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ECONOMICS OF GROWTH AND INSTABILITY: FRUIT CROPS OF INDIA

Kailash Chand Bairwa*, Rajesh Sharma and Taresh Kumar*****

ABSTRACT

The role of fruit crops should not be underestimated in the development of process as they generate more employment and income, in horticulture sector of agricultural and applied sector. Major fruit crops viz., mango, banana, papaya, grapes, citrus, guava, apple and pineapple are very important in Indian economy, as they are economically and politically associated. Horticulture continue to be the major source of income for most of the population, and crucial dependence of its rural labour force on vulnerable agriculture less likely to reduce in the near future, this paper attempts to examine the performance including the growth and instability of important fruit crops in the light of shrinking resource base and risky horticulture. The results from this study were found that productivity of fruits is almost stagnant over last decade and area and production has been almost double from 1991-92 to 2007-08. Citrus, grapes, papaya and sapota are showing higher growth rate in production. Banana, papaya litchi apple and sapota have shown higher instability in production and banana, citrus, mango and papaya have shown higher change in production from 1991-92 to 2007-08. Relative share of mango in total export from India is continuously decreasing and that of grapes is increasing year by year.

INTRODUCTION

The fruits are very important part of human diet. It is generally stated that standard of living of people of a country can be judged by its per capita production and consumption of fruits. At present India is second largest producer of fruits in the world. India has a large range of varieties of fruit in its basket and accounts for 13 per cent of world's total fruit production. The country is a home to wide variety of fruits due to its various agro-climatic conditions. India is the largest producer of mango and banana and ranks among top ten countries in the world in the production of apple, papaya, citrus, grape, Guava and pineapple. The production of fruits in India rose from 43001 thousand metric tonnes in 2001-02 to 63503 thousands metric tonnes in 2007-08 while the productivity of fruits has increased from 10.7 tonnes per hectare in 2001-02 to 11.0 tonnes per hectare in 2007-08. The major fruits growing states in our country include Uttar Pradesh, Andhra Pradesh, Bihar, Karnataka, Tamil Nadu, Maharashtra, Kerala and West Bengal and other states, which have substantial area under fruit crops, are Gujarat, Assam, Madhya Pradesh and Orissa.

The per capita consumption of fruits in India is only around 46gm/day against a minimum requirement about 92g/day, recommended by Indian Council of Medical Research and National Institute of Nutrition, Hyderabad. Total area of all fruits in India is also increased from 4010 thousand ha in 2001-02 to 5775 thousand ha in 2007-08. It is grown extensively in Uttar Pradesh, Bihar, Madhya Pradesh, Maharashtra, Andhra Pradesh, Tamil Nadu and Karnataka. Trade in fruits has become steadily more important over the last decades. The composition, volume, and direction of this trade have changed as incomes and insistence on quality have grown on the demand side, while technology and trade agreements have influenced the supply side (Mathur, 2001). The export market for fresh fruits is highly competitive among the top exporters. Gaining access to foreign markets is critical to countries that are large exporters. Free trade

* PG Scholar, Department of Agricultural Economics, College of Agriculture, SKRAU, Bikaner.

** Director, Institute of Agri-Business Management, SKRAU, Bikaner.

*** PG Scholar, Department of Agronomy, College of Agriculture, SKRAU, Bikaner.

agreements are one means to provide increased market access and encourage increased exports. In addition to negotiating trade agreements, top exporters also use various export promotion and marketing techniques to increase their market share in foreign markets (Larson et. al, 2008). The specific objectives of this study were: to study the production performance of major fruit crops in India, to examine the instability in production of major fruit crops and to analyze the trends in exports of major fruits and its challenges in India.

RESEARCH METHODOLOGY

The current study made use of secondary time series data on area, production and productivity from 1991-92 to 2007-08 was collected from various issues of Horticulture Database of National Horticulture Board, Department of Agriculture and Co-operation and the trade performance time series data of fruit crops from Agricultural and Processed Food Products Export Development Authority (APEDA) to study the growth and instability in fruit production in India.

Compound Growth Rate:

The production performance of main fruit crops in the India was examined by estimating compound growth rates for area, production and yield as follows:

$$Yt=Abt$$

Where,

Yt = Area/Production/yield in tth period, b=1+r and r = Compound growth rate of Y, A=Initial year area/production/yield and t = Time in years

After log transformation and estimation of the above function as ln Yt = ln A+ t ln b, compound growth rate has been estimated as;

$$r = \{antilog (ln b) - 1\}*100$$

Instability Index: Cuddy-Della Valle Index:

The instability in production of main fruit crops in India was examined by estimating Cuddy-Della Valle Index for area, production and yield. To measure the instability of economic variables, Cuddy-Della Valle index (corrected coefficient of variation) is used which takes in to consideration the long term trend. Therefore, to examine the extent of risk involved in fruit production, the instability in the fruit crops' area and production in the India was estimated using Cuddy-Della Valle Index as:

$$I=CV*(1-AdR^2)0.5$$

Where,

I =Instability index (per cent); CV =Coefficient of variation (per cent); and AdR= Coefficient of determination from a time trend regression adjusted by the number of degrees of freedom.

RESULTS AND DISCUSSION

The main focus of this paper is to examine how year to year fluctuations in area, production and productivity of fruit crops in India and what is the effect of newly ongoing horticultural development programmes on the its instability and export performance. The data shows the major fruit producing countries of the world where India was stand at second in area and production of fruit in the world with 5.79 million hectare area and 94.42 million tones production respectively. The productivity in India was much little than Brazil and USA but higher than China.

The share of major fruits in world fruit production has been presented in various references which show that India is the largest producer of mango, Papaya and banana. About 41 per cent of world's mango, followed by papaya and banana contributed about 30 per cent and 29 per cent respectively in world's fruit production. In case of total fruit production India is contributed about 13 per cent of total world fruit

Area and production of fruit crops in major states and India

On account of prevalence of diverse agro-climatic conditions and reach variability available in genetic resources, India can become the largest producer and exporter of horticultural crops. India leads the world in the production of mango, papaya, sapota and banana. In India fruits are playing very important role in total horticulture production. The area and production of fruits crops in India were increasing impressively over the years. The increase in the area and production was more during Triennium-ending of 2003-05 and 2006-08. The productivity of fruit crops was almost stagnant over

the period.

The area and production under major fruit producing states is self explainatory. The area under fruits cultivation in the given major states had increased over the period during 1991-92 to 2008-09. The share of Maharashtra and Andhra Pradesh in total fruits area of India were increased from 0.56 per cent to 24.4 per cent and 7.63 per cent to 15.14 per cent respectively, during this the period of 1991-92 to 2008-09. In case of fruit production, this has been reached just double in Andhra Pradesh, Gujarat, Tamil Nadu and Utter Pradesh during same period. The share of Maharashtra, Andhra Pradesh and Tamil Nadu in total fruit production of India was higher than other states.

Compound Growth Rate:

The current status and growth performance of major fruit crops have been analysed for country. During the period 1991 to 2007, the compound growth rate was examined in area, production and productivity of major fruits in India and it was found increasing. The area under sapota was registered highest CGR of 11.74 per cent followed by citrus (4.98 per cent), mango (4.58 per cent) and lowest in apple. In the case of production highest CGR was also in sapota 7.26 per cent followed by grape (6.98 per cent), papaya (6.91 per cent) and lowest in mango (2.26 per cent). Whereas in productivity CGR was highest in papaya 4.37 per cent followed by grape 2.41 per cent while negative productivity in some perennial fruits like guava, sapota and mango.

The variation in area, production and productivity of major fruit crops has also been analysed. The variation in area was observed to be maximum in sapota (21.65 per cent), followed by citrus (7.82 per cent), apple (7.46 per cent), and lowest in pineapple (3.57 per cent). In case of production maximum variability was observed in banana (14.82 percent) followed by Papaya (13.97 per cent), litchi (13.76 per cent) and lowest in guava (6.95 per cent). As far as yield is concerned the variability was very high in litchi (17.85 per cent), followed by apple (14.08 per cent), grapes (10.53 per cent) and lowest in guava (4.00 per cent).

Decomposition Analysis:

The analysis of factors affecting the total production of major fruits indicates that the area effect is maximum in sapota (214.63 per cent), followed by mango (202.41 per cent), guava (111.54 per cent) and lowest in papaya (30.97 per cent). The contribution of productivity is maximum in papaya (46.46 per cent), followed by litchi (39.63 per cent), banana (36.16 per cent) whereas productivity contribution is negative in various fruits like sapota, mango, guava.

Exports of horticultural products are dependent on factor such as domestic production and consumption, exportable surpluses, consumer preferences, varieties traded, quality, domestic and international prices and availability of infrastructure facilities for storage, post harvest handling, etc. having regard to the social and economic importance of the agricultural sector, the export storage of the government is based on the premise that foreign earning from this sector should be enhanced thereby leading to higher income to farmer, taking care to make agricultural products available at reasonable prices to the domestic consumers.

Among fruits mango and grapes were main exported fruits. The APEDA has initiated a programme for an integrated training of horticulture producers of some identified fruits such as grape mango, litchi, kinnow in the selected regions. The farmer have been provided training on integrated post harvested management practices for better handling of the produce to ensure the export of quality products. APEDA is also making effort to enhance the shelf life of fruits such as grape, mango, and litchi through the use of controlled /modified atmosphere storage and use of refrigerator containers so that they could be transported by sea freight and achieve higher competitive advantage. In order to improve the quality of fruits, pre-harvest manuals for certain fruits has been prepared for dissemination to the farmers and producers.

The reports show the export trend of fruits from India in last decade. Mango and grapes are contributing maximum in total export of fruits from India. Total export of fruits in 1998-99 was about 101.75 thousand metric tonnes which reached at about 359 thousand metric tonnes in 2007-08. Mango occupied a premier position among fruits.

Other fruits, which have attained significant position in export, are grape, citrus (kinnow), banana and apple. Small quantity of a number of other fruits, e.g., litchi, guava, pineapple and papaya are also in demand in the export market. There mango is a major exporting fruits from India in which Alphanso variety highest demanded followed by Kesar.

Challenges for Exports of Horticultural Products:

The challenges posed by the standards have manifested themselves in different ways (World Bank, 2006) for Indian horticulture and these include:

A. Temporary losses due to rejected and sometimes destroyed consignments of fresh or processed products;

(a) Onion consignment rejections in Europe,

(b) Border rejections of many small consignment of processed fruits and vegetable

(c) Grape consignment rejections in Europe, and

(d) Periodic price discounts by private buyers.

B. Higher consignment-specific or recurrent transaction costs due to duplicative testing, high levels of entry point inspection or further treatment of goods upon overseas market arrival;

(e) Pesticide monitoring programme for grapes,

(f) Fumigation of cut flowers in Japan,

(g) Stalled upgrading of mango pulp operations, and

(h) Good agricultural practices and smallholder vegetable growers.

C. Patterns of "defensive commercialization" whereby firms fail to pursue opportunities for remunerative trade with certain countries because of concerns about their inability to ensure compliance with regulatory standards in those markets.

(i) Processed fruits and vegetables sale by small and medium enterprises,

(j) Grape export strategies,

(k) Onion export strategies,

(l) Avoidance of certain cut flower markets

New opportunities in export of fruits from India

Organic farming: There is need to promote organic farming in the production of different fruit crops with the objective of promoting exports and improving returns.

Import substitution: There is vast scope of reducing imports of fresh fruits like dates, nuts like almond, pecannut, pistachionut, macedemia nut, palm oil, raisins, cocoa and rubber. The area under such commodities needs to be increased.

Import intimation system: The need for having adequate, reliable and timely data in respect of import of fruit products has become extremely necessary now in the context of opening up of the economy. There should be on line records about quality, values, and quality etc., of the commodities imported in the country so that both the government and interested entrepreneurs could make use of this information for various purposes.

Intellectual Property Rights (IPR): A patent is a legal monopoly granted to the owner of any new invention, which is capable of being used for limited period of time. It is a privilege granted by the Government to an inventor and other persons deriving their rights from inventions. The patents also stimulate the technology process through diversification of products and up gradation of the technologies.

Constraints in the development of fruits crops

(1) Inadequate post harvest infrastructure and processing facilities: The horticulture and plantation crops are both perishable and non-perishable in nature. Perishability alone contributes to heavy losses in the availability and quality after harvest of crops and makes investment risk oriented. The post-harvest handling accounts about 20 to 40 per cent of the losses at different stages of marketing of both fresh and processed products. Such an enormous loss has proved a great handicap in exploiting the full production potential of these crops and thereby improves the rural income, employment and nutrition of the masses. The week processing infrastructure, as it exists today, has been one of the contributing factors for ineffective utilization of the raw material resulting in huge post-

harvest losses. Lack of sufficient processing units for production of quality output is a major bottleneck for these crops.

(2) Poor marketing infrastructure: Marketing of horticultural produce is a major constraint in the production and disposal system and has a major role to play in marketing the industry viable. Fruits and vegetables are mostly marketed through commission agent. A very small portion is handled by co-operative marketing societies. In the case of some fruits, the owners to the pre-harvest contractors also auction vegetables and flowers.

(3) Post harvest losses: The horticulture produce suffers from heavy post-harvest losses in the absence of adequate post-harvest and marketing infrastructure, viz., pre-cooling units, packing and grading sheds, short and long term cold storage facilities, refrigerated containers, storage and phyto-saniary facilities at airports. There is considerable loss in the amount of fruits and vegetables produced in India due to improper post-harvest operations, this result in a wide gap between the gross production and net availability. Assuming an average loss of 25 per cent (range varies between 8 to 37 per cent in various crops during different stages after harvest) in all the horticultural crops together, the losses are phenomenal.

(4) Trading and marketing bottlenecks: The trading and marketing structure is very traditional and consists of a long chain of intermediaries. The farm-gate price available to the farmers is only 25 per cent of the retail price under Indian conditions whereas the same is 70 per cent in the case of Dutch and US farmers, where more efficient marketing system is in place.

(5) Farm level sale of produce by small and marginal farmers: About 75 per cent of the farmers sell their produce at the farm level to the village merchants, retailers, bit produces or pre-harvest contractors. They cannot afford to transport their produce to the distant mandies on account of non-availability of transport facilities, high transportation cost, malpractices in the market such as heavy deductions, free samples of the produce, etc.

(6) Credit facilities: The branches of banks have been located in the market area but their mode of operation is similar to other banks and they do not give any preference to farmers/traders. In addition, there is no organized concessional credit available to these farmers.

(7) Market information system: Information regarding demand, supply, price, market outlook, knowledge of consumers' preference, marketing channels and practices are important for marketing of produce, which is limited to the terminal markets only at the moment. There is also lack of knowledge and equipment for grading and packaging of fruits and vegetables.

(8) Large number of commission agents: The small growers are unorganized and lack group action and bargaining powder, as a result these farmers are exploited by the traders. The small and marginal farmers are not attended to properly by the commission agents. These farmers have to wait for a long period for auctioning their produce.

Strategies for augmenting production of fruits: The following strategies are proposed for augmenting production of fruits.

1. Improving productivity and production,
2. Reducing cost of production,
3. Efficient marketing export,
4. Price stabilization,
5. Strengthening of organization support,

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