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Contribution of High-Yield Seeds to The Production, Yield and Area of Major Food Crop Production

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Abstract

This study aims to assess the contribution of HYVs to the production and yield of main food crops (rice, wheat, bajra, maize, jowar) in Punjab and Pakistan. The study is based in the last 44 years on secondary results. For this reason, a comparison is made between period I and period II of the growth rates of yield, production and area, from period II to period III and from period I to period IV. The study demonstrates that the effect of HYV seed on main food crops in growth, yield and region is mixed. HYVs make a remarkable contribution to wheat production, production area and yield growth. Various micro grade studies have confirmed the growing yield characteristics of new seed varieties in India. The implementation of HYVs led to expansion, in period II, of rice and maize production and return growth rates. In Jowar's case, despite having reduced its area and production in the second period, its yield was increased due to the adoption of HYV seeds.

Key words: Food Crops, HYV Seed, Semi-Log, Yield

Introduction

In Pakistan's economy, food crops occupy an important place, covering 68 percent of a gross crop area. The amount of food grown in Pakistan in Punjab accounted for 45 percent. Wherever wheat is cultivated in over 5902 thousand hectares, it is indisputably a prominent element in the Punjab food crop profile and represents about 84 percent of production[1], [2]. Rice after wheat is more than 1339 thousand hectares and is responsible for more than 11% of food crops. Maize, the third largest food crop in Punjab and after rice and wheat covers more than 346 Thousand hectares and constitutes more than 3 % of the production of food crops. Less than 1 per cent of the production of food crops is made up of Bajra and Jowar, which occupy 303 and 253 thousand hectares respectively [3]. Rating increase characteristics of new seed varieties (HYVs) have been confirmed by various micro level studies in India. They suggest the production per unit of land in HYV farms is higher than in conventional seed varieties[4], [5]. Some of these experiments also found that the potential performance for HYVs was not yet fully exploited due to the difference between the suggested and actual use of certain key inputs. Few of these studies also demonstrate wide variations in adoption rates across various farm sizes. Macro-level analyses are also carried out to analyze the effect of HYVs on yield, output and region levels[6], [7]. Such experiments attempted to quantify the degree of the variability with the introduction of HYVs in terms of yield production. Such experiments have attempted to test the hypothesis that the growth rate of yield will be higher after its implementation, on the basis of evidence from time series. Such tests have shown

that there has been significant improvement only in the production of wheat. The effects of Green Revolution on food production and crop production are mixed, for wheat spectacular, for bajra and maize some improvement and for jowar and rice no improvements[8], [9]. In summary, the severity of the green revolution has been low in India, both in area and in terms of production. There is also very limited scope for the future.Nevertheless, the ignorance that has historically existed of price seed should not be shocking. This represented a greater aversion to modern agriculture because the organic industry relies on healthy seeds and vice versa. Without the other one cannot live or step forward. Therefore, the success in food production must largely depend on the speed with which we can produce good quality high yielding seeds and sell them.Over the seventies, the quality and quantity of crop production have increased considerably.The performance characteristics of HYVs were therefore not fully realized at the macro level. In Pakistan there were no attempts to estimate the contribution of HYVs to the production, yield and region of major food crops. This study is therefore being carried out to assess the contribution of HYVs to the production, production and area of major food crops in Punjab. Rice, bajra, jowar, wheat and maize are the most common food crops [10]. The research has specific goals: Quantify growth rate, estimate variability levels and discuss policy consequences of observed growth rates and variability in crop areas, production and major crop productivity. This study is organized as follows: data and methods are given in Section 1. Section 2 addresses growth rates of three-period food crop production. Section 3 addresses the three-period distinction and ultimately ends Section 4, which provides implications.

1. Data and Methodology:

The study is based in the last 44 years on secondary results. For this reason, a comparison is made between period I and period II with growth rates of production, yields and area of the crops mentioned above, from period II to period III and from period I to period IV. Data concerning Punjab's area, production and output of major food crops were obtained from the Pakistan government Agricultural Statistics, Agriculture, Ministry of Food and Livestock. In this exercise, it is expected, as in the time of pre-technology (HYV), to lead to growth of production per acre, growth in fertilizer use and irrigated area and crop strength. Semi log exponential models have been used to determine compound growth levels of input, consumption and area of major food crops.

Log Yt = a+ bt where,

Y= major food crops prodtion/acrage

a= constant

b=expresses the rate of change and when multiplied by 100 gives the percentage growth rate

t= time variable in year (1, 2… n)

2. Food Crops Production Growth Rates

- **Period-I:**

The food supply was not sufficient at the time of independence and it was important for the country to import large quantities of food grains in order to increase domestic availability. By the end of the 1950s, however, urgent issues such as food scarcity, foreign exchange shortage and industrial development constraints on raw materials were the cause of pushing planners into an agricultural approach. This policy aimed at achieving food independence by increasing domestic production as well as export production as well as reducing underemployment, unemployment and land relationship restructurings.

- **Period-II:**

The transition of government policy that started at the beginning of the 1960s correspond with the arrival of the so-called "green revolution" was emphasized. This revolution began with scientific and technological advances as inputs. During the search high yield varieties of seed were contributed to the agricultural break down by pesticides, fertilizers and farm mechanization as well as continuous increase in additional water.

- **Period-III:**

The agricultural development slowed down during this time. Although key inputs such as high-yield seed varieties, fertilizers and water have become more available, the farm sector has started to experience lower returns as the efficiency of use has not been taken into account sufficient consideration. Therefore the structural inability to incorporate the major contributions to slow agricultural growth was critical in light of the agricultural reforms that had been implemented in the early seventies.

3. Comparison:

The comparison between period I and II, whereas the growth of jowar and bajra products fell by between 0.71 and 0.42% to -1.66 and 0.27% annually, the growth of wheat, rice and maize increased by 5.18, 6.70 and 2.95% per year respectively, from 3.23, 6.19% and 2.71%. The acceleration in the increase in the production of wheat, rice and maize has contributed in the rise in yield. In the event of a jowar the decline in growth in output was caused by a decline in the region growth, whilst in bajra the decline in both area growth and yield per hectare occurred. Whereas jowar, wheat, rice and maize yields per hectares increased from 0.45%,1.47, 0,79 and 0.87% respectively in the years from 3.95, 2.52, 1.53, and 1.97% per year, bajra yields growth decreased from 2,21 to 0,74% per year. Areas of increase per hectare were decelerated to -1.25, 1.23, 4.17, -2.41 and 0.97 percent annually, respectively, of 1.76, 5.39,-1.39, -0.03, and 1.75 percent. The growth rate was 0.97 percent. The principal hypothesis of this section is that the growth rates of development for wheat, rice and maize in period 2 are higher than those of period I, which could be due in part to the introduction of HYV seeds.

3.1. Comparison Between Period II and III:

The annual increase in wheat, rice, bajra and maize production decelerated between time II and III and from 5.18 percent, 6.70 percent, -1.66 percent and 2.95 by 3.09 per year, 0.34 percent and 0.01 percent per year, and accelerated that of jowar from 0.27 percent per year, respectively. For wheat, rice and maize the growth rate of production has decelerated as a result of both area and yield per hectare deceleration, whereas for bajra the growth rate of production has decelerated as a result of the decline in yield growth alone. In the case of jowar, development acceleration was only accelerated by the acceleration in region expansion. The yield growth for wheat, rice, bajra, jowar and maize has decelerated from 3.95 per annum, 2.52, 0.74, 1.53 and 1.97 per annum. The deceleration in yield growth in wheat, rice and maize was the result of degradation of both area and yield growth per hectare while in the case of bajra the deceleration in yield growth was only the result of a deceleration in production growth. As regards jowar, given accelerations in region and output its yield has decelerated. It can be due to pest attack or flood or to both of these declines in yield. While growth in wheat, rice and maize region dropped between 1.23 and 4.17 and 0.97 and 1.16, 1.29 and -0.09% each year, growth in bajra and jowar decreased between -2.41 and -1.25 respectively and-0.66 and 1.01% each year. In the case of wheat, the deceleration of rice and maize in region growth was caused by the decrease in both production and yield growth. The growth speed of the Bajra area is only triggered by the acceleration of development. The main conclusion from this section is that in period III the yield growth rates for wheat, rice, bajra and maize are lower than those in period II, due in large part to decreased production.

3.2. Comparison Between Period I and IV:

A distinction between period I and period IV yield growth rates shows that the growth rates in rice and jowar, wheat, maize and other crops, which can part of the adoption of HYV crop, have improved for the latter time.

4. Improved Seeds Crop wise Regional Distribution:

Here, the variance in the crop path of better seeds in the district has been attempted.

- **Jawar:**

Jawar is the primary plant cultivated in the district that comprises 30.58% of total net sown area. The Parabhani Millet Center associated with PanjabraoDeshmukh Agricultural University has accomplished a major breakthrough in agricultural research involving the HTV Jawar. The agricultural scientists have developed several varieties in the various institutions of the country in recent years. Such organisms have usually been classified into two groups. The first is planted in the season of Kharif and the second in the season of Rabi.

- **Bajara:**

Bajara is another important district food crop. 96,600 hectares are accounted for Bajara. Net sown area is (13.67 percent). In the Indian Agricultural Research Institute, ICPT-8203, MLBH-267, RHRBH-8609, Suburi and PJH52, were the new species of Bajara crops. The field under the Bajara district is estimated to be more than 10,000 hectares in Khatav and Man tahsils and other rash crops are not possible due to the drought in all those Tahsils. In the Tahsils, the moderate area under Bajara (5,000 to 10,000 hectares) is in fact. Because of the predominance of other cash crops, Phaltan, Khandala, Koregaon, Wai, Karad, Patan and Satara and the unfavourable environmental conditions of Jaolitahsil have no reaction to this crop.

- **Groundnut:**

Groundnut d/C Tops are the principal seed oil: this occupies 56.900 hectares (8.05%) of the total area cultivated with a net seed area. The scientists and research centers that are ideal for local environmental conditions produced different seeds for groundnut crops. The credit proceeds to the University of Agriculture, which has grown HYV groundnuts. Initially, the University of Punjab Agriculture produced the M.B groundnut variety successively. Indian Council of Agricultural Research (ICAR) suggested the varietiesC-148 andC-148. In the field of agricultural research, national agricultural universities also play a vital role. Recently at the University of Mahatma Phule, Rahuri in Maharashtra developed various kinds of soil noodles that are appropriate for the local environment. Such varieties offer 25 to 30 percent more yield than the typical M13 species, Karad-4-11, JL-220 (Phule Vyas) and JL-25 (PhulePragati).

- **Sugarcane:**

This covers an area of 53,000 Hectares (7.5 percent of the sown net area). Sugarcane is the main cash crop for this district. CO-86032, CO-8011, was developed by the sugarcane Research Institute at Coimbatore. In 1932 the Maharashtra government created a Research Institute for Sugarcane. It is in Padegaon in Satara district in Phaltantahsil. In successive years the Institute has produced various new forms of cane. The irrigated areas of the district are noted i.e. Karad, Satara, tahsils viz. Phaltan and Koregaon are leading in cultivation of sugarcane. Sugarcane in this region registers a vast area in terms of fertile land and a network of sugar plants that covers over 5,000 hectares. Because of environmental conditions, Scientist has a mild sugar cane history in rest of the tahsils. The sugarcane field of Jaoli, Khatav, Khandala and Man is very small, i.e. less than 1,500 hectares because of insufficient irrigation.

- **Wheat:**

Wheat comprises 31600 hectares (4.47%) of the district's net sown area. New Delhi, the Indian Institute of Agricultural Research has launched a new variety of wheat, Sonalika. Then there's The Institute viz has developed a number of varieties Sona, 5-331, U.P.-301, S.D.

Kalyan. It is shown that water supplies in the irrigated areas of the district are more than 3000 hectares. Low levels are found in the eastern and western parts of the region, i.e. under 1500 hectares of the net seeded area because of the lack of irrigation and uncertain rainfall conditions. The moderate region in Jaoli, Wai and I KoregaonTahsil (3000 to 1500) is observed by the growth of irrigation facilities.

Conclusion

The impact of HYV seeds on growth, yield and area of major nutrient plants is mixed in Punjab, according to this exercise. HYVs make a tremendous contribution to wheat production, yield and area increase. In the second period, the introduction of HYVs helped speed up rice and maize production growth and yield. For Jowar, although its area and production declined its yield, this could be attributed to the adoption of HYV seeds, increased in the Second period. The following steps are necessary in order to improve the region, production and output growth rate:

- Development information should be made available through the internet, such as the national newspapers, the radio, television and magazines, directories, booklets and more.
- New research emphasis needs to be put on the production of highly stable high-yield varieties suitable both for precipitation and irrigation areas.
- All efforts to improve crop management practices and the use of input are needed.
- Timely and in guaranteed amounts essential inputs should be made available
- Mixed cropping should be promoted.
- Farmers should also be equipped with appropriate credit facilities
- In the villages training programs on production technology and the use of agricultural instruments should be organized on a broad scale.
- Growth in marginal development areas should be expanded.
- The farming community should be provided with extension facilities.

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