

## 2. Foodgrain Production: Towards an Explanation of Extremes

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### **Introduction**

Reduction of regional imbalances is one of the key challenges in agricultural development in India. Equally important is improving the conditions of agriculturally low-performing districts. It includes rainfed districts. Even in irrigated areas, owing to poor performance of irrigation projects, and inadequate infrastructure development, conditions of rural poor has not improved on expected levels. Most of the India's foodgrains are produced only in a few districts. Majority of the growth in foodgrain production is high in these districts. These statements are frequently heard in foodgrains related seminars, workshops and conferences. This study is an attempt to identify those districts to determine if they are really as important as one hears, and if they are, to learn the nature and significance of the factors responsible. This report comprises two parts. In the first, the all-India picture is provided, wherein the top 50 districts are considered. In the second, food production at the district level in Karnataka State has been discussed.

### **Background**

The remarkable change in Indian agriculture was a result of vigorous policy interventions in the years following independence. The post-independence period is often divided into the pre-Green Revolution (1949-50 to 1964-65) and post-Green Revolution (1967-68 to 1996-97) periods. In the pre-Green Revolution period, the two main planks of agriculture policy were land reforms and large investments in irrigation infrastructure. As a result, there took place a visible acceleration in the growth rate of Indian agriculture (Bhalla and Singh, 2001). The introduction of new seed-fertiliser technology during the mid-1960s was a major breakthrough that transformed the rural scenario in India. During the early phase of the Green Revolution, from 1962-65 to 1970-73, the new HYV technology was more or less confined to Punjab, Haryana and a few districts in western Uttar Pradesh. Its introduction brought about some major changes in the nature and pattern of agricultural development in India. One of the key changes, besides many positive aspects, was these developments have led to increased regional disparities. It was mainly those districts with good infrastructure like water resources, and easy access to rural infrastructure and institutions, that were able to record higher benefits of the green

revolution.

The performance of Indian agriculture at the district level has been studied by first combining various districts according to the yield levels and then by looking at the changes in the share of area and output under each category for various periods. Indian agriculture is very much characterised by both inter-personal and inter-regional disparities. Inter-personal disparities have arisen primarily because of skewed distribution of land ownership owing to the failure of land reforms in general and legislation pertaining to ceilings on landholdings in particular. Inter-regional disparities exist because of differences in agro-climatic conditions and in resource endowment, mainly in terms of irrigation and other rural infrastructure. There was a widespread expectation that the new technology would lead to an increase in inter-personal inequality. Moreover, being highly irrigation intensive, the new technology was also expected to bypass the rainfed regions, thereby accentuating regional disparities.

## **Objectives**

- a. To identify the factors and the extent to which they determine the position of certain districts either at the top or at the bottom of foodgrain production in the state.
- b. To ascertain the extent to which macro-level policies and programmes influence the ability of these top or bottom districts to retain their ranking?

## **Methodology and Constraints**

Analytical procedure was carried out at two levels: First, at the all-India level, the top fifty districts were ranked based on foodgrain production for two periods. One, 1972-73 through 1974-75, and second, 1982-83 through 1984-85. Districts lost in the second period and districts that entered in the second period were also listed. Linear regression was run to understand the significance and influence of each dependent variable on foodgrain production in these districts.

Most of the database support was supposed to come from the Agro-Climatic Regional Planning Unit of the Planning Commission, based in Ahmedabad. However, owing to their office closure on a permanent basis, we could not get data for the third period, i.e, triennium ending 1994-95 and most recent year, preferably 2001. On the other hand, owing to financial constraints, it was not possible to visit other regions to get both crop data and dependent variables database.

Second, at the Karnataka State level, analytical procedure was followed in three stages. Third, the database includes i) independent variables, ii) dependent variable, iii) rural infrastructure facilities availability

## **All India**

The analytical procedure used in this part comprises four stages. In the first stage, the top 50 districts are listed based on foodgrain production data for a three-year period including crop years 1972-73 through 1974-75 (hereafter referred to as first period), and 1982-83 through 1984-85<sup>1</sup>

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<sup>1</sup> Data for more recent triennium were not readily available.

(hereafter referred to as second period). The second stage shows those districts that appeared in both periods, districts that dropped out in the second period and new ones that entered into the second period. The third stage is an attempt to narrow down the total foodgrains to major food crops in terms of the top 50 districts' share and changes, if any, in area under production. In the fourth stage, a linear regression was run to understand the significance and influence of each dependent variable on production of foodgrains in these top 50 districts.

In the next round of analysis an attempt was made to introduce change in one variable keeping other variables constant to foresee the changes in foodgrains yield per hectare.

## **Part-II**

### **Karnataka**

Agriculture and allied activities in Karnataka have accounted for 37 per cent of the state income, and 69 per cent of the population are engaged in this sector. Within the sector, crop husbandry accounted for 34 per cent of the output, 32 per cent of the state income and 25 per cent of the employment generated by the sector. The dominant role of this sector in the state economy as core contributor is quite clear even ignoring the estimates relating to its forward linkages. The growth rate in agriculture, which was quite commendable till the end of 1970s, decelerated during 1980s. The production of foodgrains also allegedly stagnated. Productivity was low, both under rainfed as well as under irrigated agriculture, during the eighties. This was attended to immediately by taking quick policy steps. In the eighth plan period, the emphasis was on integrated watershed development, strengthening the infrastructure base and ensuring adequate supply of inputs.

During the late eighties and early nineties, the State achieved recovered from stagnation. This was the time when the state also brought out a policy document for agricultural sector covering major aspects. In the soil conservation sector, National Watershed Development Programme was implemented during the nineties along with some externally aided projects. Participatory process and integrated development of watersheds have become the key components of these projects. These components have given the required fillip to rainfed agriculture in the State. Since 1997-98, the emphasis of the State's policy has been on high-tech agriculture.

The sub-regional analysis indicates:

- Districts with comparative advantage with foodgrain and non-foodgrain crops have not fully utilised their potential.
- Lack of efficient use of resources such as irrigation, fertilisers, credit and other inputs has led to low agricultural performance. Some districts like Belgaum and Bellary have good surface irrigation facilities, yet their yield levels are low. Groundwater scarce districts are opting for overexploitation, resulting in higher cost of production.

## Extremes in Foodgrain Production

1. Over the last four decades the top five districts have contributed nearly half of Karnataka State's total foodgrains, and the bottom five districts produced around seven per cent. Significantly, all the top five districts, namely, Gulbarga, Bijapur, Dharwar, Raichur and Belgaum, are located in north Karnataka. The bottom five districts are mostly located in Malnad region, except Bangalore urban district.
2. The above picture changed slightly by the end of 1998-99, mainly owing to splitting of districts from 19 to 27 in the year 1998. Two things have happened in the process. One, increase in the number of districts has reduced the share of hitherto pivotal districts and also other districts. Two, districts concentrated with irrigated belts reached the top five districts slot, e.g., Davangere and Mysore. Similarly, coastal districts entered into the bottom five districts slot. E.g., Udupi.
3. Large flat tracts of lands with good or some irrigation (either from surface or groundwater) facilities facilitated higher level of foodgrains production in the top five districts. On the other hand, districts with hilly terrain and high rainfall had lesser area under foodgrains, and thereby fall in the bottom five districts category. These districts are Kodagu, Uttara Kannada, Dakshina Kannada, Chickmagalur and Shimoga.
4. An examination of the factors that caused these top five and bottom five districts to retain their position is revealing.
  - North Karnataka districts have traditionally had a comparative advantage in production of pulses. This has helped Gulbarga to retain its highest share as a percentage to the State's total pulse production.
  - Bijapur and Belgaum have continued their supremacy in cereals production over the years.
  - On the other hand, the bottom five districts have both climatic and physical constraints in producing the larger share of the State's foodgrains. But these districts have made overcome their conditions by opting for lucrative plantation crops.
  - Gross cropped area as percentage of state total gross cropped area has remained at a higher level in these districts. Also because large geographical size of these districts makes a difference. It is the latter which also affected their pivotal position, when districts were split up.
5. The top five districts, over the decades, have continued to retain their major share in gross cropped area (50-56% of the state total), foodgrain production (50-53%) and declined in the share of cereals (from 56% to 49%) and picked up in pulses share (from 49% to 60%). By 1999-2000, in all these parameters, carving out of new districts has affected the hitherto top five districts share. But in the case of pulses, the top five retained their share (59%).
6. Foodgrain yield across the districts in Karnataka varies from 559 kg/ha in Gulbarga to 2864 kg/ha in Davangere. In terms of districtwise share as percentage of state total foodgrains production the

lowest share is that of Kodagu district (0.92 per cent) and the highest is that of Davangere (9.71 per cent). Both crop yield levels and district level foodgrain production indicate that Davangere is on the top of the list during 1998-99. In both cases, new districts like Davangere owing to its location advantage and Gadag also for the same reason fall in those categories. Davangere is rich by large tracts of land under cereal crops (5.70 per cent of the state total) and high percentage of irrigated land.