

Policy impacts on fruit and vegetable processing sector in West Bengal

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ABSTRACT

Fruit and vegetable processing sector is one of the core segments under food processing in West 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. Several policies have been undertaken over time by union and state government to promote the activities of food processing in general and fruit and vegetable processing in particular in the state. In this paper we have made a brief review on the nature of the policy changes towards this sector and also analyze its impacts. And, it has been observed that the policy interventions 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. The government policies in a new liberal regime have primarily benefited the large scale units which have emerged as the group of new dominant players in the state's processing sector. This sector would gain further strength as the state government very recently has introduced a specific policy package towards this particular sector. Despite of significant growth in this sector in the state, the proportion of production processed commercially has not increased adequately. The main constraint lies behind this with infrastructure, technology, quality measurement and lack of farm-firm linkages. Hence, government should come forward to look after such problems and take appropriate policies according to the needs.

Keywords: Fruit and vegetable processing, post harvest losses, farm-firm linkages, liberalization, level of processing, diversification of agricultural

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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 West Bengal where according to FAIDA report of McKinsey the growth potential is one of the highest. Development of fruit and vegetable processing is critically important to

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the expansion and diversification of the agricultural sector in India as well as West Bengal. Such activities would reduce seasonality of consumption of a range of processed food, minimize post-harvest losses, and increase profitability and sustainability of production systems besides their impact on increasing farm income, rural employment and foreign exchange earnings and reduction in marketing risks (Roy and Ojha, 2012). It also provides vital linkages and harnesses synergies between the two pillars of our economy, industry and agriculture. In West Bengal, there is enormous potential for the growth of this sector. West Bengal is the hub of economic activities in the entire eastern and north eastern India. It has a history of industrial leadership based on abundance of natural resources. Successful agricultural and land reforms have led to sustainable self sufficiency in food grains and milk production and steady growth in vegetable and fruit production. Advantages of six agro-climate zones, fertile soil and proper irrigation facilities make it possible for West Bengal to maintain strong production base in fruit and vegetables. Availability of large pool of educated farm labour and technical manpower at comparative rates in the state is favourable for future growth of labour intensive fruit and vegetable processing sector in West Bengal.

The environment for 'food processing' in general and 'fruit and vegetable processing' in particular both at national level as well as at the state level has changed significantly after liberalization, specifically after 2000's. A series of policy measures has been taken in favour of this sector with regard to regulations and control, fiscal policy, trade, taxation, exchange and interest control, export promotion etc. The fruit and vegetable processing have been accorded the status of 'Sunrise Industry' in the country with a number of special relief and incentives (Roy, 2010). Further this sector has been identified as 'Priority Sector' for bank lending. Despite several incentives and advantages (like the abolition of regulation in the early 90's, and the consequent anchoring facilities provided by MOFPI, APEDA, NHB etc.), the processing of fruit and vegetable is still at a very low level in West Bengal (2.8 %) as well as

in India (2.2 %) against the highest post harvest losses (27 %) of this particular sector. Many of the developed and developing countries like Malaysia, South Africa, Philippines, Thailand, Brazil and USA 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.

In view of the above fact the aim of this paper is to identify the impacts of major policy interventions that have been taken after liberalization (during 1991) towards fruit and vegetable processing sector of the state and also try to suggest further policy interventions, accordingly to the present need of this sector, for its accelerated future growth.

Objectives of the study

The specific objectives of this study are:

- ❖ To identify the major policies that have been taken towards fruit & vegetable processing sector in national level as well as in West Bengal.
- ❖ To examine the impact of such major policy changes on the growth and performance of fruit and vegetable processing in West Bengal.
- ❖ To identify the main drivers to the development of fruit and vegetable processing in West Bengal.
- ❖ To suggest an appropriate policies for an accelerated fruit and vegetable processing in West Bengal.

METHODOLOGY

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. Primary survey has been carried out at industry level. Industry survey has been undertaken on the existing fruit and vegetable processing industries in the state both at organized and unorganized sector through structured questionnaire. We have approached more than 100 relevant processing firms across the state and out of them 55 responded

to us for survey. All responding units (i.e. all of the 55 firms) have been surveyed covering almost all districts of the state out of which 40 units are from organized sector and rest of the 15 are from unorganized sector. In secondary survey, information have collected from various national and state level sources regarding the policies that have taken towards food processing in general and fruit and vegetable processing in particular from time to time in India as well as in West Bengal, time series data on area, production and productivity of fruit and vegetables; food processing units; 'Fruit Products Order' (FPO) units (at the time of survey this nomenclature were adopted) and others information on investment, employment, export relating to this sector etc. have been bring together from various sources at district, state and national level.

Analytical Tools

Part of the research is based on a critical review of policy documents of the state and union government towards fruit and vegetable processing, and part of the research is based on analysis of secondary and primary data. The relevant analysis is carried out by using simple 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 DISCUSSIONS

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 weightage. 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 union government as well as state government has also been taken specific policies towards its fruit and vegetable processing sector from time to time after liberalization, such as- free licensing for the processed food sector; 'Foreign Direct Investment' (FDI) up to 100 per cent is permitted in the infrastructure like Food Park, Cold Chain and Warehousing; reduction in custom duty on fruit and vegetable processing machinery and their parts; exemption in excise duty, service tax, corporate tax, and central sales tax is applicable to this sector. Further, 'Tax holiday' for first five assessment years beginning with the initial assessment year and thereafter, 25 % (30 % for a company) for another five assessment year's tax rebate has been given to undertakings deriving profit from the business of processing, preserving and packaging of fruit or vegetable and establishment of new units in the business of processing, preservation and packaging under fruit and vegetable.

Importance has been given in building up World class infrastructure in processed food sector by setting up Mega Food Parks, Integrated Cold Chain, Value Addition and Preservation Infrastructure, Skill Development etc. The MOFPI has been established a national level institute called 'National Institute of Food Technology, Entrepreneurship and Management' (NIFTEM) at Kundli in Haryana for this purpose. Regarding quality measurement 'Food Safety and Standards Authority of India' (FSSAI) has been established in order to effect the 'Food Safety and Standards Act, 2006, which consolidates various acts and orders that have hitherto handled food related issues in various Ministries and Departments. FSSAI has been created for laying down science based standards for articles of food and to regulate their manufacture, storage, distribution, sale and import to ensure availability of safe and wholesome food for human consumption. 'National Mission on Food Processing' (NMFP) has been launched during 12th plan for effective supervision and monitoring of the ministry's assisted projects. 'Free Trade Zones' (FTZ) and 'Export Processing Zones' (EPZ) have been set up with all infrastructural facilities for this sector.

Government of West Bengal has also taken specific policy measures in order to promote the activities of food processing sector in general and fruit and vegetable processing in particular in the state. 'Department of Food Processing Industries & Horticulture' (DFPI & H) has become operational in the state since 1997. 'West Bengal State Food Processing & Horticulture Development Corporation Limited', wholly owned by the Government of West Bengal, has been set up for implementing various projects of DFPI & H. The state government has also given importance in infrastructural development. Pack Houses' are established at Malda and Barasat, 'Perishable Cargo Complex' facilities are made available at Netaji Subhas Chandra Bose International Airport, Kolkata and will be operational shortly at Bagdogra Airport, in Darjeeling district. At Haldia Port 'Cargo Complex' facility is accessible. Plant Quarantine Station has been established at Kolkata Airport, Haldia Port, Panitanki and Bangaon. At Memari in Burdwan

district 'Potato export facilitation centre' has been set up. An 'Irradiation plant' at Chinsurah, Hoogly, is under construction which would be operational shortly. For better price realization of pineapple an 'Auction Centre' has been developed by the state government at Bidhan Nagar, Siliguri. It should be noted here that Bidhan Nagar at Fanshidewa Block in Darjeeling district is the largest pineapple producing area in the state. Keep in view the storages of fresh fruit and vegetables 11 multi-purpose small cold storages with 20 metric tons of capacity have already been established at different municipal market complex. Further, the state government plans to set up cold storage facilities at each blocks of the state in order to minimize post harvest losses. The state government has already launched five 'Food Parks' at Malda, Sankrail (Howrah), Dankuni, Haldia and Siliguri and one 'Mega Food Park' at Jangipur where food processing industries can get land with all common facilities. 'Fish Food Parks' have been set up at Shankarpur, Chak Garia, Sulanpur and Kakdwip. Quality control laboratory for testing quality of fresh as well as processed food has been set up at Jadavpur University, Kolkata Municipal Corporation PFA Laboratory, Techno India (Kolkata), Bidhan Chandra Krishi Viswavidyalaya at Kalyani and Uttar Banga Krishi Viswavidyalaya at Jalpaiguri. Attentions have been given in 'Research and Development' by the state government specifically in case of development of value added product from potato and pineapple and low cost preservation of vegetables. Training centres for food processing are already in operation in different parts of the state.

State government has announced capital incentive subsidy on fixed capital up to 35 per cent and interest subsidy up to 30 per cent for maximum term of 10 years depending on the size and location of the processing industries in the state. Other subsidies like- Employment generation subsidy; waiver of electricity duty and subsidy on electricity charges; refund of stamp duty and registration duty; subsidy for quality improvement; incentive for plant registration (additional subsidy of 10 per cent for women, SC/ST and SHGs.) -are made available in West Bengal. For promoting the activities

of food processing industries in the state, the state government also provides incentives along with IPA to micro and small scale/large scale units as applicable. Considering the importance and bright future of this sector, West Bengal government has announced a separate policy for this sector in the name of 'The West Bengal Food Processing Policy, 2011'. Principle aims of the policy are to direct state's resources independently as well as through 'Private-Public Partnership' (PPP) for setting up of infrastructures, processing units and industries to produce value added processed food products, reduce wastages, generate additional income for the farmers/growers, create employment opportunities for the unemployed and earn revenue for the overall socio-economical development.

The policy interventions in the food processing sector during the period of liberalization and post liberalization period have brought about a number of impacts on its performance in West Bengal at varying levels. In particular, a series of positive developments following these policy interventions at the macro and micro levels remains evident from 2000 onwards.

A positive trend in investment in food processing sector has been observed in the state after 2000. Total investment in food processing in the state which was only ₹ 79 crore in 2000-01 stood up by many folds to ₹ 787.85 crore in 2010 (Figure 1). 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. Frito-Lay India has set up a unit for manufacturing potato chips with a projected investment of around ₹ 70 crore at Sankrail Food Park, Howrah and Potato King Pvt. Ltd. has a world-class plant at Howrah for production of potato powder with latest technology and machinery imported from Florigo, Holland and the US. The entire production of the plant is fully automatic and the finished goods are untouched by hand. The company has cold storage facilities near the plant in order to supply raw materials at desired and regulated temperatures when there is no availability of fresh, raw potatoes. The company is currently going for further

expansion and setting up another unit. In 2004, the Dabur Pvt Ltd, another food giant in India, has set up a fruit processing plant at Siliguri at an estimated cost of ₹ 20 crore. Pataka Food Products Pvt Ltd also plans to set up a modern fruit and vegetable processing unit at Jangipur, Murshidabad. The company has already purchased about 50 acres of land and civil construction work is about to commence. Keventor Biotech Pvt Ltd signed a MoU with the Department of Food Processing Industries & Horticulture for setting up a unit for exporting fresh and frozen green vegetables. The unit has already come up near Barasat. Similarly, Elque & Co. had also signed a MoU with the Department of Food Processing Industries and Horticulture for exporting frozen vegetables. They have set up their unit at North 24-Parganas with an investment of around ₹ 5 crore.

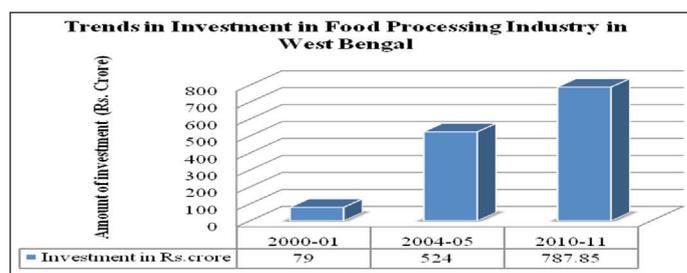


Fig. 1: Trends in investment in food processing in West Bengal

Data Source: DFPI& H; GoWB

About 6421 new food processing units have been established in West Bengal across the districts in the last five years (i.e. from 2007 to 2011), out of which 153 have been launched in fruit and vegetable processing sector (Table-1). As a result of all such initiatives more than 30 thousand employment has been generated in this sector in the state till 2006 and over fifty thousand of employment has been created in food processing sector as a whole during 2007 to 2011, with around fifteen hundred of employment in fruit and vegetable sector alone. Since 2007, a large numbers of new fruit and vegetable processing units have been established in the state particularly in the district of Malda, North and South 24 parganas, Hoogly, Dakshin Dinajpur, and Jalpaiguri. It is noteworthy to mention that per

unit employment generation in the state during last five years i.e., from 2007 to 2011, was at a higher rate in

fruit and vegetable processing industries (9.4) than food processing industries as a whole (8.03).

Table 1: Dist-wise newly registered FPI and FVPI with respective new employment in the state from 2007 to 2011

Districts	FPI	Employment in FPI	Employment/ FPI	FVPI	Employment in FVPI	Employment/ FVPI
Burdwan	354	4741	13.39	6	57	9.5
Birbhum	200	2703	13.52	1	10	10.0
Bankura	302	2047	6.78	1	15	15.0
Midnapur (E)	621	4934	7.95	3	13	4.3
Midnapur (W)	620	3464	5.59	6	54	9.0
Howrah	159	1348	8.48	6	88	14.7
Hoogly	356	3708	10.42	15	58	3.9
24 Parganas (N)	454	3719	8.19	25	249	10.0
24 Parganas (S)	265	2505	9.45	14	66	4.7
Nadia	319	2195	6.88	8	66	8.3
Murshidabad	347	2311	6.66	4	43	10.8
Uttar Dinajpur	244	2026	8.30	1	5	5.0
Dakshin Dinajpur	341	3698	10.84	12	34	2.8
Malda	654	4897	7.49	31	356	11.5
Jalpaiguri	488	2493	5.11	10	63	6.3
Darjeeling	138	1861	13.49	6	184	30.7
Coochbihar	336	1620	4.82	2	65	32.5
Purulia	223	1291	5.79	2	17	8.5
West Bengal	6421	51561	8.03	153	1443	9.4

Data Source: DFPI& H; GoWB

There had been a noticeable improvement in average number of new units and average amount of fresh investment per annum in agro based and food product sector of the state during liberalization and post liberalization periods. While the average establishment of new units per annum in agro based and food sector in West Bengal was 10 during 1991-94, it jumped up to 67 during 2006-09 (Table-2). On an average, 28 new units were established every year since 1991 to 2009 in this

particular sector in the state. In case of average fresh investment per annum it increased from rupees 51 crore during 1991-94 to rupees 591 crore during 2006-09, thus average of rupees 214 crore fresh investment per annum has been registered to this particular sector since 1991 to 2009. The importance of agro based and food products sector in total industrial activity in the state both in respect of new establishment and fresh investment has been observed after liberalization.

Policy impacts on fruit and vegetable processing sector in West Bengal

Table 2: New units and investment trend on agro based and food product sector in West Bengal since 1991

Sl No.	Sectors	Average number of new units/annum				Average amount of fresh investment/annum (in Rs. crore)			
		1991-1994	1995-2005	2006-2009	Total (1991-2009)	1991-1994	1995-2005	2006-2009	Total (1991-2009)
1	Agro based and food products Sector	10	23	67	28	51	150	591	214
2	Total industrial activity in W.B.	75	92	248	116	1999	2120	5360	2665
	Percentage share of 1 in 2	12.7	25.2	26.9	24.3	2.5	7.1	11.0	8.0

Data Source: Quarterly Bulletin on Investment, Industries and Trade in West Bengal; GoWB

The share of agro based and food products sector in total industrial activity in respect of average new establishment increased from 12.7 per cent to 26.9 per cent from 1991-94 to 2006-09 and this share in respect of fresh investment per annum has also been increased from only 2.5 per cent to 11 per cent during the same reference periods. It becomes evident from the fact that agro and food sector has got greater importance both in terms of new establishment and fresh investment in total industrial activity in the state after 2000's onwards and it is clear that the specific policy provisions directed to the food processing sector in West Bengal has certainly provided a positive boost to it over the last few years.

Compared to 1990's the fruit and vegetable processing in West Bengal displays remarkably impressive

performance during 2000's. There have been enhancements in absolute production of both fruit and vegetables over the period 2001 -09 as well as a remarkable jump in the amount of processed fruit and vegetable production (Table-3). Again, the compound annual growth rate in processed fruit and vegetable production is observed as high as 17.57 per cent after 2000's compared to 12.58 per cent during the first half of economic liberalization. More interestingly while the level of processing in the state out of total production of fruit and vegetables was below one per cent in the first phase of economic liberalization, it came over to two per cent with a consistent rise during 2000's. And, in 2009 the level of processing of fruit and vegetable reached at 2.78 per cent which is above the national average of 2.2 per cent only.

Table 3: Comparative performance in 1990s vis-à-vis 2000s of fruit and vegetable cultivation and processing in West Bengal

Period 2001-2009				Period 1991-2000			
Production in 000' Metric Tons				Year	F&V Production	Processed F & V production	Processing level (in %)
Year	F&V Production	Processed F & V production	Processing level (in %)				
2001	12238.46	124.83	1.02	1991	5811.70	33.71	0.58
2002	12421.55	140.39	1.13	1992	7162.80	43.69	0.61
2003	12934.93	158.33	1.22	1993	7887.60	48.90	0.62
2004	13124.91	191.59	1.46	1994	9215.90	59.90	0.65
2005	13858.44	272.24	1.96	1995	9789.60	65.59	0.67
2006	14728.49	344.65	2.34	1996	10372.04	74.68	0.72
2007	15322.63	374.59	2.44	1997	10673.60	84.32	0.79
2008	15579.06	405.00	2.60	1998	11336.00	91.82	0.81
2009	15887.45	441.41	2.78	1999	11747.67	103.38	0.88
CAGR	3.63	17.57	13.94	2000	11787.30	107.26	0.91
				CAGR	7.36	12.58	5.22

Data Source: DFPI&H; GoWB and NHB

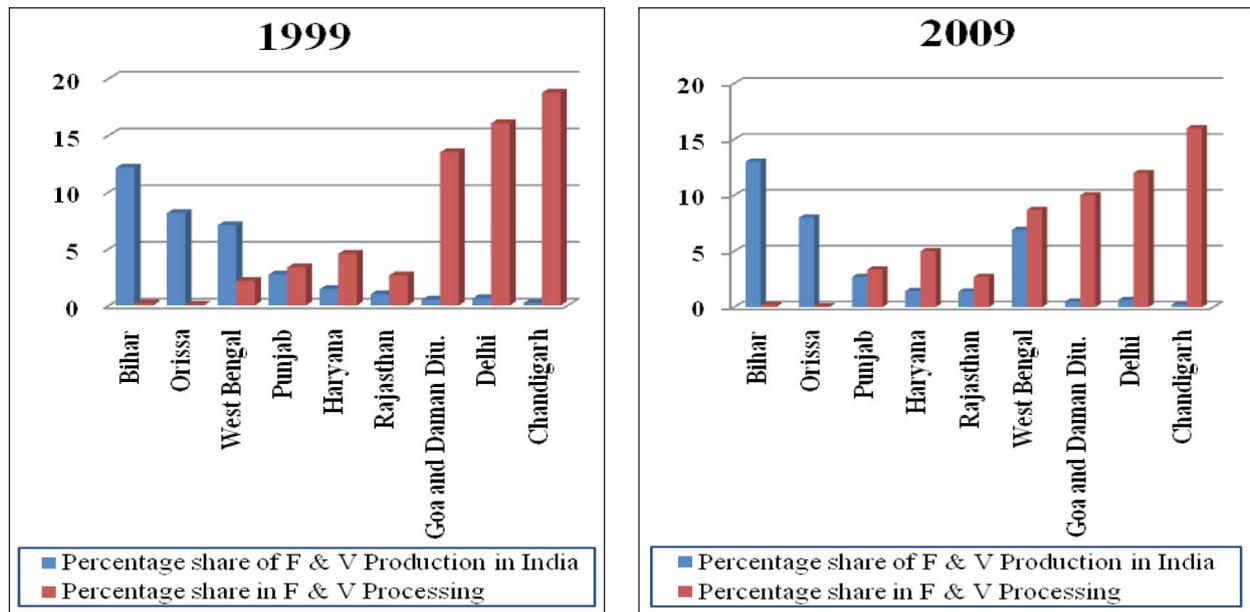


Fig. 2: Relative performance of West Bengal in terms of fruit and vegetable processing

In West Bengal, level of processing has increased more than double between last ten years and this is much impressive performance than that achieved at national level at the same time periods. In case of percentage level of processing of fruit and vegetable, the compound annual growth rate increased more than two fold being 13.94 per cent during 2001-09 as compared to just 5.22 per cent during 1990-2000. 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 improved substantially during the last 10 years (Figure 2).

A consistent growth in fruit and vegetable processing units with Fruit Products Order (FPO) in West Bengal has also been observed after liberalization. While in 1991 there were 242 FPO units in the state, it grows at 269 in 2000 and at 342 in 2011 (Table 4).

Table 4: Structural change in the composition (size groups) of FPO units in West Bengal

Category scale (Tonne/Annum)	1990		2000		2005		2010	
	Units	Per cent share						
Large Scale (>250)	16	6.81	20	7.52	24	8.22	32	9.88
Medium Scale (100-250)	13	5.53	15	5.64	22	7.53	27	8.33
Small Scale (50-100)	18	7.66	20	7.52	21	7.19	23	7.10
Cottage Scale (10-50)	62	26.38	67	25.19	69	23.63	73	22.53
Home Scale (1-10)	89	37.87	102	38.35	111	38.01	122	37.65
Relabellers (<1)	37	15.74	42	15.79	45	15.41	47	14.51
Total	235	100.00	266	100.00	292	100.00	324	100.00

Source: MOFPI; GoI

Policy impacts on fruit and vegetable processing sector in West Bengal

The state's share in FPO units in India also increases from below four per cent to above five per cent from 2000 to 2011 (MFOPI; GoI). More importantly the new policy thrust of the government to this sector 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 in to 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 investment in recent years. The share of medium and large scale units improved significantly over time. In case of large scale units the percentage share increased from 6.81 % to

9.88 % between 1990 and 2010 in aggregate existing units in the state. Although this sector is still dominated by cottage and home scale business units, the new policy environment concerning to this sector might have given more emphasis in favour to larger players. The emerging significance of large scale units is also corroborated by our findings based on a primary survey of 55 industries across different size groups in the state.

We have attempted to know from the surveyed firms regarding the 'generic' impact of specific policies taken towards food processing sector and it reveals that almost all major policies taken towards food processing sector by the state as well as union government have a positive retort on processing firms (Table 5).

Table 5: Generic impact of policy changes on FVPI sector in West Bengal

Types of impact (in percentage) Policy measures	Positive impact			No impact	Negative impact		
	High	Moderate	Low		Low	Moderate	High
Tax holidays/concessions		36.4	18.2	9.1	27.2	9.1	
Free import of capital goods	9.1	45.4	36.4	9.1			
Capital incentive subsidy	36.4	27.2	18.2	18.2			
Promotional schemes	9.1	54.5	36.4				
Waiver of electricity charges	36.4	45.5	18.1				
Waiver of stamp duty etc	45.5	45.4	9.1				
Scheme for EOU/AEZ etc	9.1	54.5	36.4				
NREGS				9.1	27.3	36.4	27.2
De-licensing		63.6	36.4				
Permission of foreign brand/capital			54.5	18.2	27.3		
Contract Farming (Expected)	54.5	36.4	9.1				
Single window approach (Expected)	45.5	54.5					

Source: Field survey by the author

Policies like capital subsidy scheme; waiver of electricity duty; waiver of stamp duty; and de-licensing policies are perceived to have a very high degree of positive impacts. We have also tried to know during our industry survey what would be the possible impact of policies like 'contract farming' and 'single window approach' to this sector, if such policies will

be adopted by the state government as done in many states like Punjab, Haryana, Madhya Pradesh etc. And it is quite interesting to note that the surveyed firms have expressed their strong support in favour of such policies and also made it clear that such policies should immediately be adopted by the state government at least for fruit and vegetable cultivation where post

harvest loss and market risk is too high. The industry is very much eager for a favourable policy decision to allow contract farming in fruits and vegetables. Other policy interventions like establishment of EOU/AEZ; free import of capital goods for export, and different promotional scheme like generic advertisements by the governments, etc perceived to have moderate positive impact in West Bengal. Interestingly 'National Rural Employment Guarantee Scheme' (NREGS) is found to have negative impact as it gives rise to labour shortage constraint to the industry. The perception regarding the policy of tax holiday/concession is mixed as it is applicable to new set ups only. There is some confusion among the surveyed firms regarding permission for use of foreign brand and allowing foreign capital in terms of foreign direct investment (FDI) to this sector. The perception regarding this policy intervention is mixed. A large numbers of firms welcomed this policy intervention but others are in apprehension due to their inability to compete with foreign brand and foreign companies.

Table 6: Regression model to identify the major determinants of fruit and vegetable processing in West Bengal

Explanatory variables	Co-efficient
Dependent variable (percentage level of processing)	
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)

Despite all these initiatives and advantages, 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. Against this fact we have prepared a regression model in our study to identify the major driving forces and constraints as well of state's fruit and vegetable processing industry and to suggest policies accordingly. 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-6). 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. However, with an income elasticity of demand in the range of 1 to 3 per cent along with persistent growth in per capita income is expected to provide a significant boost to the demand for processed food in rural areas too. 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.

Keep in mind the entire analysis with regard to fruit and vegetable processing sector in West Bengal a number of significant interventions on the policy front are needed to integrate different policy measures in a more effective and consistent chain of impact consequences. In that, the most desired and urgent changes in the existing policy structure may be suggested as follows.

- A. In order to promote export and confidence of domestic consumers it is necessary to introduce environment friendly stringent food safety and quality law. The organized sector should be brought under the compulsion of making compliance to

such requirements and standards as 'Sanitary and Phyto Sanitary' (SPS), 'Hazard Analysis and Critical Control Points' (HACCP), 'Total Quality Management' (TQM), 'Good Manufacturing Practices' (GMP), 'Good Hygienic Practices' (GHP), CODEX, 'Food Business Order' (FBO), 'AGMARK' etc. to prepare them to face the global competition in international trade.

- B. At present many outdated laws like Food Adulteration Act, Essential Commodity Act, APMC Act are found to exist which affect the dynamic progress of food processing sector in a negative way. These ineffective laws should be abolished or amended immediately. Moreover, there is a need to bring parity among various laws. Very recently there has been a proposal by the state government to amend the APMC act. The Union government also implemented the Food Safety and Standards Act, 2006 w.e.f. August 5, 2011. Proper implementation of the act and strict monitoring of quality provisions under this act will pave the way for further development of fruit and vegetable processing sector in the state.
- C. The burden of various taxes like value added tax, mandi tax, packaging tax, octroi to the food processing units is found to be rather high. This calls for a further tax reform to provide dynamic incentives to the producers by reducing the total tax burden to its minimum in the range of 0 to 10 per cent. In most of the countries where food processing is a success story, the tax burden is very low.
- D. Government's rethinking is needed now on land ceiling and acquisition law. It creates another institutional impediment as it does not allow the company to acquire land above ceiling limit and take up its own crop production. Thus, irregular and uneven supplies of raw material have always adversely affected the industry. To ensure a regular supply, the raw material production units should be treated as a plantation crop industry.
- E. The food processing industry is shrouded in a variety of laws spanning from the setting up of the factory to quality control of the final product. There are currently more than 20 laws and approval from 12 ministries are necessary that govern the food processing industry making the launch of a new product difficult and time consuming. It is not just the number of laws but their natures also create difficulties. Such difficult and time consuming proposition must be reduced to a more accessible one through adopting a single window approach by the government.
- F. The government should come forward to invest on infrastructural facilities like refrigerated vans, assembling centre, grading and packaging houses and post harvest treatment plants etc., in joint and co-operative sectors.
- G. Government's participation is highly needed to provide financial assistance through bank for creating cold storage facilities in the state.
- H. Proper training facilities in order to groom the farmers as well as processors of fruit and vegetable items about advanced production and processing techniques is required at a large scale in the state. In this connection it may be suggested that mobile skill development and training centres should be organized to impart the required technical knowledge and expertise to the farmers' and food processors. Very recently such mobile training centres have been successfully experimented in the neighboring state of Jharkhand for defusing farm technology among the farmers' free of cost.
- I. In order to provide a safety net to the workers, the agro-processing industry should be declared as 'Seasonal Industry' for the purpose of a more objective labour act.
- J. Deregulation of 'Pickles' and 'Chutney' from the small scale industry seems to be highly important to minimize inefficiency out of sheltering.
- K. Branding of products needs to be promoted in the state, as the branded products fetch higher prices in comparison to unbranded items.
- L. The state government should promote research and development for processing sector. Research and development in the line of introduction of new items in processed food sector in compliance to the changing tests and preferences of the people, maintenance of international quality standards

for processed items are of an urgent need in the state. Further, establishment of training centre for processing activities, at least one in each block in the district, technical course on food processing under various educational institutions would help food processing in West Bengal.

- M. For reducing excessive margins, a high degree of competition may be promoted through retail marketing. The Indian retail market is growing very fast. At present the Indian retail market is dominated by unorganized sector. Only 3 per cent of the total sale is done by the organized sector. The entry of organized sectors in retail business is bringing new technologies and more investment in marketing. It is also creating new job opportunities, but it may also displace the existing self-employed people. Fears are also being expressed that, by virtue of their size and power, multinational companies (MNCs) and large agri-business firms may space out small traders, processors and retailers. Thus, there is a need to examine the possible impact of entry of multinationals on the existing retailers.
- N. At present there is lack of price support to the fruit and vegetable growers. Thus to create the needed incentives, a price support scheme in the lines of 'Minimum Support Price' (MSP) may be introduced for fruit and vegetables.

Our study establishes it clearly that fruit and vegetable processing sector in West Bengal has performed well during the last two decades though there exists huge unexploited potentials in this sector. As regards the unexploited potentials of the fruit and vegetable processing sector in West Bengal, the major problems lie with poor infrastructure, primitive production and processing technologies, poor quality control, and lack of farm-firm linkages. Hence, the urgent need is that the government should invest more on developing hardcore infrastructure in view of the fact that the private sector is not likely to come forward to invest for infrastructural development. In that the priority areas appear to be road, power, transport, and cold chain system. It may be mentioned in this context that West Bengal agriculture is dominated by small and marginal producers and this scenario, given the agrarian structure, will continue to remain the same. Thus it is highly important that our

research and development system must provide an efficient alternative to small producers for improving their product quality, income and employment opportunity. In this context efficient institutional arrangements for promoting farm-firm linkages and enforcing stringent food laws seem to constitute the need of the time.

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