Assessment of Government-Assisted Fruit Processing Enterprises in Nueva Vizcaya*

Judith B. Leid¹ and Cristina R. Salvosa²

* Best Undergraduate Thesis Award (Non-Technical Category), 2008
1 Bachelor of Science in Agribusiness, major in Management, 2008
2 Department of Agribusiness Management, College of Agriculture, NVSU

Abstract

This study assessed the effects of government intervention to sales, profit, and market share of fruit processing enterprises in Nueva Vizcaya.

Majority of the respondents strongly agreed that government interventions such as skills development and capacity building, product development, and financial assistance equipped and transformed them into an efficient and productive business unit. This resulted in 17% increase on the average sales, a 23% increase in profit despite the moderate increase in sales, and an increase of PhP 625,401.4 for total assets and capital from 2004-2006. There was a fluctuating trend for market share, which could be explained by the stiff competition in the industry. Educational attainment of fruit processors significantly affected sales, profit and market share. Government intervention was significantly associated with production process, nutritional analysis and acquisition of fruit processing equipment.

Keywords:
fruit processing
production
sales
profit

INTRODUCTION

The rolling terrains of Nueva Vizcaya is favorable for growing high value crops. Farmers sell their produce fresh while others venture into processing their produce into food products.

Food processing is a set of methods and techniques used to transform raw materials into food products for consumption (Dagoon, 1993). Surplus materials are processed to improve their keeping quality.

Twenty business enterprises on fruit processing have been established in the province. This has been the major source of income of the processors-owners and their respective employees.

Improvements in processing, marketing, and packaging techniques have led to the production of various fruit preserves and candies including peanut brittle as well as dried mangoes and pineapple. They are very much sought in other regions including Manila (CASCADE and DTI, 2003). The big market potential prompted government agencies like DOST, DTI, PAO, and PCAO to launch many programs to assist the local fruit processors. These are in the form of trainings and seminars, product development, financial assistance, and market development which aim to help the fruit processors improve their products and increase employment in the province of Nueva Vizcaya.

Generally, this study assessed the effects of government interventions to fruit processors and their enterprises in the province of Nueva Vizcaya.

Specifically, it aimed to: 1) describe the socio-demographic characteristics of government-assisted fruit processors in Nueva
Vizcaya; 2) profile the government-assisted fruit processing enterprises in Nueva Vizcaya; 3) analyze government interventions and their effects to fruit processors and their enterprises in terms of skills development and capacity building, product development, marketability of the product, and financial viability; and 4) provide policy recommendations and directions to improve the fruit processing industry in Nueva Vizcaya.

**MATERIALS AND METHODS**

**Respondents and data collection**

All government-assisted fruit processors in Nueva Vizcaya were the respondents and primary data were gathered through personal interviews using semi-structured questionnaires. Secondary data were taken from books, magazines, journals, and unpublished theses. Officials of other government agencies involved in fruit processing were also personally interviewed to obtain and validate data.

**Data processing and statistical tools**

The study used descriptive analysis. The demographic profile of the fruit processors, their business enterprise profiles, and problems encountered were analyzed using frequency distribution and percentages. The sales and net profit were analyzed using three-year financial statements, while the market share of each respondent was analyzed using the following ratios:

For the assessment of the government

**Operational Framework of the Study**

<table>
<thead>
<tr>
<th>INPUT</th>
<th>INTERVENTIONS</th>
<th>OUTPUT</th>
</tr>
</thead>
</table>
| A. Processors Profile | Skills Development and Capacity Building | • Increase in sales  
• Increase in profit  
• Increase in market share |
| • Sex  
• Age  
• Household size  
• Educational attainment  
• Civil Status  
• Occupation  
• Number of years in business | Training/seminars on: | |
| | • Production process  
• Good manufacturing practices (GMP)  
• Hazard analysis and critical control point (HACCP) | |
| B. Business Enterprise Profile | Product Development | |
| • Production aspect  
• Marketing aspect  
• Financial aspect | • Nutritional analysis  
• Improvement of packaging and labels  
• Acquisition of food processing equipment | |
| | Financial Support | |
| | • Government grant-in-aid  
• Technology assistance loan | |

Figure 1. Operational framework in assessing government assisted fruit processing enterprises in Nueva Vizcaya.
interventions, Likert Scale was used. For the correlation of interval data, Pearson product-moment coefficient of correlation was used.

RESULTS AND DISCUSSION

Socio-demographic characteristics

Majority of the respondents were female (77.8 %), married (100 %), and under household bracket 1 – 5 persons (55.6 %). All of them were between ages 40 and 60 at the time of the study. Most of them finished their tertiary education (88.9 %) and were working full time in their business (88.9 %).

Business enterprise profile

Most of the respondents spent one to five years in their business and were under sole proprietorship categorized as cottage size (Php 150,000 – 1.5 M). Majority of the respondents hired one to five laborers under permanent status. Most of them gave a salary range of Php 1,000 – Php 2,000/month for permanent laborers and Php 80 – Php 100/day for hired laborers. This showed that the rate received by both permanent and hired laborers were below minimum wage rates in the province which is Php 193 per day as mandated by the labor code.

Production study

Respondents claimed to process almost all kinds of fruits grown in Nueva Vizcaya such as banana (14.3 %), citrus (5.7 %), papaya (5.7 %), pineapple (14.3 %), mango (8.6 %), rattan/litucco (14.3 %), santol (14.3 %), and tamarind (8.6 %). Some also processed bignay, coconut, guava, and kamias. These are sourced from growers, retailers and wholesalers.

Jams, jellies, pickles, and banana chips are the major products they process followed by tamarind balls, dried mangoes and pineapple, and fruit vinegars. Some of the respondents also processed dried kamias, buko pie, buko tart, fruit juices, prunes, puree, and wine.

Packaging materials used included bottles/jars (33.3 %), plastic (27.7 %), polyethylene canisters (22.2 %), foil, box and stand-up pouch (5.5 %). Product labels were bought (53 %), produced (33.3 %), and provided as grants (13 %).

Products were sold in and outside the province on cash (33.3 %) and through consignment (11 %).

Respondents practice mark-up pricing (66.7 %), cost-plus-method (22 %), and competitor’s influence (11 %). Products were either picked by buyers/customers (53.3 %) or delivered (46.7 %).

Majority of the respondents (88.9 %) advertised their products through personal selling (44.4 %), trade fairs (27.8 %), radio advertisements especially during special holidays (16 %), and by using billboards and streamers (22.2 %).

Financial study

Respondents had initial capital less than Php 10,000 (44.4 %), Php 100,001-Php 150,000 (22 %), and Php 10,001 Php 50,000 (11 %) sourced from savings (53.8 %) and grants (46 %). This result denotes that fruit processing business does not require high initial capitalization. From these, majority of the respondents (66.7 %) had a present capitalization of more than Php 200,001.

Problems encountered

Aside from inadequacy of financial resources, among the encountered problems included lack of raw materials during
off-season. Others suffered on high cost of ingredients, packaging materials, and processing equipment.

Marketing problems included inadequate number of sales personnel, competition, and limited market outlets.

Assessment of government interventions

Skills development and capacity building. Skills development and capacity building includes training and seminars on production process, good manufacturing practices (GMP), and hazard analysis and critical control point (HACCP).

Trainings on production process include new methods in fruit processing to upgrade the manufacturing process. Results showed that majority of the respondents strongly agreed that trainings on production process increased their sales and profit as well as market share. This result implies that efficient production process helps processors utilize efficiently their resources, hence, maximizing profit.

Good manufacturing practices (GMP) require that all manufacturing practices and testing equipment have been qualified suitable for use and that all operational procedures have been validated. Majority of the respondents strongly agreed that GMP increased their sales, profit and market share, which reflects that the more equipped a personnel is, the greater the return.

HACCP identify potential food safety hazards so that key actions known as Critical Control Points (CCPs) can be taken into consideration to reduce or eliminate hazard risks. Most of the respondents (55.6 %) strongly agreed that HACCP increased their sales, profit and market share. This signifies that HACCP is advantageous on the part of the processors because of the certainty that the product is safe for human consumption. Eleven percent (11 %) of them somewhat agreed while thirty three percent (33.3 %) of them did not yet undergo HACCP.

Product development. Product development includes nutritional analysis, improvement of packaging and label, and acquisition of fruit processing equipment.

Results revealed that very few of the respondents (22.2 %) strongly agreed that nutritional analysis increased their sales, profit, and market share. Eleven percent (11.1 %) of them somewhat agreed. This denotes that only a few of the fruit processors received assistance on the nutritional analysis of the product from the government as a form of intervention.

Suitable packaging and label design adds aesthetic attributes and makes the product more attractive to prospective customers. Majority of the respondents (55.6 %) strongly agreed that the improvement in their packaging and label increased their sales, profit, and market share. This reflects that better packaging and label contributed to the increase in sales, profit, and market share.

Inefficient production due to inappropriate equipment may result to low product quality and high cost of production. Forty-four percent (44.4 %) of the respondents strongly agreed that the government intervention in the procurement of fruit processing equipment increased their volume of production that eventually maximized their sales, profit and market share.

Table 1 is the summary of government assistance to fruit processors. The table reveals that DOST and DTI provided more assistance to the respondents.

Financial assistance. Financial assistance includes government grant-in-aid and technology assistance loan. The government institutions that gave grant-in-aid were DOST, DOLE-R2, DTI, PAO, TESDA, the Office of the Governor and the Office of the Mayor of Sta. Fe. They were granted assistance in 2000 – 2007 in the form of cash, equipment, and label designing and procurement.

Majority of the respondents strongly agreed that the grant-in-aid helped increase
Table 1. Interventions and the sponsoring agencies.

<table>
<thead>
<tr>
<th>Intervention/Assistance</th>
<th>DOST</th>
<th>DTI</th>
<th>PAO</th>
<th>PCAO</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production Process</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>-</td>
</tr>
<tr>
<td>GMP</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
<td>TESDA</td>
</tr>
<tr>
<td>HACCP</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>TESDA</td>
</tr>
<tr>
<td>Nutritional Analysis</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>UMFI</td>
</tr>
<tr>
<td>Improvement of Packaging &amp; label</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>CASCADE</td>
</tr>
<tr>
<td>Acquisition of Fruit Processing Equipment</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>no</td>
<td>DAR</td>
</tr>
</tbody>
</table>

Table 2. Comparative income statement.

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average sales (Php)</td>
<td>222,155.00</td>
<td>263,567.50</td>
<td>266,443.50</td>
</tr>
<tr>
<td>Average cost of goods sold &amp; operating expenses (Php)</td>
<td>158,817.55</td>
<td>186,729.20</td>
<td>124,132.83</td>
</tr>
<tr>
<td>Average net income (Php)</td>
<td>65,337.45</td>
<td>76,838.30</td>
<td>84,724.70</td>
</tr>
</tbody>
</table>

their sales (77.8 %), profit (66.7 %), and market share (55.6 %). This shows that the government grant-in-aid helped the processors in terms of capital build-up.

Almost eighty nine percent (88.9 %) of the respondents did not avail of the technology assistance loan.

Financial performance of government assisted fruit processors

Comparative income statement

Average sales were Php 222,155.00, Php 263,567.50 and Php 266,443.50 for the years 2004, 2005, and 2006 respectively. On the other hand, average cost of goods sold and operating expenses was Php 158,817.55, Php 186,729.20 and Php 124,132.83 for the years 2004, 2005 and 2006 respectively (Table 2). If this expense were deducted to the average sales, a net income of Php 65,337.45, Php 76,838.30 and Php 84,724.70 were realized for the years 2004, 2005 and 2006 respectively. This is an indirect effect of government interventions to the fruit processors. This also shows that even if there was only moderate increase in the sales of respondents for the last three years, fruit processing was still a profitable venture.

Comparative balance sheet

The average current assets for the last three years of operation were Php 105,261.90, Php 222,713.30 and Php 285,024.25 for 2004 to 2006 respectively. The average total assets increased from Php 463,838.40 in 2004 to Php 625,401.40 in 2006. This shows that
even if there was only moderate increase in sales for the past three years, the total average assets of the respondents increased.

**Comparative analysis of sales, profit, and market share**

There was an increasing trend in sales and profit of the respondents. This shows that the government interventions helped the fruit processors improve their business. The slight decrease in market share of the respondents during the period 2004-2005 was due to the stiff competition in the industry. The increased in market share in 2006 showed that the fruit processors can expand their market despite the stiff competition in the industry.

**Correlation analysis**

*Educational attainment and economic measure*

The p-value (0.020) of sales, profit and market share which was less than the set level of significance (0.05) and the correlation coefficient (0.750) indicates that educational attainment is positively correlated with sales, profit, and market share. This reflects that the level of education of the respondents is important to increase sales, profit, and market share.

Other demographic characteristics such as sex, age, household size, civil status, other occupation and number of years in business were not significantly correlated with sales, profit, and market share.

*Educational attainment and government interventions*

Production process and nutritional analysis are important to improve the quality of the product. Processing equipment is also important for efficient production. The correlation coefficient (0.750) and p-value (0.020) which was lower than the set level of significance (0.05) indicates that the level of education is significantly associated with production process, nutritional analysis and acquisition of fruit processing equipment. This implies that the higher the level of education, the greater the chance to adapt/understand the new production process and nutritional analysis. Sex, age, household size, civil status, other occupation and the number of years in business were not significantly associated with production process, nutritional analysis, and acquisition of fruit processing equipment.

**CONCLUSION AND RECOMMENDATIONS**

**Conclusion**

Government interventions contributed to skills development and capacity building of fruit processors enabling them to comply with product and processing standards. Interventions on nutritional analysis and suitable packaging and label improved aesthetic values of products for competitive advantage.

Government financial grants-in-aid and technology assistance loan resulted in the improvement of the fruit processors financial performance as indicated by increase in sales, profit, total assets, and capital. All grantees strongly agreed that acquisition of equipment
increased the volume of manufactured goods.

A positive correlation exists between level of education and the increase in sales, profit, and market share. Educational attainment is also positively associated with participation to trainings and seminars to improve their production process, nutritional analysis and acquisition of fruit processing equipment.

Recommendations

For fruit processors:

1. Agricultural products are highly seasonal and vulnerable to spoilage. To avoid high cost of raw materials during off-season, manufacture adequate volume of processed products to avoid stock-out. This equalizes the supply and demand of both raw and processed products.
2. Proper packaging and labeling attract the attention of prospective buyers. The product should be packed in an attractive form and should cater to the needs of the buyers. For example, fruit vinegars are usually packed in jars/bottles, but for budget pack and easy transport, stand-up pouch is advisable.
3. The salaries of production workers should be based on minimum wage. Additional incentives should be given based on the productivity of laborers to motivate them to work.
4. The business enterprises should assign sales personnel on marketing who will focus on the promotion of the product or to access new market outlets. This could be done on commission basis.
5. Fruit processors should have their products accredited by the Bureau of Food and Drugs (BFAD).

For government and non-government agencies:

1. More trainings and seminars on skills development and capacity building and product development should be done to equip the fruit processors and their production workers with good manufacturing practices to where their management and food quality control
2. Further improvement on the technology, packaging and labeling, and quality of product should be implemented to enable the processors to stay competitive in the market.
3. Enhanced efforts for market expansion should be done to help fruit processors sell their products especially outside the province. Conduct of trade fairs and exhibits are found to be effective in the introduction stage of the products. However, market linkages to potential outlets should be strengthened to sustain the fruit processing industry in the province. The One-Town, One-Product (OTOP) project of the government could spearhead this networking activity.
4. Further research on product development should be made to make the product competitive.

LITERATURE CITED

Nueva Vizcaya Product Catalogue. 2003. Published by CASCADE and DTI, Nueva Vizcaya.