

# Performance of Fruit and Vegetable processing under Food Sector in West Bengal

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## ABSTRACT

Food processing has been identified as a major thrust area in West Bengal's future industrial development. Fruit and vegetable processing sector is one of the core segments under food processing in Bengal. Development of this sector is critically important to the expansion and diversification of state's agricultural sector. It provides vital linkages and harnesses synergies between the two pillars of our economy, industry and agriculture. Bengal has huge potentials for the growth of this sector in the state. Since economic liberalization, several policy measures have been taken by union and state governments to promote fruit and vegetable processing in the state in particular and in the country in general. But such growth potentials are constrained by several factors. The processing of fruit and vegetable is still at a very low level in Bengal (2.8 per cent) as well as in India (2.2 per cent) against the highest post harvest losses (27 per cent). The main constraint lies behind this with infrastructure, technology, quality measurement and lack of farm-firm linkages. In view of the above facts this paper tries to examine the strengths of this particular sector in the state and highlighting on its existing constraints. The paper also made suggestions to achieve the future progress of this sector in Bengal.

**Keywords:** Fruit and vegetable processing, Post harvest losses; Farm-firm linkages, Liberalization, Level of processing, Diversification of agricultural

Food processing has been identified as a major thrust area in West Bengal's future industrial development. The diversified agro-climate conditions of the state, with six agro-climatic zones, offers extensive and diversified variety of environments for growing a large number of fruit and vegetable round the year and therefore have the capacity to cater the market with various items. Fruit and vegetable processing sector is one of the core segments under food processing in West Bengal where according to FAIDA report of McKinsey the growth potential is one of the highest. The state is the largest producer of pineapple and vegetables, and the second larger producer of potato and litchi, and also a significant producer of mango, mandarin orange and sapota in the country. Rapid urbanization, emergence of smaller nuclear family set-ups where women are

working and spending less time in the kitchen, and rising income levels are bringing about tangible changes in the food habit. The export potential and demand for processed food is also growing rapidly. Labour intensive nature of this sector also plays a pivotal role in a labour surplus state like West Bengal where unemployment is the biggest challenge today. The fruit and vegetable processing have been accorded the status of 'Sunrise Industry' in the country with a number of special relief and incentives.

Despite all such potentials, the processing of fruit and vegetable is still at a very low level in West Bengal (2.8 per cent) as well as in India (2.2 per cent) against the highest post harvest losses (27 per cent) of this particular sector. Many of the developed and developing countries have shown much better performance in processing fruit

and vegetable. Even within India, relative performance of various states and regions like Delhi, Maharashtra, Chandigarh, Goa, Haryana, Rajasthan, etc are much better than West Bengal in this respect.

### **Problem statement**

The questions that arise then: what have been the major constraints to the proper exploration of such a huge potential? What effect had these policy reforms on the growth and performance of this sector? What kind of institutional arrangements are appropriate for overcoming the existing problems? What type of technological interventions and policy supports are needed both in production and processing of fruit and vegetable? The proposed research study is intended to answer all such questions in the context of West Bengal. However, the overall goal of this study is to identify appropriate technology-policy-institutional mix to raise the income of the rural poor through the development of post harvest activities of fruit and vegetable in the state.

### **Objectives of the study**

The specific objective of this study may be compartmentalized under the following heads:

- ❖ To examine the status of fruit & vegetable processing in West Bengal.
- ❖ To examine the impact of major policy changes on the growth and performance of fruit and vegetable processing in West Bengal.
- ❖ To measure the contribution of fruit and vegetable processing activities to household income, consumption, and employment.
- ❖ To identify the technological, institutional, socio-economic and policy constraints to the development of fruit and vegetable processing in West Bengal.

### **Analytical tools**

The study has been conducted in the state of West Bengal. Both primary survey as well as secondary survey has been carried out in this study in order to analyze various objectives of the study. The relevant analysis is carried out by using sample statistical tools. The general statistical tools that have been used for

the purpose of the study are- growth rates analysis, percentage distribution, trend analysis, tables and charts, and regression analysis to identify major factors influencing processing level.

## **RESULTS AND DISCUSSION**

The finding of our study reveals that the performance of West Bengal both in case of production and processing of fruit and vegetable is commendable. A steady growth both in production as well as processing of fruit and vegetable has been achieved by the state since liberalization, particularly in post 2000's. A remarkable increase becomes evident in the trends in production of fruit in the state during post liberalization period. Even, the state has been performing better in case of fruit production compared to national level. Production of fruit in West Bengal has been growing at the compound rate of 5.2 per cent between the periods 1991-92 to 2009-10 while such growth rate at national level is observed at 4.1 per cent only (Table 1). In case of vegetables production, a more or less similar picture emerges in the sense that the compound growth rate in vegetable production (4.58 per cent) in West Bengal exceeds that in case of India (4.53 per cent). In productivity of fruit, the annual compound growth in West Bengal is observed at 1.34 per cent compared to a very poor growth profile at the national level of -0.26 per cent over the period in reference. However, such performance in case of vegetables is found to be relatively at much lower levels compared to the all India picture. This clearly points out that the state has huge raw material base for processing a variety of processed food items.

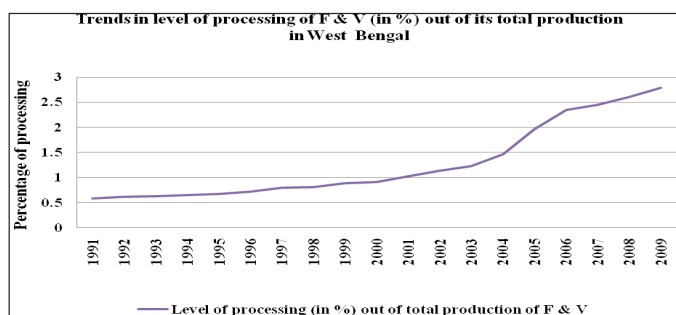
One of the main findings of our research work is that at present 2.78 per cent of total fresh fruit and vegetable are processed in West Bengal which is higher than that of national level of processing (2.2 per cent). The combined growth rate for fruit and vegetable production is estimated at 4.6 per cent in West Bengal while it is remarkable and encouraging to see that the growth rate in processed fruit and vegetable production in the state is observed three times more i.e. 14.0 per cent during 1991 to 2009. The relative performance of the state in terms of fruit and vegetable processing has improved significantly during the last 10 years though the present

**Table 1:** Level of fruit and vegetable processing in West Bengal (Production in 000' Metric Tons)

| Year        | Fruit production | Vegetables production | F & V production (combined) | Processed F & V production | Level of processing (in %) out of total F & V production |
|-------------|------------------|-----------------------|-----------------------------|----------------------------|--|
| 1991        | 1131.70          | 4680.00               | 5811.70                     | 33.71                      | 0.58   |
| 1992        | 1175.80          | 5987.00               | 7162.80                     | 43.69                      | 0.61   |
| 1993        | 1343.80          | 6543.80               | 7887.60                     | 48.90                      | 0.62   |
| 1994        | 1370.90          | 7845.00               | 9215.90                     | 59.90                      | 0.65   |
| 1995        | 1465.60          | 8324.00               | 9789.60                     | 65.59                      | 0.67   |
| 1996        | 1406.40          | 8965.64               | 10372.04                    | 74.68                      | 0.72   |
| 1997        | 1433.60          | 9240.00               | 10673.60                    | 84.32                      | 0.79   |
| 1998        | 1536.00          | 9800.00               | 11336.00                    | 91.82                      | 0.81   |
| 1999        | 1816.13          | 9931.54               | 11747.67                    | 103.38                     | 0.88   |
| 2000        | 1657.10          | 10130.20              | 11787.30                    | 107.26                     | 0.91   |
| 2001        | 1985.50          | 10252.96              | 12238.46                    | 124.83                     | 1.02   |
| 2002        | 1785.60          | 10635.95              | 12421.55                    | 140.39                     | 1.13   |
| 2003        | 2016.08          | 10918.85              | 12934.93                    | 158.33                     | 1.22   |
| 2004        | 2128.30          | 10996.62              | 13124.91                    | 191.59                     | 1.46   |
| 2005        | 2301.70          | 11556.74              | 13858.44                    | 272.24                     | 1.96   |
| 2006        | 2640.54          | 12087.96              | 14728.49                    | 344.65                     | 2.34   |
| 2007        | 2766.67          | 12555.96              | 15322.63                    | 374.59                     | 2.44   |
| 2008        | 2775.60          | 12803.46              | 15579.06                    | 405.00                     | 2.60   |
| 2009        | 2860.92          | 13026.53              | 15887.45                    | 441.41                     | 2.78   |
| <b>CAGR</b> | <b>5.2</b>       | <b>4.5</b>            | <b>4.6</b>                  | <b>14.0</b>                | <b>9.4</b>   |

*Data Source: DFPI & H, GoWB; DF&VPI (ER), GoI and NHB (For data before 2002).*

level of processing is only 2.78 per cent. While at the national level the percentage of fruit and vegetable processing has improved marginally from 2 per cent to 2.2 per cent between 1998 and 2009, in West Bengal it has improved remarkably from 0.88 per cent to 2.78 per cent between the same time periods (Fig. 1).



**Fig. 1:** Trends in level of processing of F & V (in %) out of its total production in West Bengal

*Data Source: DFPI & H, GoWB; DF&VPI (ER), GoI and NHB (For data before 2002)*

Several policies have been undertaken over time both at state level as well as at union level towards horticultural production and processing. We have examined the impact of such policy changes towards growth and performance of fruit and vegetable processing sector in West Bengal. At first in our study we have made a review on the nature of policy changes towards Indian food processing sector since 1960's and it has been observed from the review that food processing sector have managed to get attraction to the policy makers in post liberalization periods. During late 90's, this sector has occupied highest priority to the policy builders. 'The Ministry of Food Processing Industries' (MOFPI) has been established in 1999 in order to promote financial supports and guide to this sector. The fruit and vegetable processing sector has been given the status of 'Sunrise Industry' by Indian government and has been included in the list of priority sector for bank lending in 1999. Establishment of Export Oriented Units

(EOU) under food processing sector has got special focus in this period. While commercial production was a part of major policies during 1990's, the main focus was on the industrial sector which occupied the top position in the priority list. As a result farmers were neglected, even though this period witnessed emphasis on high value crops. Accordingly the food processing sector received a significant weight-age. Policy support for food processing sector could be observed during 2000's. In fact the thrust on 'Food and Nutritional Security' was the major feature of overall strategy in the post liberalization period. A number of hitherto new developments and agendas could be observed in the post liberalization period on account of 'Millennium Development Goals' (MDGs) which was introduced at the policy level. Creation of rural employment was one of the main thrust under MDGs during 2000's. Policies like start of 'National Horticultural Mission' (2005-06; Tenth Five Year Plan) and 'National Rural Livelihood Mission' (2010) gained tremendous importance during 2000's. Moreover contract farming, crop diversification and quality control qualified to be specific interventions during this period. The study has focused on the

profile of specific policies that have been taken by union government as well as government of West Bengal towards fruit and vegetable processing sector in particular since 1990's. Initiatives that have been taken to promote fruit and vegetable processing in the state and incentives and supports provided by the state government towards this sector over time have been highlighted in this study with special care. Moreover, the state government has announced a separate policy for its food processing sector in 2011 in the name of 'The Food Processing Policy 2011'. We have discussed in detail about the features of this policy and also points out the recommendations made out in this policy for promotion of food processing in the state.

The study reveals that the policy interventions in the food processing sector at various levels, especially in late 90's, have created number of positive impacts on its performance at varying levels like investment, income, employment generation, level of processing etc.

A consistent rise in investment towards food processing sector in the state has been observed since 2000's. Total investment in state's food processing which was Rs.79

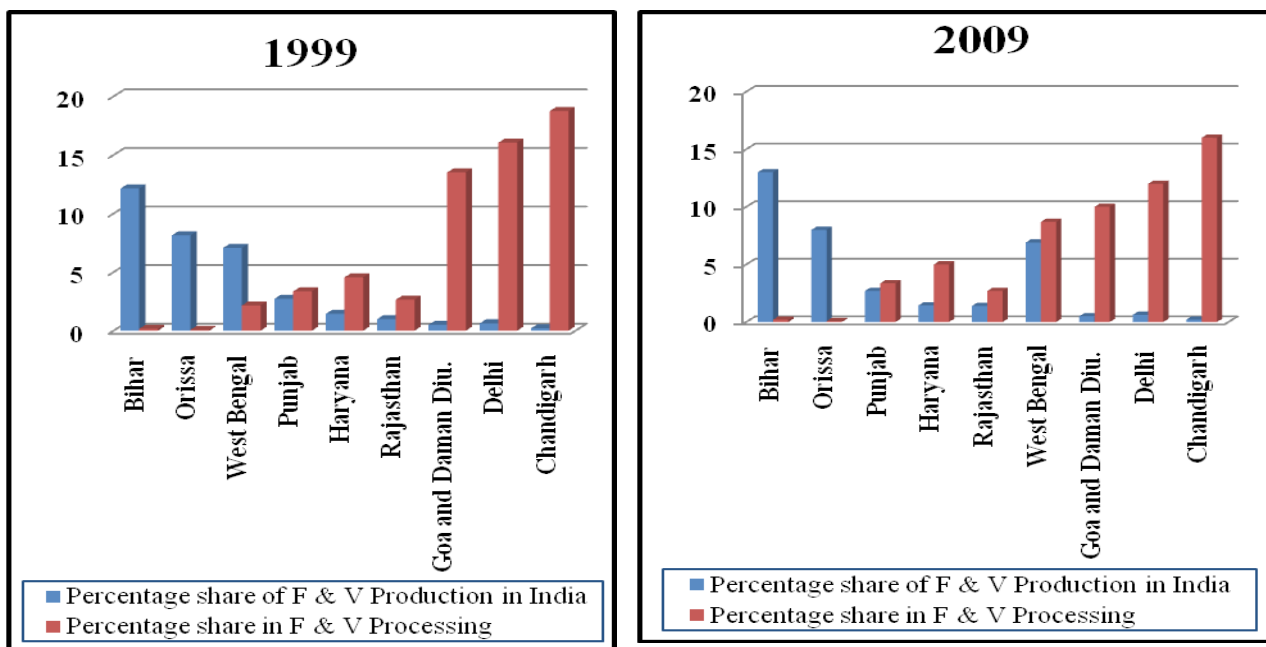


Fig. 2: Relative performance of West Bengal in terms of fruit and vegetable processing

Data Source: Various Secondary Sources.

crore only in 2000-01 stood up by many folds to ₹ 1279.65 crore in 2009-10. Some of the leading corporate houses such as Dabur, Frito-Lay, Venkateshwara Hatcheries and Nestle have initiated projects in the food-processing sector or have started marketing products manufactured in the state. There also has been a noticeable growth in the number of cold storages in the state during the same periods of time.

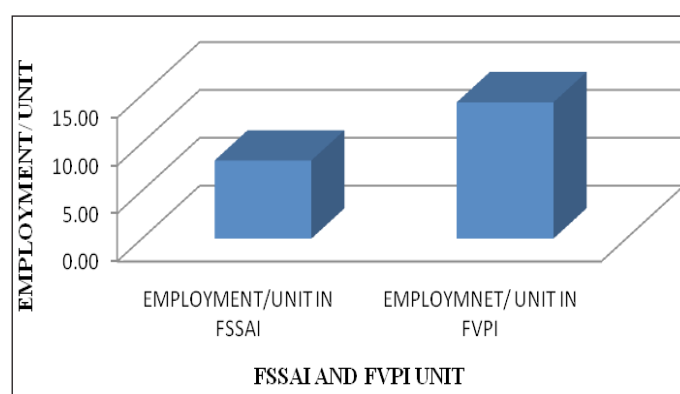
The relative performance of the state, as compared to national average, in terms of fruit and vegetable processing has improved significantly during last 10 years though the present level of processing is only 2.78 per cent. In terms of share in processing vis-a-vis production among the major fruit and vegetables producing states in India, West Bengal's position has also improved substantially during the last 10 years. (Fig. 2).

**Table 2:** Newly registrar FSSAI unit and FVPI units in West Bengal from 2007 to 2012

| DISTRICTS               | FSSAI UNITS  | FVPI UNITS  |
|-------------------------|--------------|-------------|
| Birbhum                 | 200          | 1           |
| South Dinajpur          | 341          | 12          |
| Jalpaiguri              | 488          | 10          |
| Murshidabad             | 347          | 4           |
| Midnapur West           | 620          | 6           |
| Midnapur East           | 621          | 3           |
| Bankura                 | 302          | 1           |
| South 24 Parganas       | 265          | 14          |
| North Dinajpur          | 244          | 1           |
| Coochbihar              | 336          | 2           |
| Hoogly                  | 355          | 11          |
| Howrah                  | 159          | 6           |
| Darjeeling              | 138          | 6           |
| Nadia                   | 319          | 6           |
| Burdwan                 | 354          | 6           |
| Purulia                 | 223          | 2           |
| North 24 Parganas       | 454          | 25          |
| Kolkata                 | 721          | 31          |
| Malda                   | 180          | 19          |
| <b>Total Units</b>      | <b>6667</b>  | <b>166</b>  |
| <b>Total Employment</b> | <b>54459</b> | <b>2366</b> |

Source: DFPI & H, GoWB

About 6667 new food-processing units have been established in West Bengal across the districts during 2007 to 2012, out of which 200 have been launched in fruit and vegetable processing sector. As a result of all such initiatives more than 50 thousand employments has been generated in this sector in the state till 2012 (Table 2). It is noteworthy to mention that per unit employment generation in the state during last five years i.e., from 2007 to 2012, was at a higher rate in fruit and vegetable processing industries (14.25) than food processing industries as a whole (8.17) (Fig. 3).



**Fig. 3:** Employment per FSSAI unit and FVPI units in West Bengal from 2007 to 2012

Source: DFPI & H, GoWB.

In fact new policy thrust of the government towards food processing in general and fruit and vegetable processing sector in particular has initiated a process of structural changes in the composition of FPO units in terms of size and scale of operation. The policies during the post liberalization period have the effect of encouraging the large players (including big corporate houses and Multi-Nationals) to enter the fruit and vegetable processing sector which is indicative of the fact that fruit and vegetable processing has emerged as a profitable outlet for corporate investable surpluses in recent years.

One of the major objective of our study is to identify the technological, institutional, socio-economic and policy constraints to the development of fruit and vegetable processing in West Bengal.



An attempt has been made in our study to highlight the generic constraints to the fruit and vegetable processing industry as a whole in the state and it has been observed that infrastructural and technological constraints are most limiting constraints to growth and development of fruit and vegetable processing industry in West Bengal. Within infrastructure, there exists a high degree of problems in all the areas like poor transportation facilities, lack of cold chain facilities, frequent power cuts, and insufficient investments in research and development. But the growth of processing industry appears to be more constrained because of lack of cold chain facilities and power cuts. In case of technological constraints those related to age-old machinery, poor quality control for export and packaging are the major areas of concern. Poor linkage between the producer farmers and processing firms is another generic constraints faced by the industry which ultimately gives rise to the problems of non-availability of raw materials, high raw materials price to the firms due to involvement of middlemen, and failure to meet the quality standards of the produce. Institutional constraints relating to high tax rates, lack of government support, consumer's sensibility on product brand, and dominance of unorganized units remain more or less at moderate levels while high product price and labour scarcity constitute a relatively more serious problem to the industry.

**Table 3:** Regression model to identify the major determinants of fruit and vegetable processing in West Bengal

| Explanatory variables                                      | Co-efficient |
|--|--------------|
| <i>Dependent variable (percentage level of processing)</i> |              |
| Intercept  | -4.82*       |
| Relative infrastructure index (India=100)                  | +0.02**      |
| % share of urban population                                | +0.09**      |
| Per capita annual income (,000 rupees at 2000-01 price)    | +0.85***     |
| Adjusted R2 value  | 0.82         |

Level of significance-(\* at 1% level; \*\* at 5% level; \*\*\*10% level).

The regression model helps in exploring the major driving forces and principal constraints, which may act as a barrier to the growth and development of fruit and vegetable processing industry in West Bengal. The finding of the model shows that infrastructure, urbanization

and income growth are the major drivers for growth in fruit and vegetable processing in West Bengal (Table 3). The existing infrastructure facilities in the state are found to be concentrated near big cities/ metropolitans that are far away from the producing areas, and this explains why processing units tend to concentrate in areas with better infrastructural endowments rather than where raw materials are produced. However, the overall quantity and quality of infrastructure remain far below the requirements, the future growth and expansion in fruit and vegetable processing in West Bengal depends to a large extent on efforts of the state government in developing the necessary infrastructural facilities particularly in rural areas and in improving agricultural marketing in the state. Again, about 70 to 75 per cent demand for processed food comes from urban people. There seems to be a need to enhance the consumption of processed food in rural areas through the spread of electronic media and strategy to capture the rural market by the processing firms. But high prices of processed foods and low per capita income in rural areas are the restricting forces in exploiting the huge untapped potential for processed fruit and vegetable industry in the state. Therefore industry must focus on reducing the MRP of processed items. Furthermore, the potential rural markets must be explored given the fact that rural sector in West Bengal has been able to enjoy some surplus over the last few decades.

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