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SOCIO-ECONOMIC STATUS AND FOOD SECURITY AMONG MARGINAL FARMERS IN ALIGARH DISTRICT: A CASE STUDY OF SUKHRAVALI VILLAGE (U.P.)

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ABSTRACT

Agriculture plays a vital role in Indian economy. The Marginal and small farmers are the bedrock of global food production as their small farms feed most of the world's population. The share of agriculture sector in India's total gross domestic product (GDP) is about fifteen percent (15.3%) and still remains main source of livelihood for nearly half of the India's population. India is the land of small and marginal farmers, which are about seventy percent of country's farmers' population. These farmers constitute half of the food insecure and poverty ridden population. The present study is conducted to study the food security status of these marginal farmers. Structured questionnaire and interview schedule were used to collect the relevant data, which were analyzed using appropriate statistical techniques. Fifty one farmers, about 35% of the total village population were randomly selected. A range of variables pertaining to their age, sex, education, occupation, health, food grain production, average size of the landholding, family size, credit facility, PDS, income etc. were selected to assess their food security levels. The incidence of food insecurity was found high among a section of the households of marginal farmers. Hence there is a need to create an enabling environment for marginal farmers to raise their income and standard of living so that the status of their food security can also be improved.

KEYWORDS: *Food Security, Family Size, Marginal Farmers.*

1. INTRODUCTION

Marginal and small farmers in developing countries play a key role in meeting out the future food demand of growing population as they constitute majority of farm population in developing countries. The term 'Marginal farmer' refers to a farmer cultivating as owner or tenant or as a share cropper on agricultural land up to one hectare (2.5 acres) in size.

Socioeconomic status (SES) is reflected by the individual's or household's economic and social position in relation to others, and is primarily based on the level of income and education as well as the type of occupation.

In India, the agrarian structure for the past decades has undergone a process of decline in farm size and increment in marginalization of land holdings. These changes in agrarian structure also affect poverty alleviation and agricultural growth (Singh, 2013). In context of climate change, the crop production in future will be affected by rising temperature, frequent extreme events and uneven rainfall patterns etc. and the impact will be higher in those places which are already vulnerable (Morton, 2007). There has been research on agricultural productivity which is dealing with the increasing demand for food worldwide (Beddington 2010; Godfray 2015).

Food security as per "The State of Food Insecurity" (2001), is achieved "when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs as per their food preferences for an active and healthy life". The WHO states that there are three pillars that determine food security. These pillars are food availability, food accessibility, and food utilization. The Food

and Agriculture Organization (FAO) adds a fourth pillar of stability to the previous three dimensions of food security. The World Summit on Food Security (2009) therefore, stated that there are four pillars of food security viz food availability, food accessibility, food utilization, and food stability.

According to the studies based on the World Programme for the Census of Agriculture (WCA) 2000, it shows that the Asia and Pacific region has the smallest size of holdings in the world. The livelihood of marginal and small farmers are more vulnerable to shocks resulting from weather change and pest attacks. It has been assessed that out of 500 million small landholdings, Asia and Pacific region constitute about 87% of the total small farms (Hazell *et al.*, 2007).

India, a developing country supports over 17.5% of the world's population on 2.4% of the world's land area. Majority of population about sixty eight percent, (Census of India 2011) lives in villages and is engaged in agricultural activities. Agriculture plays a pivotal role in the Indian economy contributing about fourteen per cent of India's GDP (2015) and providing employment to the majority of its population i.e., about 55 percent. (Ministry of Finance, Government of India, 2015).

India in pre-independence era has suffered from repeated food shortage during 1943, 1905, 1899, 1896, 1888, 1876, 1870, 1873, 1900, 1930 etc. The Green Revolution of 1960's increased the food production manifold. After the first and second wave of green revolution the country now is again confronting with the problems of declining food grain production as well as food availability which is due to rapidly increasing population on one hand as well as declining land fertility on the other, besides other factors. So the status of farmers' particularly marginal farmers as well as their food insecurity has become a matter of great concern.

The Indian agriculture has experienced greater change over the decades. The reduction in farm size and increment in the number of marginal farmers has deteriorated the condition of the farmer's community as a whole, however, the marginal farmers are greatly affected. In 2004-05, the poverty rate among farmers was estimated to be 15.2 per cent, 18.1 percent was among the marginal farmers, 14.8 per cent among small farmers and 9.8 per cent among medium and large farmers (Chadha, 2008). This has impacted upon the whole scenario of agriculture productivity and food security adversely among the farmer's community. For development purpose and reducing poverty, the role of small farms has been recognized very well (Lipton, 2006).

India is the land of marginal and small farmers where the average farm size is 1.15 hectares. Most of the farmers are poor and with a single source of income, they cannot grow enough food grains to feed their families. As per the Agricultural census 2010-11, the marginal farmers constituted 67.1 percent of the country's farmer's population and these farmers own only twenty two per cent of the total cultivated land and major share of India's food produce (49.8%) comes from these marginal farmers (Agriculture Census 2010-11, Mintistry of Agriculture). A study conducted by Indira Gandhi Institute of Development Research (IGIDR) in 2012 computed that small farmers contribute about 51.2% of total food production (Dev, 2012).

The average size of land holdings has gradually declined after the country's independence. The average size of land holding per marginal farmer in India as well as Uttar Pradesh is about 0.39 ha (Agriculture Census 2010-11, Mintistry of Agriculture). If this current trend continues, the marginal and smallholding nature of agriculture is only going to raise problems in coming years. Hence, the future of the Indian agriculture therefore, much depends greatly on the performance of these small and marginal farmers only.

Many of the geographers and authors from other disciplines such as Swaminathan M.S. (2010), Godfray, H.C.J., (2015), Lipton, M. (2006), Chadha, G.K., (2008), Hazell P.B. (2007), Singh, Ajit kumar (2013), and Beddington, J. (2010)etc. and many more have attempted to explain the marginal farmers' socio-economic conditions and the level of food security among them.

2. OBJECTIVES

The, study of Sukhravali village is carried out to realize the prevailing socio economic condition of marginal farmers and the level of food security among them. Following are therefore, the main objectives of the present study:

1. To determine the economic status of marginal farmers in the Sukhravali village.
2. To evaluate the social status of marginal farmers in the Sukhravali village.
3. To suggest the appropriate measures to improve the level of food security among the marginal farmers of the village.

3. DATA AND METHODOLOGY

The study is based on data collected through primary survey. For this, the data on cropping intensity, irrigated area, consumption of fertilizers, agricultural implements, levels of education, size of landholding, banking facilities, family size, average production, annual income from all sources, infrastructural facilities, sources of irrigation and the percentage of irrigated land as well as healthcare facilities were collected.

These data were collected with the help of a well-structured questionnaire. Random sampling was done to select thirty five percent of total marginal farmers of study area which accounts to fifty one households. The complimentary secondary data like population, agricultural infrastructure, bank loans etc., were obtained from District Statistical Handbook, bank reports, block development office, Agricultural Census etc. Data analysis was done by using descriptive simple statistical methods like, percentages and arthematic mean. The overall food availability among the marginal farmers both male and female farmers of the study area is computed in terms of energy produced and energy required in terms of Standard Nutrition Unit (SNU) values. The marginal farmers were categorized into three categories i.e., having land below 0.3 hectare, between 0.3 ha to 0.6 hectare and above 0.6 hectare of land. These categories of farmers were identified as small, medium and large marginal farmers. Maps and diagrams were made in GIS environment using Arc GIS 10.3 version.

4. STUDY AREA

The Sukhravali village is located in the Lodha block of Aligarh district. Its total population is 2556 persons. There are 147 marginal farmers including 58 female marginal farmers. Besides 147 marginal farmers there are 87 other farmers also who belong to the category of other than marginal farmers. Other natives of the village are engaged in various economic activities apart from farming. The total area of village is 190 hectares in which net sown area is 136 hectares. There are 415 households in the village. In the study area the share of

marginal farmers among total farmers is about 63 percent and they are cultivating forty percent (54 hectare) of the farmlands of the study area which is very less compared to the land available with other farmers. The average size of holdings presently with the marginal farms is about 0.3 hectares in the study area which is below the national as well as state's average of 0.39 hectares.

The village Sukhravali represents the climate of Aligarh district which is marked with average high summer temperature of (31 °C) and an average low winter temperature of (18°C). The rainfall usually occur during the rainy season and is about 800 mm. Some of the rainfall during winters occur due to western disturbances.

The study area is well connected with the city by *Pacca* road. Different facilities such as market, hospitals, *Mandis*, schools and colleges are not much far away from it. The village is dominated by Hindus mainly belonging to Sharma(s) and Jaat(s). The marginal farmers mainly belongs to Sharma(s), Kumar(s) and Jaat(s).

5. RESULTS AND DISCUSSION

The results showed that in the study area, about 18% of marginal farmers were females and 82% were males, mostly between the age group of 30-50 years. These farmers are more responsive to innovative technological changes. However about 60.7 percent of the total marginal farmers were solely dependent on agriculture for their sustenance. While others 39.3 percent of these farmers were engaged in both agricultural as well as other activities for their livelihood. Livestock rearing is an important subsidiary activity. These farmers sell milk and milk products in the various townships of Aligarh city. Hen, Goats and buffaloes are the mainly rearing livestockes in the village. Out of total marginal farmers 55% were having less than 0.3 hectares land and 27 % of farmers own land between 0.3-0.6 hectares whereas 18% farmers own more than 0.6 hectares of land.

As shown in Table 1, a fairly significant percentage of marginal farmers (27.6) including both males and females are uneducated and they never attended any school. About 39.1% of these farmers attained the level of primary education in which females were only about 7.8 %. This was because only two schools which provide education upto upper primary standard are in the village. Moreover, these figures also explain that among the marginal farmers, girls are not provided education equal to boys for one reason or the other. Secondary (10+12) level education was obtained by 25.5% of the marginal farmers in which only 2% were the females. This landslide downfall in the females education from primary level to secondary level is because there is no secondary level school within the village and parents feel it unsafe to send their daughters for education outside their village, as well as precarious economic conditions of the marginal farmers is another factor. The marginal farmers who received education upto graduation level are of 7.8% which is significantly very low as compared to those upto secondary level (25.5%). Moreover, it is also obvious that girls could not receive education upto graduation and only boys were able to reach that level. This situation again explains the inability of marginal farmers to educate their children especially female children.

The Table-1 also explains that majority of the marginal farmers are in the middle age group and few in the young age group. This situation explains the inability of less educated marginal famers to cope up with the innovative technological development and they also fail to make use of various government scheme. In the village, the average size of marginal holdings among farmers was 0.32 hectares. Further division of landholdings between the family members was also taking place which further reduced the farm size.

5.1 FOOD AVAILABILITY

Availability of food is essential component of food security. The productivity of crops is limited by uneven rainfall, diminished land suitable for agriculture as well as reduced period of crop growing season (Tadross et.al. 2009). In the village, about 37% of the marginal farmers have nuclear families whereas 63% of farmers live in joint families. Small families of all the marginal farmers constitute about 35.3%. The majority of the marginal farmers about 45% have a medium family size, and 19.7% of the households have large family size.

Among the small marginal farmers, all the three types of small, medium and large families were found to be 21.6%, 27.5% and 3.9% respectively. Whereas, in case of medium marginal farmers, the small, medium and large family size were found to be 9.8%, 11.7% and 7.9% respectively. Among the large marginal farmers, the small, medium and large family size were found to be 3.9%, 5.8% and 7.9% respectively. As shown in Fig.2, it is evident that due to large family size among all categories of marginal farmers, the per head food availability is low as compared to all categories of farmers having small family size.

The net sown area in the village is 134 hectare. The average productivity of selected food crops in the study area is 42q/ ha. The average production of wheat is 31 q/ha and that of potato is 53q/ha. Farmers grow one or two crops in a year. Besides wheat and potato, vegetables are also grown. Wheat produced is mostly used for own consumption as the total production is not much. Potato and vegetables besides own consumption are also sold in local market. Traditional farming equipment such as wooden ploughs, bullock cart, iron implements etc. are used by the farmers to produce these crops. There is lack of infrastructural facilities and marginal farmers irrigate their field by taking water on rent basis from large farmers.

The per head food availability of farm household varies with respect to different farm and family sizes. As shown in Figure 2, the per head food availability of small marginal farmers having small, medium and large families are 5.6 quintals, 3 quintals and 2.3 quintals respectively. In case of medium marginal farmers, the per head food availability of small family is 13.3 quintals whereas it is 7.3 quintals and 5.32 quintals for medium and large family size.

The per head food availability among the large marginal famers of small, medium and large families is 22 quintals, 12 quintals and 8.8 quintals respectively. The study reveals that as the size of family increases, the per head food availability decreases in all the three categories of marginal farmers. Hence, for them it is difficult to fulfill the food requirement of the family with a large family size. This greatly affects the food security status of households.

The overall food availability among the marginal farmers of the study area is computed in terms of energy produced and energy required in terms of Standard Nutrition Unit (SNU) values which are depicted in Table-2. The Table-2 shows the total caloric requirement of marginal farmers, both male and female. One kilogram of wheat contain about 3400 Kcal of energy and one kilogram of potato contains about 770 Kcal. The total production of wheat and potato

per annum amounts to 9100 kg and 15400 kg respectively.

The total caloric requirement of 89 male marginal farmers per annum is 81212500 Kcal and those of 58 female marginal farmers amounts to 42340000 Kcal. Therefore, total production of marginal farmers require about 123552500 Kcal per annum. Whereas, from the total production of wheat and potato a total amount of energy received is 42798000 Kcal. Hence, there is deficit of energy needs which amounts to 80754500 Kcal. So, marginal farmers lack required calories of about 80754500 Kcal.

5.2 FOOD ACCESSIBILITY

Access to food is primarily a matter of purchasing power and therefore linked with income and livelihood. Education level, age and gender also plays an important role in determining the purchasing power of the farmers.

As seen in Table 1, most of the farmers lie in middle and old age group, they have better and longer farming experience than young farmers. It is also observed that young farmers are deviating from their traditional farming practices and gradually are opting for other economic activities. Farmers belonging to backward caste and particularly women have less purchasing power in the village. The annual income of all the marginal farmers ranges between ₹ 9000—₹ 44000 rupees. It is observed that fifty five percent of small marginal farmers with less than 0.3 hectares of land are earning a meagre amount of ₹ 9050 per household annually which is far below the level of poverty line of 11680 rupees per annum as per C. Rangarajan, committee set up by the erstwhile Planning Commission now Niti Ayog in (2012).

The diagrammatic representation of food accessibility in all categories of marginal farmers (Figure-3), shows that the food accessibility among the small, medium and large marginal farmers' decreases with the increase in the size of their families. The farm income of small marginal farmers shows a variation of per head income ranging from ₹ 3113 to ₹ 1581 to ₹ 1231 for all the three categories of family sizes. The similar trend is also seen among the medium marginal farmers and large marginal farmers. The variations in the per head income as registered were from ₹ 8020 to ₹ 4072 to ₹ 2974 for medium marginal farmers and from ₹ 11085 to ₹ 6968 to ₹ 5090 for large marginal farmers.

From Figure-3 it is also noticed that among the small, medium and large marginal farmers with small family size the maximum earning goes to large marginal farmers while minimum earning goes to small marginal farmers. Similar trends are also found among the other categories of marginal farmers having small, medium as well as large family sizes. Hence, it can be deduced that larger the family size, the more is the food insecurity among the households and that the small marginal farmers with less than 0.3 hectares of land are worst affected with food insecurity.

The other thing which is obvious from the Fig.3 is that tendency of bearing a large family is also declining among all the three categories of marginal farmers. Farmers also buy food items from the government fair price shop at cheaper rates in the village which helps them to get over the inflationary situation prevailing in market. However, only fifty one percent marginal farmers are covered under public distribution system. There is one fair price shop in the village and the ration they receive is of inferior quality which they get at the rate of five kilograms of wheat per person per month at a subsidized prices of two rupees per kilogram. Some of the farmers for some reasons get lesser amount of Wheat than the prescribed limit set by government.

The annual per head subsidy on wheat amounts to about nine hundred rupees per annum. So the farmers with larger family size are comparatively more benefitted. In this way the farmers improve their purchasing power through the subsidy they enjoy. Similar subsidies are also provided on other food items obtained from the ration shop. So, the farmers are left with meagre amount of money after incurring household expenditure and other expenses. The low income and small farm size compel them to input less investment on land. Thus, low income and low agricultural investments level are also responsible for food insecurity.

5.3 FOOD UTILIZATION

Food utilization is another dimension of food security. It refers to how much already taken adequate diet is absorbed in the body i.e. what is the ability of the human body to absorb the nutrients from the consumed diet. The indicators of proper food utilization are safe drinking water, sanitation, proper food preparation, health care practices, health infrastructure etc. The absence of or the inadequacy of the availability of these factors causes the conditions of sub-optimal food utilization of various degrees consequently food insecurity is induced.

Several studies have established that malnutrition negatively affect productivity and economic growth. The body weakness and inactivity induced by malnutrition reduces the efficiency of the work. So health of the individuals controls the level of food utilization in the body. No proper health facilities are available in the village Sukhravali. All marginal farmers prefer to go to government hospitals which is more than five kilometers away in the city. Tap water which is supplied by the municipality of Aligarh city is available to 28.5% of small marginal farmers, 57% of medium marginal farmers and 66.6% of large marginal farmers.

As shown in Figure 4, the access to improved sanitation facilities among small, medium and large marginal farmers' households were found to be 36%, 57% and 55.5% respectively. This diagram shows that medium farmer have more sanitation facility.

Among the small, medium and large marginal farmers about 53.5%, 50% and 33.3% of children under 10 years of age were found to be stunted due to lack of proper food utilization. This shows that as far as the stunted growth of children is concerned the three categories of farmers are also not at par. There appears not much significant difference in the intake as well as utilization of food as depicted by the percentages of stunted children among the small and medium marginal farmers. However, among the large marginal farmers a significant drop in the number of stunted children is observed which is indicative of better food utilization. Access to tap water facilities among the small, medium and large marginal farmers is about 28.5%, 57% and 66.6% respectively. The figures states that the large marginal farmers are in a better position while small marginal farmers re having least access to tap water facility.

About 53.5% of small marginal farmers followed by about 50% of medium marginal farmers and about 33.3% of large marginal farmer's households in the study area are affected by water borne diseases. The provision of proper

sanitation and safe drinking water reduce the occurrence and spread of these diseases which ultimately affect food utilization significantly. The lack of cleanliness, chocked drainage, unsafe drinking water, narrow streets, littered with solid waste and weak children of farmers reveal the general pathetic condition of people living over there.

5.4 FOOD STABILITY

The droughts and floods occur occasionally however, there are many instances when frost, heat waves and untimely thunderstorms accompanied with hailstorms, untimely rains and fast winds have destroyed standing crops. Many villages in Aligarh district were hit by intense rains and hailstorms during March, 2016. In September, 2014 Uttar Pradesh government declared 44 of its 75 districts as drought affected districts including Aligarh district on account of the occurrence of about less than 50 per cent of the rainfall from the normal. Heavy rainfall in Sukhravali village occurred in July, 2016 which brought about significant damage to the standing kharif crops. In 2008-09, 2011-2012, 2012-2013, 2015-16 the inflationary prices of food items in the market further cut down the purchasing power of marginal farmers. This in turn hit the food stability very badly. Small marginal farmers were affected most (about 72%) while about 64% of the medium marginal farmers and about 44% of the large marginal farmers were hit by the volatile market situation.

In 2015-2016 inflation on food items was increased from 6.3 percent in April 2016 to 8.5 percent in July 2016. The prices of pulses and other food grains as well as fuel also increased which further deteriorated the food stability as well as the purchasing power of the marginal farmers. Lack of awareness and illiteracy compel the farmers to take easy loan from private moneylenders as it is evident from the fact that just twenty five percent of marginal farmers took loan from banks and on the other hand thirty nine percent farmers lend their assets to moneylender for seeking loan. This make the marginal farmers to pay hefty interest amount to private moneylenders, which also indirectly affect the food stability of these farmers in the study area. Another factor which is noteworthy here is that seasonal episodes of certain diseases like diarrohea, cholera and typhoid which incur extra expenditure out of the small earnings of these marginal farmers also jeopardizes the condition of food stability to some extent.

6. CONCLUSION

Although the marginal farmers contribute significantly to the grains production despite this their families are hungry and poor. It is observed that due to low food grain production, low literacy rates, fragmentation of holdings and traditional farming practices are some of the challenges which must capture the attention of the planners and government agencies in order to address and to contain the poverty and food insecurity in this village.

Educated farmers make the use of the modern technology and are aware of various government policies and programs as is seen among large marginal farmers of the village. So by further improving literacy levels and by generating more awareness among marginal farmers about the changing technologies as well as bank loan facilities would greatly help in enhancing the economic condition and food security status of the marginal farmers. Cooperative farming particularly by the small marginal farmers should further be encouraged as it provides high returns and opens up the doors for mechanized farming.

The social and economic status of farmers can be further improved by efficient monitoring of PDS and by putting strong checks on possible leakages. The land is fertile with immense potential to increase the crop production therefore, an effective Government support is urgently required for training these farmers in different aspects of farming for their capacity building. During the lean periods, there is need to extend support for the creation of non-farm working opportunities in order to enhance the income levels of marginal farmers. Diversification of agriculture considering the market demand is required for high returns. For future food security, the plant breeding will become a critical component by improving productivity of various crops (Foulkes *et al.*, 2010). Cultivation of wheat along with other crops like mustard should be encouraged along with beekeeping and dairying etc. for improving food security. This would have an indirect effect on poverty reduction and reducing the grip of food insecurity among the marginal farming community of the study area.

In a small size of farmland, there is more need for marketable surplus for ensuring income. In majority of the farming system the gap between potential and actual yield is high. An integrated approach is required to eliminate the social, infrastructure, technological and policy constraints responsible for decline in productivity and yield gap. For strengthening food security at household and an individual level, there is need to converge various government schemes, involvement of local bodies in identifying productivity constraints and use technology to enhance production and income (Swaminathan, M.S., 2010).

Rural health and infrastructural development within the village itself would further facilitate in improving the standard of living and food absorption levels among these poor farmers.

7.0 STUDY AREA

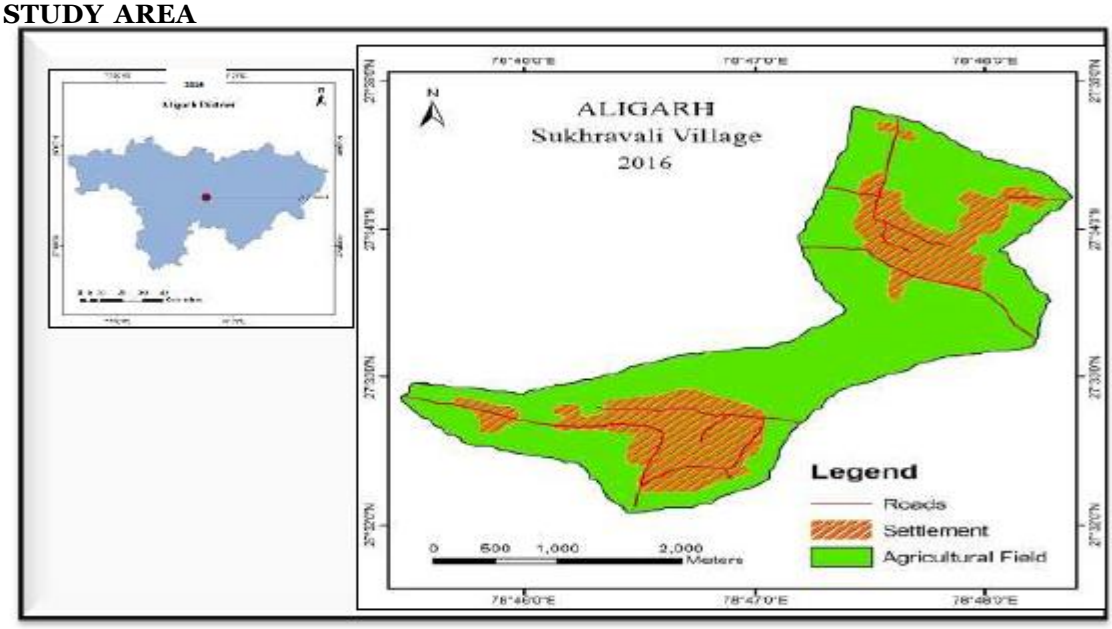

Figure 1 Showing Study Area - Sukhravali Village, Uttar Pradesh

Village Sukhravali
Per Head Food Availability of Marginal Farmers
(2016)

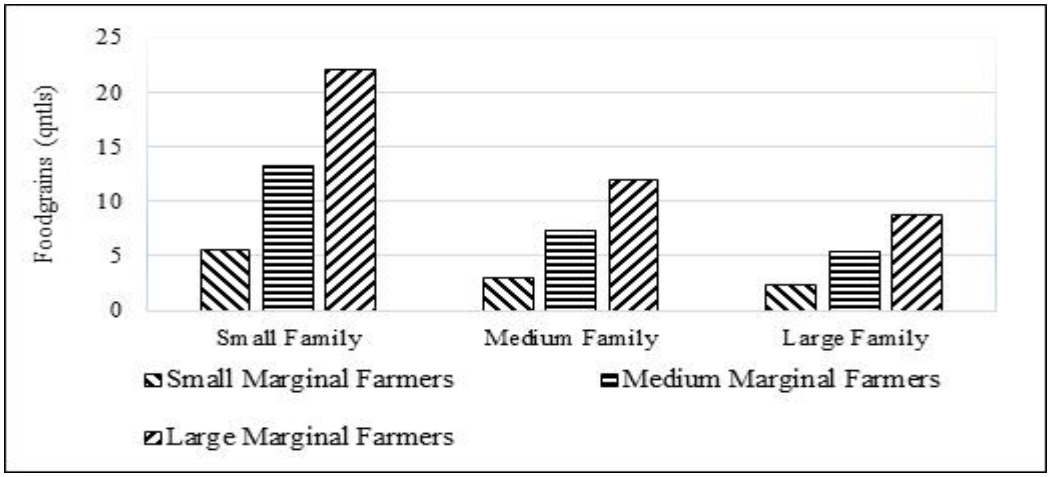

Figure 2 showing per head food availability of marginal farmers in Sukhravali village

Village Sukhravali
Food Accessibility
(2016)

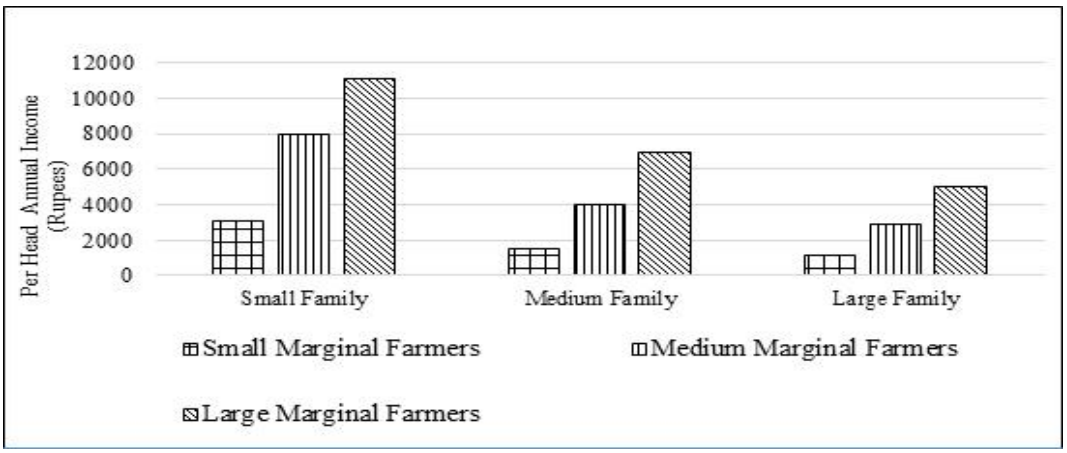

Figure 3 showing food accessibility among marginal farmers in Sukhravali village

Village Sukhravali
Food Utilization among Marginal Farmers
(2016)

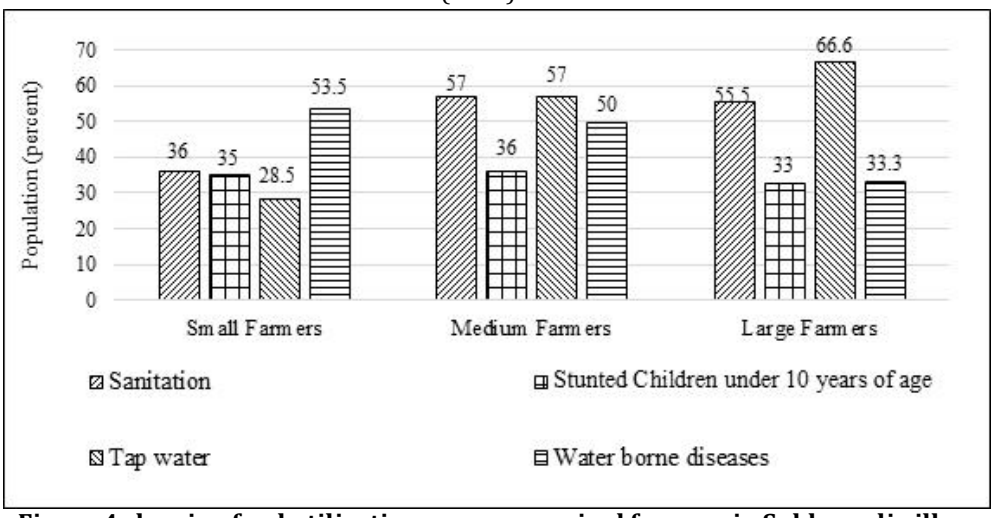

Figure 4 showing food utilization among marginal farmers in Sukhravali village

8.

Table-1
Village Sukhravali
Literacy and Educational Status of Marginal Farmers

Educational level	Male percentage	Female percentage	Total percentage
Primary	31.3	7.8	39.1
Secondary(10, 12)	23.5	2	25.5
graduation	7.8	0	7.8
Never attended school	17.6	10	27.6
Age			
Young (18-30)	17.6	2	19.6
Middle (30-55)	45	10	55
Old(above 55 years)	19.6	5.8	25.4

Table 1 showing education level among marginal farmers in Sukhravali village

Table-2
Village Sukhravali
Calories Intake of marginal farmers

Sl. No.	Commodity	SNU Per Kg (Kcal)	Total Production (Kg)	Male Population	Total calories required for male (Kcal per annum)	Female Population	Total calories required for female (Kcal per annum)	Total calories required for total population (Kcal per annum)	Actual calorie intake by total population (Kcal per annum)
1	Wheat	3400	9100						
2	Potato	770	15400	89	912500	58	730000	123552500	42798000

Table 2 showing calories intake of marginal farmers in Sukhravali village, Uttar Pradesh

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