

Analysis of agricultural disparity in the production of Kharif and Rabi crops in Uttarakhand

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Abstract

Agricultural production lies at the base of the comprehensive approach to the reconstruction of the rural economy, which is embodied in the Third Five-Year plan. Development of irrigation, from large as well as small works, soil conservation programmes and supplies of fertilisers, improved seed and credit, along with the provision of extension services reaching down to the village level, are measures undertaken directly to increase production. These various aspects of agricultural development, and in particular, the specific programmes for increasing agricultural production, for which development plans have been implemented in Uttarakhand.

Increase in agricultural productivity is one of the foremost tasks in different regions of Uttarakhand. The state's food production can be increased only by raising the productivity of land, which provides the most ready means of achieving the immediate increase in the yields of different crops to keep pace with food demands. Hence, agricultural production is one of the prime measures of agricultural development. It is the operational output of the agricultural system and represents not only the structural components of the system but also process components, including extraneous elements influencing the agricultural activities. The assessment of agricultural productivity will, of course, help to increase the food supply for the growing population and will raise the standard of living of the people.

Keywords: Production, kharif crops, rabi crops, yield, resources, hectare

Introduction

Agricultural productivity shows the degree to which man has been able to exploit the physical resources of Uttarakhand for agricultural production. For the present study, two parameters have been chosen to demonstrate agricultural production and productivity. Each indicator has its own significance in the study. For example, the per-hectare yield of *kharif* and the per-hectare yield of Rabi crops reflect the agricultural efficiency of an area. The selected parameters for such are:

- a. Per Hectare Yield of Kharif Crops.
- b. Per Hectare Yield of Rabi Crops.

Per-hectare yield of kharif crops

The '*kharif*' crop is the autumn harvest (also known as the summer or monsoon crop) in Uttarakhand. *Kharif* crops are usually sown at the beginning of the first rains in July, during the south-west monsoon season. The term *Kharif* means "autumn" in Arabic. Agricultural activity, by and large, comes to a standstill during the peak summer seasons. With pre-monsoon showers, the farm activities again pick up their tempo. Farmers plough lands, prepare seed and await the break of the monsoon. With its onset, they sow their *kharif* crops in June or early July. By the end of the monsoon, these are ready for harvest. Thus, they need high temperature and high humidity.

Although the overall dominance of food grains in the cropping patterns of both crop seasons is evidently recognised, it is in the *kharif* crop season that food grains share a much smaller proportion than that in the *rabi* crop season. *Kharif* crops mainly include rice, millets, maize, *madua*, *sawa*, *kodo*, *kakun*, *kutti*, groundnut, sugarcane and pulses. In Uttarakhand, an average yield of *kharif* (including sugarcane) is 328.00 quintals per hectare of cultivated area. It has a great regional disparity among districts. The highest yield of *kharif* crops is in Haridwar with 2264.67 quintals due to high production of sugarcane, and the lowest one is in Pauri Garhwal with 07.55 quintals per hectare (Table 1.1). These districts are located in the Siwalik zone.

The spatial analysis reveals a very discrete distribution of *kharif* crops in the study area. Only two out of thirteen districts scored a positive z-score value, while the rest stand at negative values.

Table 1.1
**Standard Score Values of per Hectare Yield of Kharif Crops
(in quintals): 2004-05**

Classes & Z-Score Values	No. of Districts	%	Districts (Z-Scores)
(i) High > 0.50	02	15.38	Haridwar (2.68), Udham Singh Nagar (1.95)
(ii) Moderate - -0.43 to 0.50	08	61.54	Nainital (-0.27), Tehri Garhwal (-0.42), Bageshwar(-0.43), Chamoli (-0.43), Pithoragarh (-0.43), Champawat (-0.43), Dehra Dun (-0.43), Almora (-0.43)
(iii) Low < - 0.43	03	23.08	Rudraprayag (-0.44), Uttarkashi (-0.44), Pauri Garhwal (-0.44)

Source: *Uttarakhand, Directorate of Economics & Statistics*

The positive score values show a high yield of *kharif* crops, whereas the negative values show moderate and low yield of *kharif* crops.

In terms of the high-yield category, the distribution pattern, however, tends to show a distinctively high concentration of food grains in the *tarai* covering most of the fringes of Upper Ganga Doab and Haldwani-Bhabhar. The high concentration of *kharif* food grains and cash crops is covered by Haridwar with 2264.67, and Udham Singh Nagar with 1742.85 quintals yield per hectare. Hence, rice and sugarcane are the leading *kharif* crops. These districts are largely attributed to the suitability of the soil, favourable physiographic and climatic aspects. Proper and sufficient irrigational facilities in the absence of rainfall also support high yield per hectare.

About 61.54 per cent of the occurrences of state falls under the moderate category of yield of *kharif* crops. It includes eight districts in which the highest one is occupied by Nainital with 128.76 quintals, followed by Tehri Garhwal (18.29), Bageshwar (14.30), Chamoli (14.25), Pithoragarh (14.19), Champawat (13.66), Dehra Dun (12.73), and Almora with 11.75 quintals yield per hectare of cultivated area. These districts are extended in the entire north-eastern part of the region. The direct explanation of this category lies in the fact that in these areas, food crops, oilseeds, potatoes, vegetables, fruits, flowers and fodder crops accelerate the growth due to the suitability of the region, subsequent urban development and finally, the new market and price

incentives. Further, these districts are served with irrigation facilities, mostly self-controlled and other infrastructure of agriculture, which acts as a boost to the diversification of the farming system in the region.

The low category of *kharif* crop yield is covered by three districts of the region. Among this category, the highest one is held by Rudraprayag with 10.79, followed by Uttarkashi (9.03) and Pauri Garhwal with 07.55 quintals yield per hectare.

Per-hectare yield of rabi crops

The *rabi* crops (November to April) are basically similar to the *kharif* pattern in their primary orientation towards local needs, and in the thoroughness with which their different components are utilised. The sowing of *rabi* cropping is done in November or early December, and crops are harvested in March and April. Thus, they need low temperature and a short moist period during primary development and comparatively high temperature during the time of harvesting. In the study region, the main *rabi* crops are wheat, gram, barley, *masoor*, potato and oilseeds like mustard and rapeseeds, which are cultivated in approximately 5,21,186 hectares of area. The state thus recorded 23.31 quintals per hectare yield of *rabi* crops on average in 2004-05 (Table 1.2).

Table 1.2
Standard Score Values of per Hectare Yield of Rabi Crops
(in quintals): 2004-05

Classes & Z-Score Values	No. of Districts	%	Districts (Z-Scores)
(i) High > 0.50	04	30.77	Uttarkashi (1.89), Chamoli (1.71), Nainital (0.90), Udham Singh Nagar (0.68)
(ii) Moderate 0.00 to 0.50	02	15.38	Champawat (0.04), Tehri Garhwal (0.01)
(iii) Low < 0.00	07	53.85	Pithoragarh (-0.29), Bageshwar (-0.32), Almora (-0.45), Dehra Dun (-0.57), Pauri Garhwal (-0.92), Haridwar (-1.09), Rudraprayag (-1.58)

Source: Uttarakhand, Directorate of Economics & Statistics

Marked disparities were observed when district-wise analysis of the *Rabi* yield was conducted. Uttarkashi district scored the highest with 47.70 quintals of yield due to the high yield of potato, and Rudraprayag at the bottom with 02.85 quintals of yield per hectare of cultivated area. Thus, Uttarkashi holds top rank in production, followed by Chamoli (45.38), Nainital (35.00) and Udham Singh Nagar with 32.17 quintals of yield per hectare of cultivated area. The high concentration of the *rabi* belt is in *the Tarai* and the north-western part of Uttarakhand, which is mainly a wheat and barley (*rabi* crops) growing area. It is noteworthy that overall, six districts have yielded *rabi* crops above the average of the state. Here, climatic and physical features, better irrigational facilities, and more concentration on cultivating *rabi* crops in large amounts support high yield per hectare.

The amount of disparity could be seen in the moderate category, where two districts come under this. It is Champawat (23.80) and Tehri Garhwal with 23.41 quintal yield production per hectare of cultivated area. It is noteworthy that these two districts have a yield of *rabi* crops above the average of the state.

The low yield of the *rabi* crop is observed in almost seven districts of the state. The highest score of this category is held by Pithoragarh with 19.58 quintals, followed by Bageshwar (19.17), Almora (17.48), Dehra Dun (15.98), Pauri Garhwal (11.40), Haridwar (09.13) and Rudraprayag with 02.85 quintals yield per hectare of cultivated area.

Conclusion

Thus, all districts are located in the western part of Uttarakhand. Most of this part is covered by hills and glaciers. Only the Bhagirathi-Alaknanda Basins have some plain areas where cultivation of *kharif* is done. These districts have low productivity due to scanty rainfall, glaciated region and low irrigational facilities. This thus makes the soil infertile, hence reducing the per-hectare yield of crops. It is inferred that the per-hectare yield of *kharif* crop is directly governed by various factors such as intensity of crops, amount of rainfall, soil condition and the mechanism of agriculture.

Here, a high concentration of population on scanty resources has carved out the investment capacity of farmers. In these areas, less fertile soil, low land holdings, inadequate irrigation facilities and unsuitability of climatic conditions for *rabi* crops restrict the production capacity.

References

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