

**Agriculture production and food security in Himalayan state Uttarakhand of India****Nidhi Arora\*, P.D.Singh\*\***

*\*Research Scholar, Department of Economics, SGRR PG College Dehradun,  
Uttarakhand (India)  
[nidhiarora1212@gmail.com](mailto:nidhiarora1212@gmail.com)*

**Pawan Deep Singh**

*\*\* Assistant Professor, Department of Economics, H.N.B.Garhwal University Srinagar Garhwal,  
Uttarakhand (India)  
[pawanmanhas1@india.com](mailto:pawanmanhas1@india.com)*

**Abstract**

Food security is a socio-economic issue directly linked to human health and sustainable development. Decrease in agriculture production may impact directly to food security, deficit agricultural production may invite to imports and hence increasing the price of the agricultural products making difficult to implement food security. Investments in agriculture are important to increase food security. The channels are complex and multiple. Rising productivity increases rural incomes and lowers food prices, making food more accessible to the poor. In Himalayas, food security of communities primarily depends on local agricultural productivity and food purchasing power. Major constraints of food security vary from fragmentation of agriculture land to fragility of landscape, high rate of erosion, low soils fertility, traditional methods of cultivation, poor infrastructural facilities including lack of proper market and finance. In Uttarakhand there are maximum hill districts making it difficult for the people inhabited in hill regions. Agriculture production as well as ensuring food security for all is an important challenge for the world community. This study shows a contribution of increased agriculture productivity to achieve food security. Study analysed various causes for agriculture instability and causing food insecurity therefore growth agriculture food grains should be increased as it plays an important role in the process of food security.

**Keywords: Food Security, Agricultural Productivity, Food Grains****Introduction**

Food security is a socio-economic issue directly linked to human health and sustainable development. India is a large developing country with nearly 55% of the population depending directly on the climate-sensitive sectors such as agriculture, fisheries and forests. A large part of the Indian agriculture depends on monsoon so that the market of agriculture, essential commodities shows fluctuation due to early/delayed arrived of monsoon. Any change in countries rainfall pattern impacts agriculture hence the country's economy and food security (Majra and Gur, 2009). Decrease in agriculture production may impact directly to food security, deficit agricultural production may invite to imports and hence increasing the price of the agricultural products making difficult to implement food security. The Food and Agriculture Organization (FAO) defines food security as a "situation that exists when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (FAO, 2002). The four key dimensions of food supplies: availability, stability, access, and utilization provided by this definition of FAO relates to the availability of sufficient food, ability of the agricultural system to meet food demand. Stability relates to individuals who are at high risk of temporarily or permanently losing their access to the resources needed to consume adequate food. An important cause of unstable access is climate variability, e.g., landless agricultural labourers, who almost wholly depend on agricultural wages in a region of erratic rainfall and have few savings, would be at high risk of losing their access to food (Schmidhuber and Tubiello, 2007). Access, covers access by individuals to adequate resources (entitlements) to acquire appropriate foods for a nutritious diet (F.Burchi and P.D. Muro, 2016). Entitlements are defined as the set of all those commodity bundles

over which a person can establish command given the legal, political, economic, and social arrangements of the community of which he or she is a member (Garibaldi, et al, 2017). Agriculture production as well as ensuring food security for all is an important challenge for the world community. This study shows a contribution of increased agriculture productivity to achieve food security. It has depicted the different productivity methods and factors in agriculture and their relative benefits. It also explains how increased agriculture productivity is linked to food security and demand-supply fluctuations. This study provides a few policy options to achieve food security and remove problems implementation of National Food Security ACT.

### Agricultural Productivity and Food Security

Investments in agriculture are important to increase food security. The channels are complex and multiple. Rising productivity increases rural incomes and lowers food prices, making food more accessible to the poor. Other investments—such as improved irrigation and drought-tolerant crops—reduce price and income variability by mitigating the impact of a drought. Productivity gains are key to food security in countries with foreign Investments in agriculture are important to increase food security (World Development Report-2008, 2007). Thus a key element is a purchasing power of consumers and the evolution of real incomes and food prices. However, these resources need not be exclusively monetary but may also include traditional rights, e.g., to a share of common resources. Finally, utilization encompasses all food safety and quality aspects of nutrition; its sub-dimensions are therefore related to health, including the sanitary conditions across the entire food chain (Schmidhuber and Tubiello, 2007).

Food insecurity could be an indicator for assessing vulnerability to extreme events and slow-onset changes. Agriculture production is directly linked to weather conditions and the net impact of food security will depend on the exposure to global environmental change and the capacity to cope with and recover from global environmental change. On a global level, increasingly unpredictable weather patterns will lead to falling in agricultural production and higher food prices, leading to food insecurity (Mahato, 2014). United Nations population data and projections (UN 2009) show the global population reaching 9.1 billion by 2050, an increase of 32 percent from 2010. Where the number of people suffering from chronic hunger has increased from under 800 million in 1996 to over 1 billion recently (Mahato, 2014).

### Season-wise Area, Production and Yield of Food grains

The agricultural sector in India has played a major role in the economic development of the country. It is important to note that the climate-sensitive sectors (forests, agriculture, coastal zones) and the natural resources (groundwater, soil, biodiversity, etc.) are already under stress due to socio-economic pressures (Sathaye, Shukla and Ravindranath, 2006). The performance of India's food grains production is given in the following table.

**Table 1. Kharif production, Area cover and Yield.**

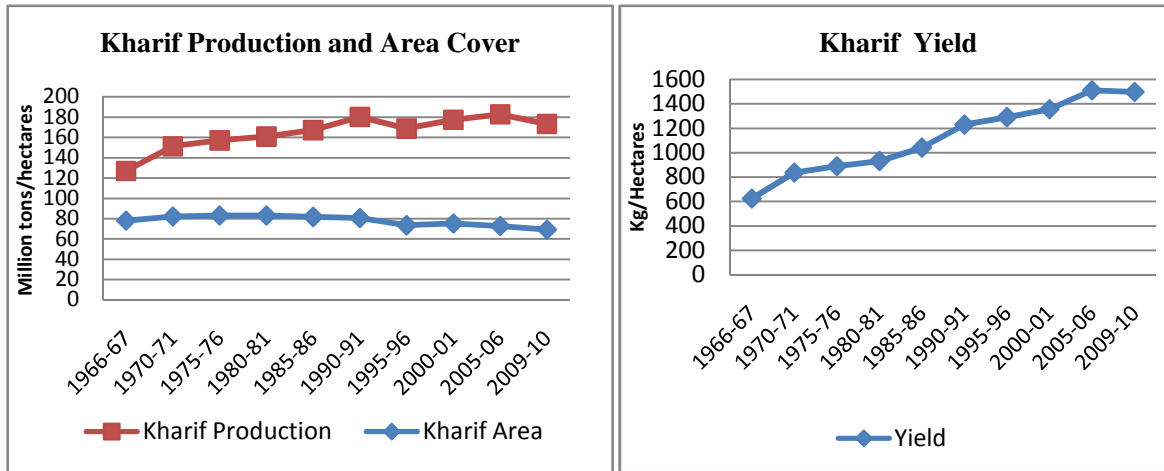
Year	Kharif			Rabi		
	A	P	Y	A	P	Y
1966-67	78.21	48.89	625	37.09	25.34	683
1970-71	82.36	68.92	837	41.96	39.50	941
1975-76	83.15	73.89	889	45.03	47.14	1047
1980-81	83.21	77.65	933	43.46	51.94	1195
1985-86	81.80	85.25	1042	46.46	65.19	1410
1990-91	80.78	99.44	1231	47.06	76.95	1751
1995-96	73.60	95.12	1292	47.42	85.30	1799
2000-01	75.22	102.02	1357	45.83	94.73	2067
2005-06	72.72	109.87	1511	48.88	98.73	2020
2009-10	69.33	103.84	1498	52.04	114.36	2197

Source: Directorate of Economics and Statistics, Department of Agriculture and Cooperation

\* Fourth Advance Estimates as released on 19.07.2010.

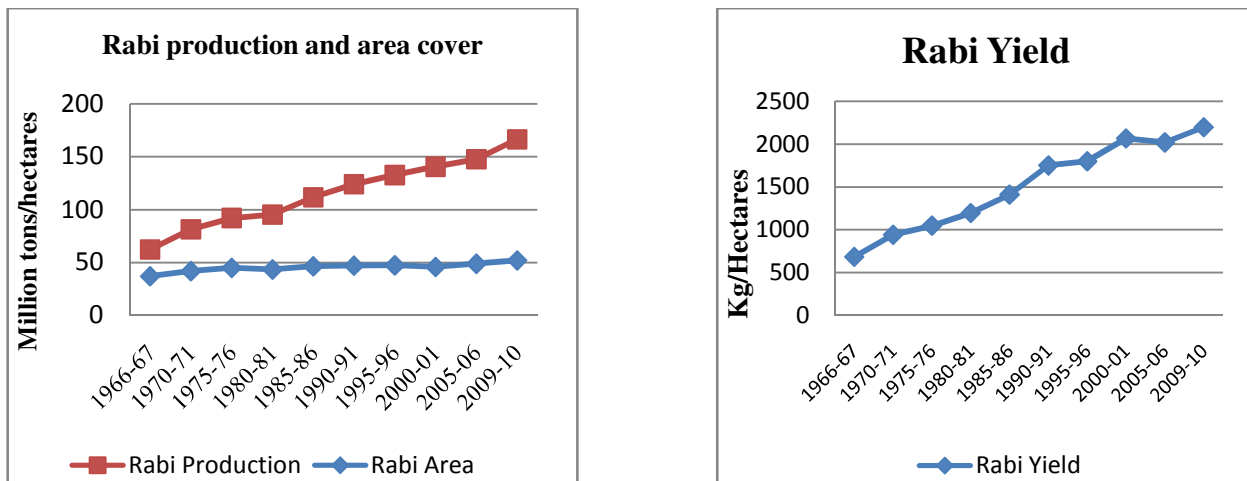
A- Area (in Million Hectares), P – Production (in Million Tonnes), Y – Yield (in Kg. /Hectare).

**Figure 1 (A) & 1 (B) Kharif production, Area cover and Yield.**



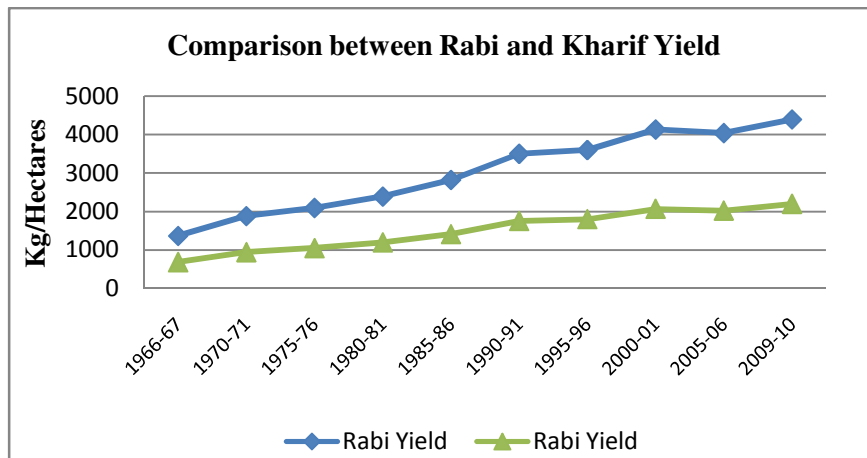
Above Figure 1 (A) represent Kharif production and area cover under Kharif production from 1966-67 to 2009-10. It is clear that Kharif production is increasing year after year whereas area covers is decreasing; it was 78.21 million hectares in 1966-67 whereas in 2009-10 it was 69.33 million hectares. And if we consult figure 1(B) we find that Kharif yield show increasing trend which means there is a positive growth from 1966-67 to 2009-10.

**Figure 2 (A) & (B) Rabi Production, Area Cover and Yield**



Above figure 2 (A) represents Rabi production and area cover, it is clear from figure that there is an increasing trend in crop production whereas area cover under Rabi is increasing but at a very low rate. Figure 2 (B) shows Rabi yield which shows increasing trend. It is clear from these figures that there is increasing trend over the years from 1966-67 to 2009-10 in the Production and Yield of Rabi.

**Figure 3. Comparison of Rabi and Kharif Yield.**



Above figure 3 shows increasing trend in total yield of Rabi and Kharif, therefore it is clear that there is a positive growth in both the fields.

**Agriculture production and food security in Uttarakhand**

In Himalayas, food security of communities primarily depends on local agricultural productivity and food purchasing power. Subsistence agriculture, which is forest based, constitutes the main source of rural food and livelihoods (Tiwari and Joshi, 2012). Major constraints of food security vary from fragmentation of agriculture land to fragility of landscape, high rate of erosion, low soils fertility, traditional methods of cultivation, poor infrastructural facilities including lack of proper market and finance (Sati, 2008). Uttarakhand is industrially backward because of the deficiency of resources as a form of minerals and petroleum products. A majority of the rural people does not get sufficient nutrition in their diet; consequently they suffer from nutrition deficiency related disease (Pant, 1996). The region has relatively infertile land with poor irrigation facilities. Difficulties in using modern technology and little use of modern inputs are because both unsuitability and non-availability (Sati, 2008). Crop yield is low in hills as compared to that in plains (Kumar and Tripathi, 1989) and in Uttarakhand there are maximum hill districts making it difficult for the people inhabited in hill regions. Shortages of crop production in these regions contribute to food insecurity. Food insecurity could be an indicator for assessing vulnerability to extreme events and slow-onset changes (Mahato, 2014).

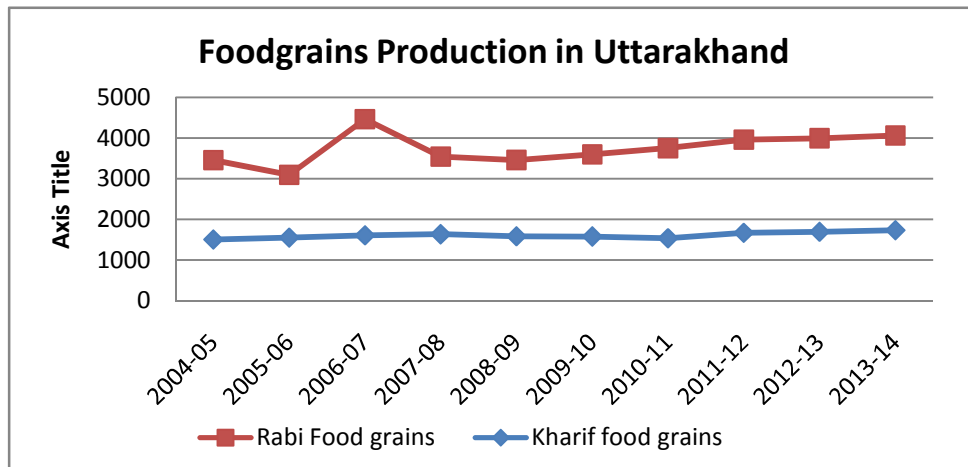
**Table 2. Yield of Food Grains in Uttarakhand**

Year	Kharif food grains	Rabi Food grains
2004-05	1502	1955
2005-06	1551	1544
2006-07	1606	2858
2007-08	1633	1909
2008-09	1580	1880
2009-10	1577	2022
2010-11	1535	2217
2011-12	1670	2291
2012-13	1693	2302
2013-14	1732	2329

Source: Directorate of Economics and Statistics, Ministry of Agriculture, Govt. of India (Agricultural and Statistics at a Glance, 2014),

[http://eands.dacnet.nic.in/latest\\_2006.htm](http://eands.dacnet.nic.in/latest_2006.htm)

**Figure 4. Production of Rabi and Kharif production in Uttarakhand**



Above figure 4. Shows increasing trend of food grains production, where Kharif production shows lower growth as compared to Rabi food grains. Hence it is clear that there is growth in production of Rabi as well as Kharif food grains.

### Conclusion

The fluctuation in the production, as well as productivity, is also realized along with the fluctuation in the area under cultivation. A change in area under cultivation is always accompanied by a change in production and yield of the food grains. The descriptive analysis of this study indicates that depletion of natural resources and changing pattern in the precipitation have stressed agricultural productivity and hence effecting food system. Apart from other causes climate change, the outcome of the "Global Warming" has now started showing its impacts worldwide. Climate is the primary determinant of agricultural productivity which impacts food production across the globe. The net impact of food security will depend on the exposure to global environmental change and the capacity to cope with and recover from global environmental change. While talking about the production of food grains in Uttarakhand, data shows that with the change in time there is a growth of production in Rabi as well as Kharif making way to food security hence it is very important to increase the growth of food grains. Study analysed various causes for agriculture instability and causing food insecurity therefore growth agriculture food grains should be increased as it plays an important role in the process of food security.

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