rabi. 79% of the territory is cultivated, making up about 72.48% of the arable land. Through the use of substantial canal infrastructure and tube wells, almost 58% of the region is irrigated. "The research area is characterised by different farming patterns with only a very small amount of horticulture, which has an impact on the availability of diversified food sources and leads to nutritional deficiencies and a variety of deficiency disorders"(*Bhagat R.B.1999)*. "The assumption behind the research area's selection is that traditional agriculture will be practised there in the absence of adequate irrigation facilities"(*Azad, R.N.1975)*. It was found that because the research area is completely self-sufficient in the production of food grains, "the degree of difficulty is lower when the total food production is split by the total population" (*Aykroyed, W.R. 1971)*. However there are differences in land holding sizes. About 30% of all households are insufficient producers, though this number varies by area. "Regarding diseases caused by a lack of nutrition and people's overall health, there is a rise in difference between regions"(*Basir, O. 1962)*. It is suggested that in order "to boost the purchasing power of farmers and the rural people as well as the nutritional content of the dietary system, horticulture crops should be introduced rather than placing an excessive emphasis on food grain crops" *(Ayyar, M.P.1969)*.

Study Area: Many factors had a role in the study's decision to focus on this particular area. The research area is situated between a region of Haryana state that has excellent agricultural conditions and is almost north of the Thar Desert and the Aravali range. Second, there hasn't been much research done in the subject up to now. Thirdly, the study area has a divergent pattern of cropping. Fourthly, it is still dealing with the issue of starvation despite having previously been a part of the region that smelled the green revolution. Above all, the researcher's long-standing ties to the region as a native have inspired him to take on this project.

Objective: 1. To determine the prevalence of deficiencies and malnutrition and to evaluate the nutritional status.

2. To link nutritional deficiencies to illnesses and malnutrition.

3. To evaluate the main factors that contributes to and worsens deficient illnesses.

4. To pinpoint factors and offer workable solutions for enhancing nutritional and health status.

Hypothesis: 1.The hypothesis behind the study is that rural population has sufficient quantity of food but lacks in quantity of food hence they suffer with various deficiency diseases.

2. Malnutrition and deficiency illnesses are intimately correlated with inadequate nutritional intake.

3. Crop diversity can raise the area's nutritional standard.

4. Morbidity and death are strongly correlated with deficiency diseases.

Data Source and Methodology: Since published data on the frequency and causes of dietary disorders are typically not available at the micro level, survey research is preferred in this study. "The fundamental challenge in conducting a field survey is to gather as many representative data points (village) and other data units (respondents) from each stratum as feasible, in order to accurately capture the nutritional problem as it affects the entire population"(*Gomez, F. Galvan, R.R., Cravito, J.M. and Frank, S.1955).* Procedures for stratified random sampling were used to get the necessary data. The crop combination region of the study area served as the source for the selection of data points and other data units. There are three distinct crop combinations in the research area (South Haryana). "The assumption is that the crop combination region serves the overall objective of regional homogeneity in dietary practises, physical characteristics, and cultural factors, and thus serves as the first step towards the scientific selection of best representative tehsil to reflect a gradient in the varied agricultural conditions"(*Gopalan, C.1972).* It won't be possible to practice in all of the villages of the tehsil due to time and financial constraints. "But, by integrating a small number of communities, a deeper connection, trust, and rapport can be built, leading to the generation of more precise and dependable data"(*Izhar, N. 1978).* Hence, by taking into account the size (1500–2000 inhabitants) and a distance of at least 15 kilometres from the town.(Table-1) One village from each tehsil was selected randomly . Further ,complete village wise house list have been prepared and categorized in four different parts i.e. (i) Large farmer (above 10 acre) (ii) Medium farmer (5 to 10 acre) (iii) Small farmer (below 5 acre) and (iv) Non-cultivating families. In order to reflect the majority of the socioeconomic and cultural groups in the village, random samples of at least 10% of homes were employed to choose the data units. The current study is a pilot survey that is based on primary data collected by scheduling interviews with family heads and family members of the sample households.Total 223 household have been surveyed by oral questionnaire method from four representative villages. To discover deficiencies diseases for their betterment and health

improvement, questions on food habits and health elements were asked. "The daily dietary survey-based weighment method has been taken into consideration for the accurate results of the nutritive elements and the probable deficiency disorders as the balanced sheet approach is not acceptable and appropriate for the assessment of daily food intake data per head"(*Jelliffee, D.B.1966)*. "Members of a specific household were clinically evaluated, and any obvious signs of a well-defined deficiency condition or other disorders were noted and classified with the assistance of a skilled physician. Also, data on households' socioeconomic standing and eating habits were gathered"(*Jelliffe, D.B. and Jelliffe, E.F.P.1960)*.

"The analysis of deficiency diseases will be divided into two main categories: first, the diseases that most frequently result from a sustained lack of nutrition in the diet, and second, the illnesses that are primarily caused by deficiency and are made worse by it"(*Sukhatme, P.V. 1965)*. In order to correlate nutritional intake with the deficiency disease in the study area, it was deemed worthwhile to conduct a thorough field investigation of dietary habits and related diseases. To obtain trustworthy and authentic data and information, the village economy was studied by dividing the households based on the size of land holding, and sample households from each unit was surveyed. "A solid foundation for the relationship between morbidity and mortality and real nutrient intake will be provided by the identification of deficient disorders that are common in rural populations"(*Tiwari, P.D. 1997)*. The food consumed by the chosen households was evaluated for three consecutive days (using the weighing survey method) to determine the average consumption pattern in order to measure the dietary intake pattern of the research area. "Dietary standards enable us to identify nutritional deficiencies and surpluses that have a direct impact on growth and development. So, the assessment of a nutritional issue appears to be greatly aided by the symptoms of prevalent deficiency diseases. Finally, a correlation between the deficient disease symptoms and other common illnesses in the research area was established"(*Waterloo, J.C., Bulgaria, R. Keller., Lane, J.M. Nichaman, M.Z. and Tanner, J.M.1977)*.

Table-1

Selected Villages with Population, Nearest Town, and Selected House Hold 2012-13

Sr. No.	Zone	District	Tehsil	Selected village	Nearest town with distance in Km.	Population	Household	Selected Households				
								Large Farmer	Medium Farmer	Small Farmer	Agriculture Labourer	Total
	SOUTHERN ZONE	Bhiwani	Tosham	Birola	Tosham – 18	2196	368	11	15	18	13	57 (15.49)
		Rewari	Kosli	Surehli	Kosli – 15	2699	365	12	14	17	13	56 (15.34)
		Mahendergarh	Narnaul	Tajpur	Narnaul – 21	2472	338	10	13	16	13	52 (15.38)
		Gurgaon	-	-	-	-	-	-	-	-	-	-
		Faridabad	Palwal	Kolwaka	Palwal – 16	2539	375	12	14	18	14	58 (15.47)
		Mewat	-	-	-	-	-	-	-	-	-	-
		Total	-	-	-	9906	1446	45	56	69	53	223 (15.42)

Source: Statistical Abstract of Haryana 2011 and Field work

Note: Figures in parenthesis are the percentage of total household

Causes of Nutritional deficiency diseases: *"*The importance of health as a factor in social development is widely acknowledged. It is essential to the process of achieving national development"(Malik,P.K. 2004). Nothing may be deemed to be of greater relevance in terms of resources for socioeconomic growth than the wellbeing of the populace. Hence, the malnutrition problem is one of the major issues in developing nations due to its widespread incidence and high morbidity and mortality rates..(Table -2) "Tragic human consequences and negative effects for economic growth are included"(McCarisson, R.1936). Around a billion people worldwide have chronic under nutrition, according to a report given to the World Food Council in October 1989. South-east Asia, Africa, and the Indian subcontinent account for more than three-fourths of the world's malnourished people (Robinson, 1982). In impoverished nations, protein calorie malnutrition is frequently the direct cause of death (Lesi, 1978). The high fatality rate is a direct or indirect result of malnutrition. Due to its effects on the rate of economic development, the malnutrition issue is a major concern in emerging nations. Given the size of the issue, careful consideration should be given to determining its prevalence, precise root cause, and workable solutions.

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Table – 2
Ranking of Deficiency Disease in the Selected VILLAGES AND Morbidity and Mortality Rate

2012-13

Sr. No.	Village	Ranking of Disease					Percent of Morbidity to the Total Population	Percent of Mortality to the Total Population
		Ist Rank	IInd Rank	IIIrd Rank	IVth Rank	Vth Rank		
1	Birola	PEM	Vit. A	Vit.C	Vit. B	Misc.	10.8	13.5
2	Surehli	Vit. A	PEM	Vit. B	Vit.C	Misc.	7.5	9.5
3	Tajpur	PEM	Vit. A	Vit.C	Vit. B	Misc.	10.6	14.3
4	Kolwaka	PEM	Vit. B	Vit.C	Vit.A	Misc.	16.9	16.3
	Overview of Study area	PEM	Vit. A	Vit. B	Vit.C	Misc.	15.3	12.4

Source: Field Survey

The lack of nutrients in the body is referred to as a nutritional deficit. The food we eat on a daily basis performs multiple functions. First, it fuels the human machine. Second, it is necessary for body development, growth, repair, or regeneration of the physical body, including reproduction. Third, it preserves an appropriate environment for the body's biochemical processes. If the meal does not fully fulfil these requirements, the body's metabolic process becomes disordered, the body's transformation becomes deranged, and structural abnormalities arise in the body. As a result, around 75% of Indians reside in rural areas.

Their cultural norms surrounding eating are well ingrained. The manner in which food should be obtained, kept, prepared, served, and consumed is determined by customs and traditions, while income, food production and availability, and marketing facilities have an impact on an individual's eating preferences. With time, various dietary preferences and prejudices develop. Malnutrition is ultimately caused by the interaction of the effects brought about by the social factors and the individual factors. According to Jelliffe (1966), the causes of malnutrition include poverty, ignorance, traditional beliefs, unhygienic and unsanitary conditions, a lack of use of locally available, inexpensive foods, wastage of food and nutrients due to inadequate and

improper cooking techniques, and unfavorable eating habits and foods. According to the Food and Agriculture Organization (1975), socio-economic and environmental factors are at the heart of most of the causes of malnutrition, and when these elements are taken into account, the complexity of the malnutrition problem is made clear. Similar to this, less intake, fewer storage options, aberrant intermediate metabolism, and higher biological demand can all contribute to nutritional deficiency illnesses. The amount and quality of nutritional availability have changed over the years, but the overall situation has not changed due to the strong population pressure, the growth of the population in relation to the production of food grains, taboos from religion and culture, and ignorance.

The research of nutritional deficiency diseases at the village level in south Haryana has been attempted. Average daily calorie availability and intake from different food items per person in the research area are insufficient. With the exception of major farms, its average consumption is judged to be inadequate across the board. Malnutrition is mostly caused by poverty in the majority of poor nations (Basir O., 1962), which has prompted some studies to label it a socio-economic disease. According to the author, a sizeable percentage of a villager's income goes into meeting social obligations and formalities, paying back loans or interest on debts, and upholding unhealthy habits like drunkenness. The majority of the food purchased cereals, to a lesser extent, pulses, and leafy vegetables—constitutes two thirds of the household's income. Just about 10% of food budgets are allocated to animal products, such as milk. "Poverty-related restrictions on food availability and consumption mean that, even when some fundamental food items are physically available in the market, they remain out of reach due to high prices. So, the component of food security that most people struggle with is not so much the scarcity of physical food supply as it is the accessibility of that food to those in need for successful acquisition and consumption"(National Institute of Nutrition 1987). Nonetheless, it has been suggested that the country's current food crisis is not one of physical availability but rather one of demand and supply, with the country's food needs being significantly more than the local supply. "One of the primary factors affecting the availability and consumption of food in rural areas is undoubtedly the inadequate food storage and preservation capabilities" (Qureshi, A.(1979-80). Because a sizable amount of the food produced is ruined before it reaches consumers. Due to improper handling, the majority of produced foods become unfit for ingestion after a given amount of time. Even when kept, they do not last very long because the majority of traditional storage facilities are inadequate. "It is well documented that bacterial infections and parasitic infections play their role in addition to the nutritional problems. There is a general absence of sanitation especially in rural areas. The result is that infection is common and always acts to precipitate malnutrition"(Rawat, S. 1989).

Food grains make up the majority of the village population's diet, and the residential areas are unhygienic and devoid of a significant number of chronic deficiency disorders. "Malnutrition is a contributing factor in a number of diseases"(*Scott, P.1957)*. Hence, sanitary problems and dietary deficits have diverse effects on the growth and development of many other diseases. The diet of almost 1/5th of the population of the selected villages is deficient in protein while the

actual intake of Fat, Calcium, Vitamin -A, Vitamin -B and Vitamin -C and carbohydrates is inadequate. However the consumption of Thiamine and Phosphorous is satisfactory to a certain extent. (Table-3) Malnutrition is quite prevalent and is a direct result of such insufficient diets. The chronic malnutrition and poor diets, as well as backwardness and ignorance, are major contributors to the morbidity in the chosen villages. Out of the total morbidity, the morbidity ranges from 7.5 to 17.9%, and the mortality ranges from 9.5 to 16.3%. (Table-2)

The major diseases are discovered to be caused by dietary deficiencies based on the symptoms of the various disorders. Diseases that affect the male population of the study area differ from those that affect the female population, and among youngsters, stunted growth, Keratomalacia, and night blindness are widespread. "Disease prevalence in the chosen villages is not consistent, but the type of the illnesses is comparable because of the importance of hygienic circumstances"(Weaver, J.C. 1954). When compared to other nutrients, protein insufficiency and demand are particularly significant. The calcium deficiency is related to the occurrence of osteomalacia and Haemophilia which together affects all the villages under study (Table-4).Where calcium is not available for normal metabolism, results in impairment in growth of teeth and bones. The defective tooth formation in early childhood,with possible effects on increasing dental caries and particularly growth and improper development of bones. Protein is second important constituents of the diet with deficiency symptoms in the village cause the loss of the weight, decrease resistance to diseases etc. Reduced resistance to infection results from its absence. "Proteins are required by the body on a daily basis to repair and regenerate tissues. The body's requirements for protein change as it grows. In the research area, vitamin A insufficiency is frequently observed"(Shaffi, M 1960). Its average intake is determined to be insufficient in all categories as a result of a diet that is low in protein and poor in vegetables. Thiamine is not readily available in the study area, but the average daily intake per person in the area and across all categories was determined to be enough because cereals are the primary source of thiamine, which makes up a significant portion of dietary items. "Riboflavin deficiency is also widespread in the study area. The biological value of the cereals protein is higher than that of proteins from root crops and starchy roots"(Singh, M.B., Singh R and Singh V.K1997). The majority of people rely on grains and plant proteins. While plant proteins are insufficient, animal protein is the only protein that is complete and contains all the necessary components. Hence, it would seem desirable for the human diet if animal protein, which is only present in 10% of villages, provided at least one third of the body's protein needs. The diseases correlated with the deficiency of protein in the diet are Protein Calorie Malnutrition (Kwashiorkor, Hypoprotonaemia) which together effects20 % of the total patients alone and Kawashiorkor is the most common diseases among children. The deficiency of vitamin C and ascorbic acid is uneven among the village population and not related with the economic characteristic. "The deficiency of it is related with the symptoms such as cracked lips, burning and itching eyes etc. It is crucial for development, overall health, and the wellbeing of the skin, eyes, and mouth. Moreover, angular stomatities and gastrointestinal disorders might result from the shortage of riboflavin"(W.H.O.1983). The relative strength of

various diseases is evaluated by ranking them in terms of importance in order to highlight the areas where dominating diseases are found. In 25% of villages, vitamin-A deficiency disease and protein energy malnutrition disease rank top. Provide a straightforward diagram of the second most prevalent sickness, which only includes three illnesses: vitamin-A deficiency diseases, protein energy malnutrition, which affects 25% of villages, and calcium deficiency diseases, which affect 7.33 percent of villages. Thus PCM is first ranking deficiency disease followed by vitamin-A in several villages. (Table -2).Similar to how a vitamin shortage, in general, may not necessarily be causing just one specific ailment. In accordance with varying levels of nutrient deficiency, human resistance, fluctuating climatic conditions, various endemic relationships to malnutrition or deficiency conditions, differences in food items from place to place, and changes in food items at a certain place from one period to another, the deficiency of one or more nutrients may produce different diseases.

The iron content of the diet is one of its key components. Yet, the body only requires a tiny amount of iron. The red blood corpuscles in the blood are coloured crimson by it. Since iron regulates key functions and is a necessary component of haemoglobin, it is often sufficient in the diets of the chosen communities. There are, however, a lot of cases of anaemia brought on by a lack of iron. The body does not receive enough iodine to maintain the reserves needed for the generation of enough thyroid hormones and thyroxin for health and growth, which results in iodine deficiency disorders including goitre and cretinism. "The food in the hamlet also includes insufficient amounts of iodine. Due to the low economic situation in south Haryana, it is difficult to obtain nourishing foods that are a rich supply of calcium, vitamins, lipids, and proteins from both animal and plant sources"(*Laxmi Devi, A.1983)*. Many diseases have appeared in the research region as a result of under nutrition, malnutrition, ignorance, certain unscientific dietary traditions, unsanitary living circumstances, and terrible housing.

Prevention of malnutrition: The severity of malnutrition among the population in emerging nations has heightened the necessity for comprehensive analysis and planning to address this issue. Extensive nutritional planning was outside the purview of this investigation. Yet, there are some recommendations that can be made to create a nutritious plan. "The complexity of the dietary issue must be underlined. No one academic field can assert that it has all the answers. In order to combat malnutrition in this nation, we must first increase food production in order to feed all of our citizens, and then we must teach and educate the populace on the value of a diet that is nutritionally balanced. Finally, I want to underline the importance of horticulture and agricultural variety"(Lal, Sunder, Khanna, P. & Sood, A.K.1992). Although parents' ignorance or lack of understanding about how to properly feed their children is one of the key socioeconomic and environmental factors that contribute to malnutrition, appropriate nutrition guidance can affect the nutritional status and growth of a significant part of these kids. So, a complete nutrition programme should not only focus on diet improvement but also on crop planning, infection control, nutrition education, health education, and family planning. The most fruitful method for combating hunger in the research region will be an integrated programme with such a mutually reinforcing component.

Table-3

Percentage departure of actual intake of nutrients selected in the Study area (By land holding) 2012-13

	Calorie	Protein	Fat	Carbo-hydrate	Calcium	Phos-phorous	Iron	Vit.-A	Thiamin	Riboflavin	Vit. – C	Niacin
	K-cal	gm	gm	gm	mg	mg	mg	ʃg	mg	mg	mg	mg
LF	+2.94	+18.33	+69.40	-18.01	+26.40	+35.91	+18.96	-30.68	+45.00	-25.71	-34.50	-47.25
MF	-19.80	-8.17	+14.25	-28.28	-29.50	+7.86	-2.75	-61.95	+38.33	-29.29	-59.17	-51.00
SF	-25.59	-16.15	-15.20	-31.36	-34.99	+7.23	-5.21	-65.72	+36.67	-41.43	-68.70	-48.69
AL	26.78	-25.17	-21.20	-35.05	-34.27	-13.48	-26.64	-60.54	+24.17	-37.14	-61.85	-56.81
Average	-17.31	-7.78	+3.25	-28.17	-18.08	+5.38	-3.89	-54.72	+36.04	-43.21	-56.06	-50.94
LF	+3.61	+20.57	+54.55	-16.95	+47.47	+40.67	+28.11	-18.73	+48.33	+30.71	+0.98	-44.06
MF	-11.75	-11.27	+25.40	-24.17	-0.15	+23.43	+20.18	-45.61	+40.83	+11.43	-48.15	-46.27
SF	-29.57	-26.77	-48.45	-32.95	-27.95	+5.05	+14.79	-61.69	+27.50	+15.00	-58.77	-47.25
AL	-30.61	-33.02	-53.25	-35.14	-29.64	-2.70	-17.46	-56.56	+18.33	-12.29	-56.25	-52.94
Average	-17.08	-12.62	-5.45	-27.30	-2.57	+16.61	+11.39	-55.65	+33.75	+10.71	-40.55	-47.75
LF	+1.66	+18.03	+65.05	-17.97	+29.47	+36.69	+17.29	-19.78	+51.67	-20.71	-22.72	-42.87
MF	-19.78	-20.17	+1.25	-21.63	-22.67	+10.78	-3.36	-56.33	+38.33	-30.71	-66.85	-50.25
SF	-27.72	-31.42	-15.15	-34.43	-37.06	-0.11	-15.46	-68.75	+18.33	-33.57	-71.62	-53.44
AL	-26.73	-32.35	-16.30	-35.79	-34.52	-2.77	-22.36	-57.99	+25.83	-37.86	-67.45	-49.94
Average	-18.14	-16.47	+8.70	-29.45	-16.20	+11.15	-5.96	-50.71	+33.54	-30.71	-56.65	-49.12
LF	+2.20	+14.60	+40.50	-17.05	+52.17	+34.77	-0.86	-22.82	+44.17	-15.00	+4.95	-46.00
MF	-21.65	-28.08	-27.90	-32.25	-12.69	-1.68	-17.61	-45.42	+24.17	-22.86	-48.00	-56.44
SF	-32.77	-31.05	-46.95	-42.95	-23.30	+0.09	-30.04	-59.81	+1.67	-35.00	-60.42	-54.12
AL	-30.23	-45.62	-55.75	-32.24	-37.81	-24.33	-42.54	-50.35	+9.17	-44.29	-54.30	-64.06
Average	-20.61	-22.53	-22.50	-31.12	-5.41	+2.21	-22.75	-44.60	+19.79	-29.29	-39.45	-55.12
OVER VIEW OF SOUTH HARYANA												
LF	+2.60	+17.88	+57.40	-17.50	+38.88	+37.01	+15.89	-23.00	+47.5	-7.86	-12.82	-55.06
MF	-18.24	-16.92	-3.85	-28.58	-16.25	+10.09	-0.89	-52.33	+35.83	-17.86	-55.05	-51.00
SF	-28.91	-26.35	-31.45	-45.42	-30.83	+3.06	-8.96	-63.99	+20.83	-23.57	-64.85	-51.00
AL	-28.59	-34.03	-38.05	-34.55	-34.06	-10.82	-27.25	-56.36	+19.17	-33.57	-59.95	-55.94
Average	-18.29	-14.85	-4.00	-29.01	-10.57	+9.84	-5.29	-48.92	+30.83	-20.71	-48.17	-50.75

Note : LF : Large Farmer; MF : Medium Farmer; SF : Small Farmer; AL : Agricultural Labourer; Avg. : Average
Source : Field Survey

Table-4

Prevalence of Deficiency Disease in the Study Area

Symptoms of Various Deficiency Diseses

	PCM (1)	Vitamin – A (2)						Vitamin-B (3)					Vitamin-C (4)				Iron (5)			Others (6)				(7)
	Protein Energy Malnutrition Diseses Symptoms (i.e.o edema, Marasmus, Obeseity, Emaciation, etc)	Night blindness	Conjunctional xerosis	Bitots spots	Keratamalacia	Other Vitamin-A deficiency disease	Total	Angular stomatitis	Glossitis	Pellagra	Other Vitamin-B Complex disease	Total	Survey (Total)	Rickets	Teeth caries	Total	Anaemia	Kolonchia	Total	Phynoderma	Polio	Otitis	Total	Grand Total
Birola																								
L.F.	4.5	9.1	*	4.5	*	*	9.1	4.5	*	*	*	4.5	9.1	13.6	*	13.6	*	*	*	*	*	*	*	40.9
M.F.	12.9	*	9.7	*	6.4	*	12.9	*	*	*	6.4	6.4	19.3	6.4	*	9.7	16.1	*	*	*	*	*	*	54.8
S.F.	23.5	*	2.9	8.8	11.8	*	17.6	5.9	5.9	5.9	*	11.8	11.8	8.8	5.9	11.8	*	*	*	2.9	*	*	2.9	70.6
A.L.	23.1	*	*	15.4	7.7	*	19.2	11.5	*	*	7.7	19.2	15.4	*	3.9	3.8	7.7	*	7.7	*	3.8	*	3.8	69.2
Avg.	16.8	1.8	3.5	7.1	7.1	*	15.0	5.3	1.8	1.8	3.5	10.6	14.2	7.1	5.3	11.2	1.8	*	1.8	0.9	0.9	*	1.77	60.2
Sureli																								

L.F.	12.0	*	8.0	*		8.0		*		12.0	*	*	*	4.0	4.0	8.0	*	4.0	4.0	*	*	*	*		*		*	*	36.0
M.F.	10.7	3.6	*	10.7		7.1		7.1		21.4	7.1	*	*	*	7.1	*	3.6	7.1	10.7	3.6	*	3.6	*		*		*	*	53.6
S.F.	18.7	*	6.2	6.2		9.4		*		15.6	3.1	*	6.2	9.4	15.6	15.6	9.4	3.1	9.4	6.2	*	6.2	*		*		*	*	65.6
A.L.	28.6	*	9.5	14.3		4.8		*		23.8	*	9.5	*	4.8	14.3	14.3	4.8	9.5	14.3	4.8	*	4.8	*		*		*	*	71.4
Avg.	17.0	0.9	5.7	7.5		7.5		1.9		17.9	2.8	1.9	1.9	4.2	10.4	9.4	4.7	5.7	9.43	3.8	*	3.8	*		*		*	*	56.6
Tajpur																													
L.F.	5.3	*	10.5		5.3	*		*	15.8	*	*	*	5.3	5.3	*	15.8	5.3	21.0	*	*	*	*		*		*	*	42.1
M.F.	14.8	3.7	7.4		7.4	*		*	18.5	3.7	*	*	3.7	7.4	14.8	*	7.4	7.4	*	7.4	7.4	*		*		3.7	3.7	59.3
S.F.	26.5	*	2.9	14.7	2.9		*	17.5	5.9	*	*	2.9	8.8	8.8	2.9	5.9	8.8	*	5.9	5.9	8.8	*		*	8.8	74.5
A.L.	38.5	*	*	7.7	11.5		*	19.2	*	*	3.8	7.7	11.5	7.7	7.7	15.4	*	*	*	*		*		*	*	80.8
Avg.	22.6	0.9	4.7	10.6	3.8		*	17.9	2.8	*	0.9	4.7	8.5	9.43	5.7	6.6	12.3	*	3.8	3.8	2.8		*	0.9	3.8	61.0
Kolwaka																													
L.F.	8.0	*	*	4.0	4.0		*	8.0	8.0	4.0	*	8.0	20.0	*	4.0	12.0	12.0	*	*	*		*		*	*	44.0
L.F.	25.0	7.1	*	3.6	3.6		*	14.3	3.6	*	3.6	*	7.1	10.7	7.1	7.1	14.3	3.6	3.6	7.1		*		*	*	60.7
S.F.	31.6	2.6	7.9	7.9	*		*	15.8	2.6	*	2.6	5.3	10.5	10.5	5.3	7.9	13.2	5.3	5.3	10.5	2.6	*		*	2.6	76.3
A.L.	37.9	*	6.9	-	10.3		*	17.2	6.9	6.9	*	6.9	20.7	10.3	3.4	6.9	10.3	*	*	*	*	*	6.9	6.9	86.2
Avg.	26.7	2.5	4.2	4.2	4.2		10.8	5.0	2.5	1.7	5.0	14.2	8.3	5.0	8.3	12.5	2.5	2.5	5.0	0.8	*	1.7	2.5	68.3
Overview of South Har																													

ya na																									
L.F.	7.69	2.18	4.40	3.3	3.3		*	11.0	3.30	1.10	*	4.40	8.79	4.40	7.69	5.49	12.09	*	*	*	*	*	*	*	40.7
L.F.	15.79	3.51	4.39	5.3	4.4		1.7	16.7	3.51	*	0.88	2.63	7.02	11.40	4.39	7.89	12.28	1.74	2.63	4.38		*	0.9	0.9	57.0
S.F.	25.36	0.72	5.07	9.2	5.8		*	16.7	4.35	1.54	3.62	4.35	11.59	11.59	6.52	5.80	10.87	2.90	2.90	5.80	3.62	*	*	3.6	72.5
A.L.	32.35	*	3.92	8.8	8.8		*	19.6	4.90	3.92	0.98	5.88	16.67	12.75	3.92	6.86	10.78	2.94	*	2.94	*	1.0	2.0	2.9	77.4
Avg.	20.90	1.57	4.49	7.0	5.6	0.4	16.18	4.04	1.57	1.57	4.27	11.01	10.34	5.62	6.52	11.40	2.02	1.57	3.60	1.12	0.2	0.7	2.0	63.1

Source: Field Survey.

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