## BIBLIOGRAPHY

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## ABSTRACT

The study was conducted to assess the DOST SET UP assisted food processing projects in Benguet and Baguio City. The respondents of the study were eight entrepreneurs who have graduated/ completed the SET UP intervention.

The study determined the profile of food processing enterprises assisted by SET UP in Benguet and Baguio City; status of the food processing enterprises in terms of production, marketing, financial and organization and management before the SET UP intervention; type of intervention adopted from the SET UP program; and effects or changes in terms of production, marketing, financial and organization and management as a result of the SET UP intervention.

Most of the entrepreneurs involved in food processing that were assisted by SET UP in Benguet and Baguio City were females. All of them received high level of formal education.

The respondents availed an amount of less than Php 100,000.00 and as much as Php 999, 000.00 from the SET UP assistance as the cash value of the equipment. Overall, the respondents were satisfied on availing Science & Technology interventions.

There was increased volume of production with automatically operated food processing methods and functional equipment availed from DOST. There was also an increased outlet established and production volume sold to these outlets after the intervention. Some of the respondents still could not cope up with the FDA standards on packaging and labeling of products. All of the respondents claimed that there was an increased financial operation and condition after availing the intervention. Half of the respondents had decreased total number of employees and all of them had improved their management capability after the intervention.

# INTRODUCTION

## Rationale

Food manufacturing - including food and beverage processing - remains the Philippines' most dominant primary industry accounting for 40.1 percent of total output in manufacturing. The industry represents a gross added value of more than $2.0 billion and grew by 3.2 percent in 2007. The Philippine Bureau of Food and Drugs' Statistical Report of Establishments for 2004 lists a total number of 11,601 food processing establishments nationwide. Most of the companies are owned by a single proprietor that is common among micro, cottage and small industries (Quianzon, 2008).

In support to this, Department of Science and Technology (DOST) launched the Small Enterprise Technology Upgrading Program (SET UP) in 2002 as a nationwide strategy to encourage and assist MSMEs to adopt technological innovations to improve their operations and thus boost their productivity and competitiveness. It enables firms to address their technical problems through technology transfer and technological interventions to improve productivity through better product quality, human resource development, cost minimization and waste management and other operation related activities (DOST, 2011).

Science and technology has become the most important factor for the national economic growth and source of competitive advantage (DOST, 2011). It is importantly needed by MSMEs to continuously improve the quality of their products and the productivity of their operations to insure competitiveness.

Roeber (1973), emphasized that changes in our social environment have come upon us so abundantly and rapidly that there is no ignoring their effects inside the organization. The rising of import demand and composition of preferred food products changed. These changes in the food basket of Filipino families can be attributed to the growing urbanization of the country (Ravago and Cruz, 2004). Ganguli (2011), stated that there is an increasing demand for processed and convenience food. However, the supply side has failed to keep up with the demand. The imparity between the current demand and supply offers immense scope for the manufacturers, retailers and suppliers of processed food.

Some of the factors that limit food processors in the provinces are the fabrication of small-scale processing equipment and efficient use of technology (DTI Research, 1999 as cited by Tibao, 2003). The preservation and storage of foods were important factor involved in the civilization of man and improvements in the technology of food preservation played no small part in the spread of civilization (Destroster, 1998).

As of June 2012, there are 42projects that were assisted by the DOST SET UP in Benguet and Baguio City. The most assisted project covered was the food processing which are about 22 enterprises. Most of them were completed while the others are either graduated, on- going or terminated (DOST, 2012).

People simply cannot live without food, and the need for a continuous food supply has led to the development of food processing industry that feeds the world (Murano, 2003).

Statement of the Problem

According to Picpican (2005), food processing is one of the off-farm activities of the people in the rural areas. It converts agricultural produce to value added products making it a major contribution to the generation of income and employment. Moreover, it is an important means to decrease food losses by preserving excess agricultural produce, improve food quality and variety and makes processed food available throughout the year.

Thus, SET UP program sees to it that the assistance provided could help the enterprise not only technically but also in all the functional areas of the business.

In support to this, the study intends to answer the following questions.

1. What is the profile of food processing enterprises assisted by SET UP in Benguet and Baguio City?

2. What is the status of the food processing enterprises in terms of production, marketing, financial and organization and management before the SET UP intervention?

3. What is the type of intervention adopted by the food processing enterprise from the SET UP program?

4. What are the effects or changes of the food processing enterprises in terms of production, marketing, financial and organization and management as a result of the SET UP intervention?

Objectives of the Study

In general, the study aims to assess the food processing projects assisted by the DOST SET UP in Benguet and Baguio City. Specifically, the study aims to:

1. Identify the profile of food processing enterprises assisted by SET UP in Benguet and Baguio City;

2. Determine the status of the food processing enterprises in terms of production, marketing, financial and organization and management before the SET UP intervention;

3. Determine the type of intervention adopted by the food processing enterprises from the SET UP program; and,

4. Identify the effects or changes of the food processing enterprises in terms of production, marketing, financial and organization and management as a result of the SET UP intervention.

Importance of the Study

Food processing is one of the leading forms of industrial activity in the country and undoubtedly the largest industry in the world (Greig, 1984). Being the most assisted projects by the DOST in the region, it is really a great privilege to the researcher to gain knowledge through the data acquired from the study. Basically, the result of the study could be fully utilized by the SET UP. It could be used by the program planners and technical evaluators in selecting beneficiaries and as their basis in decision making. Moreover, the information provided from this study can contribute to other entrepreneurs who are searching for assistance provided by DOST. Finally, the information could be utilized by other researchers who are specializing in the same field.

Scope and Limitations of the Study

This study was focused on the eight (8) food processing projects in Benguet and Baguio City which was assisted by DOST SET UP. It perceived to answer the profile of food processing enterprises, the status of the food processing enterprises in terms of production, marketing, financial and organization and management before the SET UP intervention, the type of intervention adopted from the SET UP program and the effects or changes of the food processing enterprises in terms of production, marketing, financial and organization and management as a result of the SET UP intervention.

The study was conducted on February, 2013.

# REVIEW OF LITERATURE

## Micro, Small, and Medium Enterprises (MSMEs) Definition

As defined under the Small and Medium Enterprise Development (SMED) Council Resolution No. 01 Series of 2003 dated 16 January 2003, micro, small, and medium enterprises (MSMEs) are any business activity/enterprise engaged in industry, agribusiness/services, whether single proprietorship, cooperative, partnership, or corporation whose total assets, inclusive of those arising from loans but exclusive of the land on which the particular business entity's office, plant and equipment are situated, must have value falling under the following categories: by asset size- Micro: up to Php 3,000,000; Small: Php 3,000,001-P15,000,000; Medium: Php 15,000,001-Php 100,000,000; Large: above Php 100,000,000 and based on the number of employees- Micro: 1-9 employees; Small: 10-99 employees; Medium: 100-199 employees; Large: 200 employees and above (DTI, 2008).

## DOST SET UP

Small Enterprises Technology Upgrading Program (SET UP) is a DOST flagship project that complements Pres. Gloria Macapagal-Arroyo call for a more focused and integrated program of assistance to micro, small and medium enterprises (MSMEs). It is a technology intervention package designed to assist and increase the productivity and competitiveness of MSMEs (DOST, 2011).

SET UP program covers the following sectors: (1) food processing, (2) furniture, (3) gifts, toys, house wares, handicrafts, natural fibers and dyes, (4) marine and aquatic

resources, (5) horticulture (cut flowers, fruits and high value crops), (6) metals and engineering, (7) information and communication technology/electronics, and (8) health products and services/pharmaceuticals(DOST, 2011).

SET UP hopes to assist MSMEs improve their productivity and competiveness through the: (1) infusion of new/advanced technologies to improve operations of MSMEs, (2) provision of limited funds for technology acquisition, (3) manpower training, technical assistance and consultancy services, (4) design of functional packages and labels, (5) assistance in the establishment of product standards including testing, (6) database information system (DOST, 2011).

Application for SET UP Intervention

A proponent shall submit a project proposal following the SET UP prescribed format and attachments. Viable project proposals for SET UP assistance or requests for any changes of on-going SET UP projects must be evaluated by the DOST regional evaluators before these are submitted to SET UP at the DOST Central Office which will also refer to another set of evaluators from concerned DOST Research and Development Institutes/Councils. A proposal is approved when all the comments and/or suggestions of all the evaluators are clarified and/or complied. When approved, a memorandum of agreement (MOA) between the cooperator and DOST SET UP is signed before the implementation starts. The SET UP assistance on equipment upgrading, laboratory testing, and product packaging improvement require refunds for an average period of three years (i.e. monthly or quarterly). No surcharges or penalty charges are imposed provided that the approved refund remittance period is followed with a six- month grace period after the

release of fund. After the full refund, the DOST SET UP issues transfer of certificate of equipment ownership to the cooperator (Picpican, 2010).

Impact of SET UP To MSME's Gross Sales

According to the report of DOST-10 Regional Director Angelito Alolod, businesses that received support under the Department of Science and Technology- Small Enterprises Technology Upgrading Program in Region 10 have generated more than P100M in gross sales from 2002 to September 2005. DOST-Technology Application and Promotion Institute has released P1.6M to implement the Manufacturing Productivity Extension Program for the Export Industry (MPEX) that benefited 35 firms, which claimed a 20-30% increase in productivity level as a result of recommendations of industry experts hired through MPEX. The Science and Technology Expert Volunteers Pool Program, and Consultancy in Agricultural Productivity Enhancement also provided consultants to these MSMEs to adopt technology interventions that include facilities upgrade, packaging, and labeling (Baluyos, 2008).

Food Processing: Definition and Importance

Food processing is the conversion of raw materials or ingredients into a consumer food product. A more complete definition is found in Connor (1988),where "commercial food processing" is defined as that branch of manufacturing that starts with raw animal, vegetable, or marine materials and transforms them into intermediate foodstuffs or edible products through the application of labor, machinery, energy, and scientific knowledge (Heldman and Hartel, 1997).

World hunger is a serious problem with no simple solution. Each year, people die from hunger or problems caused by hunger. A change in the makeup of the population, lifestyles, incomes, and attitudes on food safety, health, and convenience is also an issue facing producers and marketers of food products. To respond to this problem, there are many organizations who are involved in food processing. The major technological support comes from food scientists, technicians, and other industry employees who use their training and experience to convert raw foods into quality products quickly, efficiently, and with a minimum of waste. They also process raw materials maintaining the flavor, color, texture, nutritional value and its safety (Parker, 2003).

Evolution of Food Processing Industry

Some of the earliest forms of food processing resulted in dry products. They are using the thermal energy from the sun to evaporate water from the product and establish a stable and safe dry product. The first reference using heated air to achieved food drying occurred in France around 1795.Napoleon Bonaparte offered a prize to scientist to develop preserved foods for the armies of France. This offer leads to Nicholas Appert and the commercial sterilization of foods. In 1842, a patent for use of commercial refrigeration process for fish was registered. In the 1860s, Louis Pasteur, working with beer and wine, developed the process of pasteurization. The use of refrigeration to reduce the temperature of food below the point of ice crystallization was developed by Birdseye in the 1920s. Overtime, it has become evident that extended shelf life is not possible without a modification to some of the products attributes (Heldman and Hartel, 1997).

Philippine Food Processing Industry

The Philippines' food processing sector is the most dominant manufacturing sector in the country. It accounts for 40% of total manufacturing output, contributes 20% of GDP per annum and is growing at 8%-10% per annum. The sector comprises of fruits and vegetables, meat and poultry, flour and bakery, dairy products, fish and marine, beverages, confectioneries, food condiments and seasonings, food supplements, bottled water, snack foods, fats and oils. This sector is heavily reliant on both domestically produced and imported agri-food products (DPI, 2008).

According to the study of Picpican (2005), the enterprises in the region are generally family- owned and locally based. They are utilized and labor- intensive food processing technologies. Almost all have remained as micro enterprises with less than ten workers, a great majority of whom work on part time basis depending on the seasonal availability of major raw materials. The major raw materials used are grouped as cereals, fruits, meat, root crops and vegetables. The processed food products are grouped as cereals and bakery products, processed fruits, fermented products, processed meat products, processed root crops, processed vegetables, and other food products such as *gipah* tea, ginger tea and coffee. Almost half of them have their processed food products tested by government testing laboratories either at the DOST or Bureau of Food and Drugs (BFAD).

Challenges of Food Processing Industry

Local food processors are faced with numerous challenges in order to maintain market share - or when introducing a new product - now that a wide variety of imported processed foods readily enter the market due to increased trade liberalization. The industry

contributes approximately 20 percent of GDP per annum. Domestic processors continue to face numerous challenges, including one of the highest energy costs in Asia; the need for improvements and innovations in technology and packaging in order to become more globally competitive; insufficient post-harvest and storage facilities; and inadequate farm-to-market transportation infrastructure. There has been considerable improvement, particularly for the bigger companies whose financial capabilities are able to support expensive capital outlays. Some companies have qualified and are ISO certified. However, there are still a significant percentage of SME processors, especially in provincial areas (Quianzon, 2008).

Similarly, Tibao (2003) emphasized that some of the limiting factors that may influence the efficiency of operation may include lack of knowledge, lack of competent technologists or lack of skills and knowledge to do necessary job, lack of equipment and other aids in the effective use of time.

Small firms need to concern themselves with their market position, their technological trajectories and competence- building and organizational processes. Given lack systematic research which is not particularly innovative, they must necessary cope with changing technology that impacts their business, as information technology (IT) does today (Tidd *et al.,* 2005).

The establishment and successful operation of small- and medium-scale food processing and packaging enterprises faces a number of significant constraints such as insufficient supply of good quality raw materials, a low level of technology, quality assurance challenges, and competitive markets in the new era of globalization, and lack of credit and finance (APO, 2012).

Comparing Philippines with U.S., the Philippines have an insufficient cold chain system and a less developed infrastructure, i.e., storage, roads and shipping facilities. The food industry in the Philippines is also generally risk averse when it comes to trying new product ideas while American products were once the predominant import on supermarket shelves, food processing facilities, and restaurant menus, competition in the market has greatly intensified over time. U.S. products are also priced higher compared to local products and other imported products, and consumers are highly price sensitive. Package sizes tend to be smaller for the purpose of affordability. Fierce competition has also led some food-processing plants to invest in technology that result in less waste and higher productivity. Factory automation is being applied to various functions, including inventory control, product movement, packaging, and inspection (CDOSH, 2010).

Davis (2008), further stated that producers are faced with finding ways to meet ever-changing consumer desires, while at the same time controlling costs and maintaining high quality and safety standards. The greatest challenge currently facing the industry is the increase in energy prices. Higher energy costs have impacted the food processing industry both coming and going. Increasing cost pressures on the food processing industry may also lead companies to make location decisions that increase efficiency by utilizing existing relationships, supply and distribution chains, and infrastructure. Producers must also address growing consumer concerns about food safety. According to the Food Marketing Institute, consumer confidence in the food supply dropped to 66 percent in 2007, down from 82 percent in 2006. Contamination, product tampering and terrorist threats were considered the top areas of concern.

Technology

According to Tibao (2003), it refers to the machines or equipment, process, techniques and methods applied during production to eliminate manual operation and practically to increase productivity and product quality.

Producer would choose a technology that would give him higher net return provided he can afford to supply the input and other requirements of the technology and bear the risk associated there from (PCARRD, 1991).

Contribution of technology to Food Processing Industry

Since the mid- 1990s, the acceleration of successful businesses in U.S improves over existing performance and contributes 21 percent of the output of companies, and the average employee is six times more productive than the others because of the presence of technology specifically Information System (IS) technology (Ettlie, 2006).

The ASEAN food Technology Research and Development Project under the ASEAN food Science and Technology revealed that with the improved processes and technologies increase efficiency in the use of raw material and energy, and efficiency in management, thus reducing cost of production. Quality of products is also improved, benefiting the consumer and enabling the producer to find wider markets. Improved handling and introduction of new technology were able to upgrade the quality of traditional products. In Thailand, technology for extracting juice from pineapple, guava and star fruit, which have low juice content, was improved, resulting to higher yields. Technology transfer is the ultimate aim of the research projects to improve or develop new products and processes to give benefit to industry and the national economies through increased

employment, and exports. In Malaysia a Yong Tao Foo Stuffing machine and fish smoking technology have been transferred, while in the Philippines technology for dehydration and processing of various fruits and fish, as well as fish smoking was transferred to producers through seminars. In Indonesia pilot plants were set up for tempe inoculum and formulated foods (Philhakpol *et al*., 1990).

International Rice Research Institute (IRRI), along with the International Maize and Wheat Improvement Center (CIMMYT), International Livestock Research Institute (ILRI), the International Food Policy Research Institute (IFPRI), and some 200 local partners are establishing new business models for scalable, self-sustained delivery of new information and technologies. New rice technologies, such as agronomic, postharvest, and processing innovations, have a strong demand in Southeast and East Asia. IRRI, along with its partners, supports the delivery of technologies and principles that will help develop Africa's rice value chain by establishing rice knowledge centers that simulate farmer-to-farmer learning and participatory learning of rice principles and technologies and their out-scaling; developing learning tools, such as training modules, radio scripts, video, and other tools in local languages (IRRI, 2011).

Food Processing: Opportunities

Many opportunities are waiting nationwide due to the increase in the need of high quality processed foods and to meet the demand of the increasing population. There are a lot of job vacancies, technical experts, food scientist and workers that are posted not only in offices but through the internet.

A study done by Agriculture and Agri-Food Canada (AAFC) within the last three years has ranked the Philippines as one of the largest markets for retail processed/packaged foods in the ASEAN region 1. Hypermarkets and supermarkets, whose presence is continuously growing, have catered to the changes in the local market's behavior towards retail and processed foods. The expanding below-30 population or single households, and working couples (i.e. mostly professionals) are also potential markets, given their demand for meal solutions, and imported food products. A major factor in urbanization, this has set a trend on dining out which encouraged investors to franchise local and foreign fast food outlets and restaurant chains, establish full service restaurants, gourmet restaurants (most of which sell imported products), cafés, bars, home delivery or takeaway, food kiosks (AAFC, 2010).

Conceptual Framework

The ultimate goal of the study is to assess the food processing projects assisted by DOST SET UP in Benguet and Baguio City. It perceives to determine the profile of the entrepreneur including the food processing activities and objectives in availing the intervention, the status of the business in terms of production, marketing, financial, and organization and management before availing SET UP assistance. More practical and applicable questions will be asked to elicit factual data and information about the operation and management of the enterprise being assessed. The study will also determine the intervention adopted by the entrepreneurs from the SET UP program as well as the problems encountered in availing SET UP interventions. The changes or improvement in the operation of its production, marketing, financial, and organization and management

aspect will be assessed after adopting the SET UP intervention. Recommendations will follow after the completion and tabulation of the necessary data to be gathered.

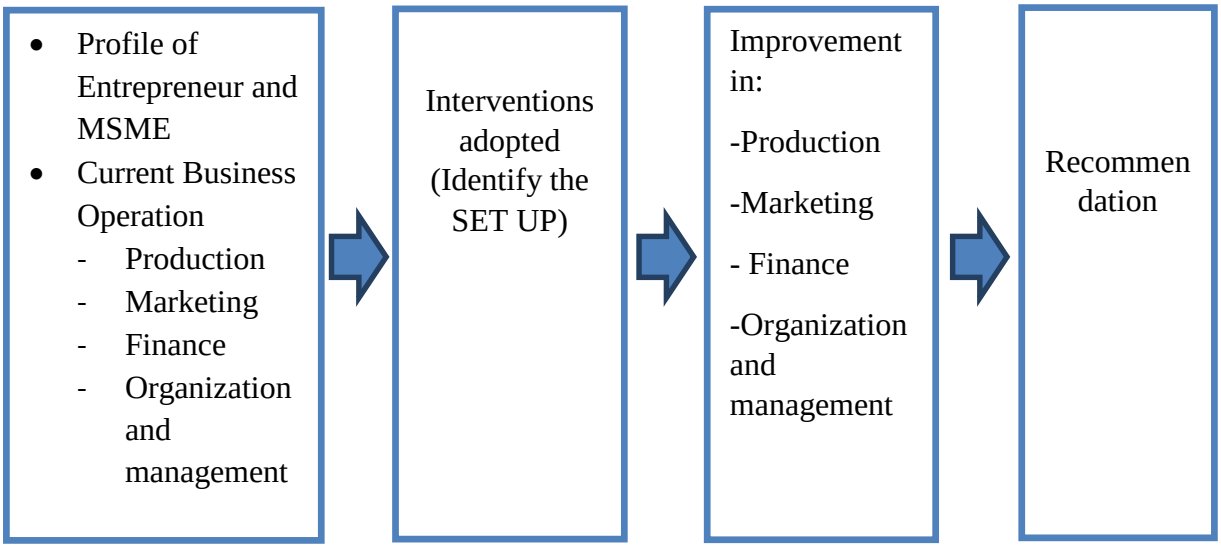


Figure 1. Conceptual framework of the study

Definition of Terms

Technology transfer.is when an entrepreneur is willing to give up his/her current production facilities or process to adopt a new technology.

Technology intervention.is the involvement or adoption of technology to influence the operation of the business.

Innovation.is the development of new process or product.

Food processing.the transformation of raw ingredients into food, or of food into other forms.

TNA. (Technology Needs Assessment) is a strategy used by the DOST to identify the MSME's technology needs and goals in their operation.

GDP.Gross Domestic Product is the market value of all officially recognized final goods and services produced within a country in a given period of time.

Pasteurization.is a process of heating a food to a specific temperature and thenimmediately cooling it after it is removed from the heat to slow down spoilage.

# METHODOLOGY

## Locale of the Study

The study was conducted in different municipalities of Benguet and Baguio City. The study was conducted on February, 2013.

## Respondent of the Study

Based on the records of DOST as of June 2012, there are eight (8) food processing projects assisted by SET UP in Benguet and seven (7) in Baguio City which were already graduated and completed. Graduated projects mean that the equipment were already acquired and repayment was completed while in completed projects, the equipment acquisition was completed but with on-going repayment. These are the targeted respondents of the study however, due to limited resources of the researcher and unwillingness of some respondents to be interviewed or fill-up the questionnaires, only eight (8) sample respondents cooperated.

## Research Instrument

A questionnaire was constructed based from the Technology Needs Assessment Manual and other research data disclosed. It was used as a guide in surveying respondents. It was composed of the following parts; profile of the entrepreneur, enterprise profile, SET UP interventions availed, status of the business before and after the SET UP intervention.

Method of Data Collection

The study used the combination of primary and secondary data gathering. The primary data was conducted through interview and filling-up the questionnaire which was given to the respondents. Follow-up and clarifications on some data was done through personal and cell phone communications. Secondary data was gathered from the DOST records to verify and obtain some relevant information about the project with the permission of the respondents.

Data Gathered

This study covers eight food processing projects in Benguet and Baguio City which were assisted by DOST SET UP. It includes the profile of food processing enterprises, the status of the food processing enterprises in terms of production, marketing, financial and organization and management before the SET UP intervention, the type of intervention adopted from the SET UP program and the effects or changes of the food processing enterprises in terms of production, marketing, financial and organization and management as a result of the SET UP intervention.

Data Analysis

The data gathered from the respondents will be tabulated, analyzed and interpreted using statistical analysis such as frequency counts and percentage.

## RESULTS AND DISCUSSION

This section presents the findings of the study. The first part presents the profile of the entrepreneur, profile of the enterprise, intervention adopted from the SET UP program, production status, marketing status, financial status and organizational and management status of the enterprises before and after the SET UP intervention.

Profile of the Entrepreneur

Table 1 presents the profile of the entrepreneurs which includes their age, gender, civil status and educational attainment.

Age. Fifty percent (50%) of the respondents have ages ranging from 46 to 60 years old, followed by 31 to 45 years old ( 37.5%) and the least was the 61 to 75 years of age(12.5%).

Gender. Majority (62.5%) of the respondents were females while the others were males (37.5%). This implies that females are more active in engaging into food processing as compared to the males.

Civil status. All (100%) of the respondents were married. They revealed that they were assisted by their family in managing the enterprise.

Educational attainment. Seventy five percent of the respondents were college graduates, 12.5% reached college level and another 12.5% were vocational graduates. According to them as an owner- manager of their own enterprise, formal education was an important factor for proper management on the resources of the enterprise.

Table 1. Profile of the entrepreneur

| CHARACTERISTIC | FREQUENCY | PERCENTAGE |
|---|---|---|
| Age | | |
| 31- 45 | 3 | 37.5 |
| 46-60 | 4 | 50.0 |
| 61- 75 | 1 | 12.5 |
| TOTAL | 8 | 100.0 |
| Gender | | |
| Male | 3 | 37.5 |
| Female | 5 | 62.5 |
| TOTAL | 8 | 100.0 |
| Educational attainment | | |
| Vocational graduate | 1 | 12.5 |
| College level | 1 | 12.5 |
| College graduate | 6 | 75.0 |
| TOTAL | 8 | 100.0 |

Profile of the Enterprise

Table 2 presents the form of business organization, number of years in operation, year of establishment, and year of registration.

Form of business organization. All (100%) of the respondents were sole proprietors which mean that the enterprise was established through their own initiatives.

Number of years in operation. Out of the eight (8) respondents, 37.5% had been in the business for 16 to 20 years while few (25%) for 11 to 15 years and 25% for five years

and below. This indicates that most of the respondents' business existed for many years but were on and off in their operation before due to limited capital and unexpected events such as increase and seasonal availability of raw materials, natural calamities affecting their operation and news that affected their production.

Year of establishment. Fifty percent (50%) of the respondents established their business before 2000 while the rest have established their business from 2005 to 2009. The result implies that some enterprises already existed for more than ten years and some were newly established.

Year of registration. One of the requirement in availing the SET UP program is to submit a copy of the Local Government Unit (LGU) and Department of Trade and Inductry (DTI) Permits. The respondents revealed that majority (75%) of the respondents registered their business during the year 2006-2009. One of the 8 respondents registered in 2010 to 2012. This indicates that some respondents did not immediately register their business upon their establishment.

Table 2. Number of years in operation, year of establishment and year of registration

| PARTICULARS | FREQUENCY | PERCENTAGE |
|---|---|---|
| No. of years in operation | | |
| 5 years and below | 2 | 25.0 |
| 6- 10 years | 1 | 12.5 |
| No. of years in operation | | |
| 11- 15 years | 2 | 25.0 |
| 16- 20 years | 3 | 37.5 |
| TOTAL | 8 | 100.0 |

Table 2. Continued…

| PARTICULARS | FREQUENCY | PERCENTAGE |
|---|---|---|
| Year of establishment | | |
| Before 2000 | 4 | 50.0 |
| 2000-2009 | 4 | 50.0 |
| TOTAL | 8 | 100.0 |
| Year of registration | | |
| 2002- 2005 | 1 | 12.5 |
| 2006- 2009 | 6 | 75.0 |
| 2010- 2012 | 1 | 12.5 |
| TOTAL | 8 | 100.0 |

SET UP Intervention

Tables 3 to 8 present the SET UP Intervention in terms of year of intervention, amount of SET UP assistance availed, sources of information, S&T interventions availed, objectives in availing SET UP assistance, attainment of the objectives, problems and contraints encountered and level of satisfaction from the assistance.

Year adopted the SET UP assistance. Table 3 presents that 50% of the respondents availed the SET UP assistance from year 2010 to 2012, 37.5% availed in 2006 to 2009 and 12.5% availed in 2002 to 2005. Results implied that the entrepreneurs availed the assistance in different years. Perhaps some have observed the effect of the assistance in other business before they availed.

Amount of SET UP assistance availed. Table 3 shows the cash value of the equipment availed by the respondents from SET UP intervention. Fifty percent (50%) of

the respondents availed an amount of Php 100,000 to Php 299, 000 worth of assistance from the SET UP program. Twenty five percent availed less than Php 100,000 while 12.5% each had Php 300,000 to Php 599,000 and Php 600 000 to Php 999 000. The result shows that the respondents availed different amounts of assistance from DOST. This is because the amount of assistance depends on the type and value of the equipment availed.

Table 3. Year started adopting the SET UP intervention/s and amount of SET UP assistance availed

| PARTICULARS | F | % |
|---|---|---|
| Year started adopting the SET UP intervention | | |
| 2002-2005 | 1 | 12.5 |
| 2006-2009 | 3 | 37.5 |
| 2010-2012 | 4 | 50.0 |
| TOTAL | 8 | 100.0 |
| Amount of SET UP assistance availed | | |
| Below 100, 000. 00 | 2 | 25.0 |
| 100, 000-299, 000. 00 | 4 | 50.0 |
| 300, 000- 599, 000. 00 | 1 | 12.5 |
| 600, 000- 999, 000. 00 | 1 | 12.5 |
| TOTAL | 8 | 100.0 |

Sources of information. Table 4 present the sources of information of the respondents about the SET UP program. The respondents revealed that they acquired the

information from their co-entrepreneurs (50%) and from some agency personnel (50%). One (12.5%) claimed that it was advertised from the radio. This shows that the respondents were resourceful about the programs launched by the DOST- CAR that could provide assistance to their enterprise.

SET UP interventions availed. Table 5 presents the SET UP interventions availed by the respondents. The table shows that all (100%) of them availed the Technology Needs Assessment (TNA) done by the DOST technical staff. This was the first step in the SET UP requirements. The DOST staff analyze and assess the needs of the enterprise in all aspects of the business. Majority (62.5%) of the respondents availed project proposal preparation, the same number of respondents availed equipment upgrading and manpower training about current good manufacturing practices while 50% of them availed for packaging and labeling. Several respondents (37.5%) availed provision of equipment for the process and for the laboratory testing and analysis such as beta carotene content and nutritional analysis. Post harvest and marketing assistance were the

Table 4. Sources of information about SET UP program

| SOURCES OF INFORMATION | FREQUENCY | PERCENTAGE |
|---|---|---|
| Radio | 1 | 12.5 |
| Co-entrepreneur | 4 | 50.0 |
| Agency personnel | 4 | 50.0 |

*Multiple response

Table 5. S&T interventions availed from SET UP program

| S&T INTERVENTIONS AVAILED | FREQUENCY | PERCENTAGE |
|---|---|---|

| | | |
|---|---|---|
| Technology Needs Assessment | 8 | 100.0 |
| Project proposal preparation | 5 | 62.5 |
| Provision of production technology | | |
| Process | 3 | 37.5 |
| Equipment upgrading | 5 | 62.5 |
| Quality Control/Laboratory Testing/Analysis | 3 | 37.5 |
| Packaging and Labeling | 4 | 50.0 |
| Post- Harvest | 1 | 12.5 |
| Manpower Training | 5 | 62.5 |
| Marketing assistance | 1 | 12.5 |

*Multiple response

least availed by the respondents with 1 each. Result shows that the interventions availed by the respondents vary depending on the needs of their enterprise.

Objectives in availing SET UP. Table 6 shows that most (87.5%) of the respondents objectives in availing SET UP were to upgrade production facilities and process. Fifty percent (50%) of the respondents targeted to increase production volume to meet the market demand while 37.5% each aimed to generate employment and create additional market outlet. Few of the respondents aimed to improve product quality (25%) and expand the product line (25%).

Table 6. Objectives in availing SET UP

| OBJECTIVES IN AVAILING SET UP | FREQUENCY | PERCENTAGE |
|---|---|---|
| To upgrade production facilities/process | 7 | 87.5 |
| To improve product quality | 2 | 25.0 |
| To expand the product line | 2 | 25.0 |
| To increase production volume meeting the market demand | 4 | 50.0 |
| To generate employment | 3 | 37.5 |
| To create additional market outlet | 3 | 37.5 |

*Multiple response

The result implies that upgrading production facilities and process were highly needed by the respondents. Some did not avail the other interventions because it was not applicable to their enterprise.

Attainment of objectives. Seven of the eight respondents attained their objectives. One respondent was not able to attain his objective because the production area was completely destroyed by typhoon "Pepeng" in 2009. For the respondents who attained their objectives, 37.5% of them attained 80% to 90% which mean that they nearly attained all their objectives given the equipment availed, 25% attained 1 to 50% since the equipment availed did not meet the projected volume of production increase,12.5% attained their objectives 100% because the production volume has doubly increased and the other 12.5% attained only 60% to 70% of their objectives. This implies that the SET UP program contributed in the attainment of the objectives of the different entrepreneurs.

Table 7. Attainment of objectives

| PARTICULARS | FREQUENCY | PERCENTAGE |
|---|---|---|
| Attainment of objectives | | |
| Attained | 7 | 87.5 |
| Percentage of attainment | | |
| 100% | 1 | 12.5 |
| 80- 90% | 3 | 37.5 |
| 60-70% | 1 | 12.5 |
| 1- 50% | 2 | 25.0 |
| Unattained | 1 | 12.5 |
| Reason for unattainable objectives | | |
| Production area was destroyed by typhoon | 1 | 12.5 |

Problems/constraints encountered. Table 8 shows that there were five (62.5%) who said that they encountered problems/constraints in adopting the SET UP program while the 37.5% did not encounter any problem. Three of them had problem in meeting the planned repayment schedule due to many unpredictable factors that affected them like: natural calamities, increase in price and seasonality of raw materials. Despite these difficulties the respondents still need to remit repayments regardless of these reasons because it is where SET UP program evaluated the enterprise on the attitude and timely repayment. Compliance with the documentary requirements is another problem encountered by one respondent. These respondents said that he has no time for processing the requirements of the program. One of the respondents met problem on the slow turn-over of equipment availed. On the other hand 37.5% did not met any problem because

Table 8. Problems/constraints encountered in adopting the SET UP intervention

| PROBLEMS/CONSTRAINTS | FREQUENCY | PERCENTAGE |
|---|---|---|
| Encountered problems | 5 | 62.5 |
| Compliance with the repayment schedule | 3 | 60.0 |
| Compliance of documentary requirements | 1 | 20.0 |
| Slow turn-over of the equipment availed | 1 | 20.0 |
| TOTAL | 5 | 100.0 |
| No problem encountered | 3 | 37.5 |
| Reasons for no problem met | | |
| Have knowledge already in preparing the requirements | 2 | 66.7 |
| Have skills in the technology operation | 1 | 33.3 |
| TOTAL | 3 | 100.0 |

*Multiple response they already knew how to prepare the necessary documents as pointed by two respondents while one of them said that he already have skill in the technology operation.

Level of satisfaction from the SET UP intervention availed. Table 9 shows the level of satisfaction of the respondents from the SET UP intervention availed. Based on the weighted average, fifty percent (50%) of the respondents were very satisfied on the equipment upgrading, quality control/laboratory testing/analysis, packaging and labeling

and manpower training on current good manufacturing practices (CGMP) while 50% were satisfied on the technology needs assessment, project proposal preparation, on the acquired equipment for the process and marketing assistance availed. This shows that all of the interventions availed by the respondents have positive impact to the enterprises.

Type/ category of food processing commodities. Table 10 shows that the eight enterprises produce various processed food products as follows: cereal and bakery products such as cakes, bread, cookies, mallows, *pinipig* and oats; processed root crops like peanut butter, peanut brittle and carrot noodle: dairy products such as fresh milk that processed by their cooperative for yogurt, *pastillas* and butter; oyster mushroom products such as mushroom patties, fresh mushroom and mother planting spawns and lastly colonies which are the source of honey.

There were half (50%) of the respondents processing root crops and 37.5% were producing cereals and bakery products. Others were producing dairy products (12.5%), bee keeping (apiary) products (12.5%) and oyster mushroom products (12.5%). Two of the respondents were producing cereals/ bakery products and root crops at the same time. This implies that the respondents do not only engaged in one product but can be of two commodities.

Table 10. Type/ category of food processing commodities

| PRODUCTS PROCESSED | FREQUENCY | PERCENTAGE |
|---|---|---|
| 1. Cereals and Bakery Products | | |
| Bread, cakes, cookies | 2 | 25.0 |
| Mallows, *pinipig*, oats | 1 | 12.5 |

Table 10. Continued …

| PRODUCTS PROCESSED | FREQUENCY | PERCENTAGE |
|---|---|---|
| 2. Processed Root Crops | | |
| Carrot noodle | 1 | 12.0 |
| 3. Dairy Products | 1 | 12.5 |
| 4. Bee keeping (Apiary) Products | 1 | 12.5 |
| 5. Oyster Mushroom Products | 1 | 12.5 |

*Multiple response

Production Volume/day Before and After the Intervention

Table 11 present the volume of production per day by the respondents before and after the SET UP intervention. As shown in the table, five (62.5%) out of the eight respondents increased production volume after acquiring additional equipment. Two of them were able to double their production volume after availing the equipment and three increased their production by 50%. One of the three respondents said that the equipment availed was not efficient enough, at least, there is no need to go to a grinding shop to grind the product. Two (25%) of them still maintained the same volume of production but use lesser energy and time in their production process. One respondent stopped production after the intervention since the production area was destroyed by typhoon Pepeng. The finding therefore revealed that the SET UP intervention enabled the respondents to increase their production or maintain the same volume but used less energy and time.

Table 11. Production volume/ day before and after the SET UP intervention

| RESPONDENTS | BEFORE | AFTER | INC. /(DEC.) | % CHANGE |
|---|---|---|---|---|
| 1 | 205 pcs. | 299 pcs. | 94 | 45.85 |
| 2 | 600 pcs. | 1, 200 pcs. | 600 | 100.00 |
| 3 | 3, 900 pcs. | 5, 850 pcs. | 1, 950 | 50.00 |
| 4 | 85 pcs. | 85 pcs. | 0 | 0.00 |
| 5 | 350 pcs. | 583 pcs. | 233 | 66.57 |
| 6 | 20 pcs. | 40 pcs. | 20 | 100.00 |
| 7 | 25 lit. | 25 lit. | 0 | 0.00 |
| 8 | 500 pcs. | 0 | 0 | 0.00 |

Food processing methods. Table 12 presents the processing methods of the respondents before and after the intervention and how they are done; whether manual or automatic.

Manually operated means that the activity/process was done by hand while automatically done means that the activity/process was done by a machine or equipment.

The dough mixing/grinding method from the cereals and bakery products shifted automatically. In the case of the root crop processor, before the intervention she used to bring her peanut for grinding in Baguio City but after the intervention she is now using her own grinder. For the processed noodle, the processor shifted from manual weighing/batching and mixing to automatic weighing/batching and mixing. The mixing method of the oyster mushroom patties and the extraction method from the dairy products shifted from manual to automated mixing and extraction. This implies that the intervention had a positive impact to their processing methods of the entrepreneurs.

Table 12. Food processing methods followed before and after the intervention

| FOOD PROCESSING METHODS FOLLOWED | BEFORE | | AFTER | |
|---|---|---|---|---|
| | Manual | Automated | Manual | Automated |
| 1. Cereals and Bakery Products | | | | |
| Mixing/grinding | 2 | | 1 | 1 |
| Dough kneading | 1 | 1 | 1 | 1 |
| Cutting | 2 | | 2 | |
| Cooking | 2 | | 2 | |
| Cooling | 2 | | 2 | |
| Packaging | 2 | | 2 | |
| 2. Processed Root Crops | | | | |
| Weighing of ingredients | 1 | | 1 | |
| Roasting of peanuts | | 1 | | 1 |
| Removal of seed coats | 0 | | 0 | |
| Grinding/Mixing | | 1 | | 1 |
| Packaging | 2 | | 2 | |
| 3. Processed Noodle | | | | |
| Weighing/batching | 1 | | | 1 |
| Mixing | 1 | | | 1 |
| Dipping in cold water | 1 | | 1 | |
| Dipping in boiling water | 1 | | 1 | |
| Rinsing in cold water | 1 | | 1 | |
| Frying | 1 | | 1 | |
| Drying | 1 | | 1 | |
| Packaging | 1 | | 1 | |
| 4. Oyster Mushroom Patties | | | | |
| Harvesting | 1 | | 1 | |
| Washing | 1 | | 1 | |
| Bunching | 1 | | 1 | |
| Mixing | 1 | | | 1 |
| Semi-cooking | 1 | | 1 | |
| Cooling | 1 | | 1 | |
| Packing | 1 | | 1 | |
| Freezing | 1 | | 1 | |
| 5. Dairy Products (fresh milk) | | | | |
| Prepare the cow | 1 | | 1 | |
| Clean the equipment | 1 | | 1 | |
| Extraction | 1 | | | 1 |
| Pasteurization | 1 | | 1 | |

Food Processing Equipment Before and After the Intervention

Table 13 shows the equipments owned and availed by the respondents from the SET UP program. Before the intervention, a total of forty seven (47) equipments were owned by the respondents and after the intervention the number of equipments increased to seventy five. This means that there were 28 equipments acquired through the SET UP program. One respondent acquired 9 pieces of new equipments through the program which is equal to 112.5% increase. Another respondent acquired 4 equipments which is 80% increase in total equipment holdings. Three respondents were able to purchase three additional equipments each while another three respondents were able to purchase two additional equipments.

Table 13. Food processing equipment before and after the intervention

| RESPONDENTS | BEFORE | AFTER | INC. /(DEC.) | % CHANGE |
|---|---|---|---|---|
| 1 | 5 | 9 | 4 | 80.00 |
| 2 | 7 | 10 | 3 | 42.86 |
| 3 | 8 | 17 | 9 | 112.50 |
| 4 | 10 | 12 | 2 | 20.00 |
| 5 | 2 | 5 | 3 | 150.00 |
| 6 | 8 | 11 | 3 | 37.50 |
| 7 | 1 | 3 | 2 | 37.50 |
| 8 | 6 | 8 | 2 | 33.33 |

Functionality of equipments. Table 14 presents the functionality of equipments used before and after the intervention. Functional equipment means that it is still usable while not functional means that item is not being used by the enterprise because it was already damaged or replaced by newly acquired equipment.

Comparing from Table 13, as the equipment increases, the number of not functional equipment also increased. One of the 8 respondents was not using all his equipments after the intervention because they were destroyed by typhoon Pepeng. Three respondents mentioned that after the intervention all their equipments were still being utilized. Two respondents said that after the intervention 2 each of their equipments are no longer utilized because they replaced them with the new ones. One respondent had 5 nonfunctional equipment before the intervention and still have 5 nonfunctional equipments after the intervention but has a total of 7 equipments after the intervention which means that there were two new equipments purchased through the program.

Table 14. Functionality of equipment before and after the intervention

| RESPONDENTS | BEFORE | | AFTER | |
|---|---|---|---|---|
| | Functional | Not functional | Functional | Not functional |
| 1 | 5 | 0 | 9 | 0 |
| 2 | 7 | 0 | 8 | 2 |
| 3 | 8 | 0 | 15 | 2 |
| 4 | 5 | 5 | 7 | 5 |
| 5 | 2 | 0 | 4 | 1 |
| 6 | 8 | 0 | 11 | 0 |
| 7 | 1 | 0 | 3 | 0 |
| 8 | 6 | 0 | 0 | 8 |

Effect of the equipment to production. When it comes to the effect of the equipment to production, all (100%) of the respondents claimed they had an increase in their production as shown in Table 15. Before the intervention their production was minimal due to their inefficient equipments and manual methods used. After the intervention, majority (62.5%) claimed that they have increased production from the equipment availed. However, 25% still have minimal production after acquiring the equipment but have faster production process, lesser energy and time consumed.

Marketing Status Before and After the Intervention

This presents the market outlets supplied and established, volume of products supplied, promotional media used, packaging materials used, packaging standards followed, labeling content of the product and product quality requirements availed before and after the SET UP intervention.

Table 15. Effect of the equipment to production before and after the intervention

| EFFECT TO PRODUCTION | BEFORE | | AFTER | |
|---|---|---|---|---|
| | F | % | F | % |
| Increase Production | 0 | 0 | 5 | 62.5 |
| Minimal Production | 8 | 100 | 2 | 25.0 |
| Decrease Production | 0 | 0 | 1 | 12.5 |
| TOTAL | 8 | 100 | 8 | 100.0 |

Market outlets supplied. Table 16 shows that fifty percent (50%) increased their market outlet supplied while some of the respondents maintained supplying the same number of market outlets. Respondent 8 has no market outlet supplied after the intervention since there were no more processed products to be supplied to these market outlets.

Market outlets established. Table 17 presents the market outlet established by the respondents before and after the intervention. Fifty percent (50%) of the respondents increased their market outlets established because they supply more products with the help of the equipment availed from SET UP. Thirty five percent have only maintained their outlet because of strong competition in the market. One respondent said that he does not yet established market outlet since he only took orders and have not regularly supply them while one did not establish his market outlet after the intervention because his business was destroyed by calamity. The result shows that there was increased in market outlet established as an effect of the intervention.

Table 16. Market outlets supplied before and after the SET UP intervention.

| RESPONDENTS | BEFORE | AFTER | INC /( DEC) | % CHANGE |
|---|---|---|---|---|
| 1 | 18 | 24 | 6 | 33.33 |
| 2 | 3 | 3 | 0 | 0.00 |
| 3 | 74 | 78 | 4 | 5.33 |
| 4 | 6 | 9 | 3 | 50.00 |
| 5 | 10 | 18 | 8 | 80.00 |
| 6 | 1 | 1 | 0 | 0.00 |
| 7 | 3 | 3 | 0 | 0.00 |
| 8 | 12 | 0 | 0 | 0.00 |

Table 17. Market outlets established before and after the SET UP intervention.

| RESPONDENTS | BEFORE | AFTER | INC / DEC | % CHANGE |
|---|---|---|---|---|
| 1 | 18 | 24 | 6 | 33.33 |
| 2 | 3 | 3 | 0 | 0.00 |
| 3 | 74 | 78 | 4 | 5.33 |
| 4 | 6 | 9 | 3 | 50.00 |
| 5 | 10 | 18 | 8 | 80.00 |
| 6 | 1 | 1 | 0 | 0.00 |
| 7 | 0 | 0 | - | 0.00 |
| 8 | 12 | 0 | 0 | 0.00 |

Volume of products supplied to outlets. Table 18 emphasized that the respondents are continuously supplying their market outlets as much as their production volume per day. About 63% of the respondents increased the volume of products supplied to their market outlets after availing SET UP assistance, 25% still have maintained the same volume of production while one has zero production after the intervention not because of the equipment availed but due to the typhoon which destroyed his production area. Comparing with table 16, as the market outlets increases, the volume of products sold also increased.

Promotional media used. Table 19 shows that all (100%) of the respondents promoted their products through person to person contact. Some of the respondents could not afford advertisement through radio or newspaper because their businesses were micro-enterprise. Some claimed that their target markets were only their neighbors and that they already knew their product. After SET UP assistance, 50% of the respondents participated during trade fairs like the "Adivay festival", strawberry festival and the

Table 18. Volume of food products supplied to the outlets before and after the SET UP intervention.

| RESPONDENTS | BEFORE | AFTER | INC / DEC. | %CHANGE |
|---|---|---|---|---|
| 1 | 205 pcs. | 299 pcs. | 94 | 45.85 |
| 2 | 600 pcs. | 1, 200 pcs. | 600 | 100.00 |
| 3 | 3, 900 pcs. | 5, 850 pcs. | 1, 950 | 50.00 |
| 4 | 85 pcs. | 85 pcs. | 0 | 0.00 |
| 5 | 350 pcs. | 583 pcs. | 233 | 66.57 |
| 6 | 20 pcs. | 40 pcs. | 20 | 100.00 |
| 7 | 25 lit. | 25 lit. | 0 | 0.00 |
| 8 | 500 pcs. | 0 | 0 | 0.00 |

Panagbenga. One respondent (12.5%) still maintains his promotional advertisement in the internet through face book. One respondent who used promote his product in the newspaper (Midland Courier) did not maintain after the intervention since there was no more products to promote after the production area was destroyed by typhoon. Although, one respondent availed for marketing assistance, DOST provide assistance to the other respondents in order for their products to be known.

Packaging materials used. Table 20 shows that there were no differences in the packaging materials used. However based on the two respondents interviewed, the packaging materials used after the intervention is much quality than the packaging materials used before. Say for the bottle, they changed from an ordinary bottle into ladies choice bottle. Another said that the plastic jars which were used before was easy to be contaminated not like the microwavable plastic jars that was introduced by the FDA.

Table 19. Promotional media used before and after the SET UP intervention

| PARTICULARS | BEFORE | | AFTER | |
|---|---|---|---|---|
| | F | % | F | % |
| Promotional media used | | | | |
| Person to Person | 8 | 100.0 | 8 | 100.0 |
| Trade fairs | 1 | 12.5 | 4 | 50.0 |
| Internet (face book) | 1 | 12.5 | 1 | 12.5 |
| Newspaper (Midland) | 1 | 12.5 | 0 | 0.0 |

*Multiple response

Packaging standards followed. Table 20 shows that before the intervention, all (100%) of the respondents followed their own standards but after availing the intervention, 50% of the respondents followed the FDA standard. They prefer following FDA standard in order to ensure the safety and contamination free of the products. Fifty percent (50%) still followed their own standard since it was not applicable to their enterprise. This indicates that some are still hard up in coping with the FDA standard on packaging after availing the intervention.

Labeling content of the products. As to the labeling content, majority (62.5%) of the respondents just labeled their products name while 25% put the weight, ingredients, product of the Philippines, and name and address of the manufacturer before the intervention (Table 21). After the intervention, 62.5% of the respondents have completely followed the labeling content required by FDA with the help of DOST. Some respondents never labeled their products such as the colonies and fresh milk. Some of the respondents

claimed that even if they availed the FDA standards, they still followed the preference of their customers.

Table 20. Packaging materials used and packaging standards followed before and after the SET UP Intervention.

| PARTICULARS | BEFORE | | AFTER | |
|---|---|---|---|---|
| | F | % | F | % |
| Type of packaging materials used | | | | |
| Cellophane | 3 | 37.5 | 3 | 37.5 |
| Wood | 1 | 12.5 | 1 | 12.5 |
| Plastic Jars | 2 | 25.0 | 2 | 25.0 |
| Bottle | 1 | 12.5 | 1 | 12.5 |
| Styrofoam | 1 | 12.5 | 1 | 12.5 |
| TOTAL | 8 | 100.0 | 8 | 100.0 |
| Packaging standards followed | | | | |
| Own standards | 8 | 100.0 | 4 | 50.0 |
| FDA standards | 0 | 0.0 | 4 | 50.0 |
| TOTAL | 8 | 100.0 | 8 | 100.0 |

Table 21. Labeling content of the products before and after the SET UP intervention

| LABELING CONTENT OF THE PRODUCTS | BEFORE | AFTER | INC/ DEC | % CHANGE |
|---|---|---|---|---|
| Products name | 5 | 6 | 1 | 20 |
| Weight | 2 | 5 | 3 | 150 |
| Ingredients | 2 | 5 | 3 | 150 |
| Product of the Philippines | 2 | 5 | 3 | 150 |
| Name and address of manufacturer | 2 | 5 | 3 | 150 |
| Expiry date | 1 | 5 | 4 | 400 |
| Nutritional facts | 1 | 5 | 4 | 400 |
| No. of pieces | 1 | 5 | 4 | 400 |

* Multiple response

Product quality requirements availed. Table 22 shows that 12.5% of the respondents have acquired shelf- life inspection, microbial analysis and size/wt. per piece before the SET UP intervention. After the SET UP intervention, majority (62.5%) of them availed microbial analysis while 12% availed the shelf-life requirements. This indicates that most of the respondents were concerned about the quality of the products they sold to their customers.

Table 22. Product quality requirements availed before and after the SET UP intervention

| PRODUCT QUALITY REQUIREMENTS | BEFORE | AFTER | INC/(DEC) | % CHANGE |
|---|---|---|---|---|
| Shelf life Inspection | 1 | 1 | 0 | 0 |
| Microbial analysis | 1 | 5 | 4 | 400 |
| Size/wt./ piece | 1 | 0 | - | - |

Financial Status Before and After the Intervention

Table 23 presents the financial operation and financial condition of the enterprises per year. The table shows that before the intervention, all of the 8 respondents indicated their financial status but only four answered after the intervention. However, all of the respondents claimed that there was an increase in their production operation and condition after the intervention.

For the financial operation, all of the respondents have net income that ranged from Php 8,000 to Php 1,000,000. After availing the equipment assistance, three from the four respondents who revealed their financial operation have increase net income while the other one was status quo. They said that with the quality of the availed equipment, they have increased their volume of production and that resulted to higher net income.

For the financial condition, the table presents that all of the respondents have a minimum of Php 40, 000 and as much as Php 9, 000, 000 asset and capital before the intervention. Six respondents have liabilities amounting to Php 3, 000 up to Php 50, 000 while two respondents don't have any liabilities. After availing the equipment, all

Table 23. Financial operation and condition of the enterprise before and after the SET UP Intervention

| RESPONDENTS | | BEFORE | AFTER | INC/(DEC) | % CHANGE |
|---|---|---|---|---|---|
| Financial Operation | | | | | |
| | 1 | 501, 583.42 | No response | - | - |
| | 2 | 673, 642.00 | 1, 010,463.00 | 336, 821 | 50 |
| | 3 | 1, 281, 122.05 | No response | - | - |
| | 4 | 8, 407.00 | No response | - | - |
| | 5 | 80, 776.00 | 145, 396.8 | 64, 620.8 | 80 |
| | 6 | 22, 000.00 | 39, 600.00 | 17, 600 | 80 |
| | 7 | 46, 506.00 | 46, 506.00 | 0 | 0 |
| | 8 | 60, 000.00 | - | - | - |
| Financial Condition | | | | | |
| 1 | Asset | 2, 192, 628.30 | 2,329, 628.30 | 137, 000 | 6.25 |
| | Liabilities | 22, 652.00 | 35, 000.00 | 12, 348 | 54.51 |
| | Capital | 2, 169, 976.30 | 2, 294, 628.30 | 124, 652 | 5.74 |
| 2 | Asset | 3, 717, 499.31 | 3, 800, 264.31 | 82, 765 | 2.23 |
| | Liabilities | 18, 765.00 | 0 | (18, 765.00) | (100.00) |
| | Capital | 3, 698, 734.31 | 4, 177, 499.31 | 478, 765 | 12.94 |
| 3 | Asset | 9, 375, 561.05 | No response | - | - |
| | Liabilities | 35, 868.85 | No response | - | - |
| | Capital | 9, 339, 692.20 | No response | - | - |
| 4 | Asset | 40, 941.00 | No response | - | - |
| | Liabilities | 2, 594.00 | No response | - | - |
| | Capital | 38, 347.00 | No response | - | - |

Table 23. Continued …

| RESPONDENTS | | BEFORE | AFTER | INC/(DEC) | % CHANGE |
|---|---|---|---|---|---|
| Financial Condition | | | | | |
| 5 | Asset | 43, 825 | 293, 825.00 | 250, 000 | 570 |
| | Liabilities | - | - | - | - |
| | Capital | 43, 825 | 293, 825.00 | 250, 000 | 570 |
| 6 | Asset | 980, 000 | No response | - | - |
| | Liabilities | - | No response | - | - |
| | Capital | 980, 000 | No response | - | - |
| 7 | Asset | 3, 450, 336 | 3, 518,336.00 | 68, 000 | 1.97 |
| | Liabilities | 24, 350 | - | (24, 350) | (100.00) |
| | Capital | 3, 425, 986 | 3, 518,336.00 | 68, 000 | 1.97 |
| 8 | Asset | 3, 650, 000 | No response | - | - |
| | Liabilities | 50, 000 | No response | - | - |
| | Capital | 3, 600,000 | No response | - | - |

respondents who answered have increased their asset and capital with a minimum of Php 17, 000 and as much as Php 336, 000. Three of them don't have any liabilities at all. The other respondent still has liabilities because his term of repayment from the equipment availed was not yet due. All of the respondents reasoned that due to the equipment availed, they have increased their assets and capital.

Total employment generated. Table 24 shows the total employment generated by the enterprise before and after the intervention. Fifty percent (50%) of the respondents claimed that their employees have decreased while several (37.5%) increased in the number of employees. Most of their employees before were family members but have their own work after. The reasons why most of the respondents have less employees after the

intervention are as follows; replacement of machines, no permanent laborers, seasonal production and lack of skills of the employees. Some of the respondents told that they hired more after the intervention for more production. At least few have backward employees such as the grinding shop and the suppliers of flour.

Table 24. Total employment generated by the enterprise before and after the SET UP intervention

| TOTAL EMPLOYMENT GENERATED | BEFORE | AFTER | INC/(DEC) | % CHANGE |
|---|---|---|---|---|
| 1 | 6 | 8 | 2 | 33.33 |
| 2 | 17 | 12 | (5) | (29.41) |
| 3 | 23 | 23 | 0 | 0.00 |
| 4 | 10 | 3 | (7) | (70.00) |
| 5 | 1 | 2 | 1 | 100.00 |
| 6 | 13 | 7 | (6) | (46.15) |
| 7 | 4 | 0 | (4) | (100.00) |
| 8 | 5 | 10 | 5 | 100.00 |

Management capability improvement. Table 25 shows that all (100%) of the respondents have improved their management capability after availing the SET UP intervention. As to reasons, if percent (50%) said that to have acquired skills in designing innovative products, 25% to have improved their organizational structure, and improved in the delegation of duties, respectively. Moreover, one respondent had fast production process while the other stated that there was improvement in product quality.

Table 25. Reasons for improvement in management capability after the SET UP intervention

| MANAGEMENT CAPABILITY IMPROVEMENT | F | % |
|---|---|---|
| Reasons for the improvement | | |
| Improved/ fixed organizational structure | 2 | 25.0 |
| Delegation of duties | 2 | 25.0 |
| Skills in designing innovative products | 4 | 50.0 |
| Fast production process | 1 | 12.5 |
| Improved quality of products | 1 | 12.5 |
| TOTAL | 8 | 100.0 |

## SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The findings of the study are the following:

This study was conducted to assess the DOST SET UP assisted food processing projects in Benguet and Baguio City. The respondents of the study were eight entrepreneurs who graduated/ completed the SET UP intervention.

The study determined the profile of food processing enterprises assisted by SET UP in Benguet and Baguio City; status of the food processing enterprises in terms of production, marketing, financial and organization and management before the SET UP intervention; type of intervention adopted by the food processing enterprises from the SET UP program; and effects or changes of the food processing enterprises in terms of production, marketing, financial and organization and management as a result of the SET UP intervention.

Most of the entrepreneurs involved in food processing that were assisted by SET UP in Benguet and Baguio City were females. They were married, belonged to sole proprietorship organization and received high level of formal education. Most of the respondents existed for many years but they were on and off in their operation. Fifty percent of the entrepreneurs registered their enterprise but not upon its establishment.

Most of the respondents only availed the SET UP intervention from year 2006 to 2012. The amount of assistance availed by the respondents ranged from less than Php 100,000 up to Php 999, 000 from the SET UP. These were in the form of equipments.

All of the respondents availed the technology needs assessment done by the DOST technical staff while more than half of the respondents availed project proposal preparation,

equipment upgrading and manpower training about current good manufacturing practices. Overall, the respondents were satisfied on SET UP interventions availed of. Also, majority of the respondents attained their objectives.

In the production of the enterprise before and after the intervention, there was an increase in the volume of product produced to some of the respondents while others maintained their volume of production but claim improved product quality and processes after availing the equipment. However, there were no diversifications in the product lines. There was increased in the automated food processing methods and functional equipment of the enterprise after availing the equipment.

For the marketing status, there was increased on the outlet established and increased in the production volume sold to these outlets after availing the SET UP intervention. Some of the respondents were hard up in coping with the FDA standards on packaging and labeling after availing the intervention. On product quality, most respondents availed microbial analysis and were concerned into the safety assurance of the customers.

On the financial status of the enterprises, all of the respondents claimed that there was increased in their financial condition and operation after availing the equipment.

As to the organization and management status, fifty percent of the respondents have decreased total number of employees after the intervention because of the following reasons; replacement of machines, no permanent laborers, seasonal production and lack of skills of the employee. All of the respondents also have improved their management capability after the intervention. Specifically, they have skills in designing innovative products, improved/ fixed organizational structure and delegation of duties, fast production process and improved quality of products.

Conclusions

Based on the findings, the following conclusions were made:

1. The food processing enterprises assisted by DOST SET UP in Benguet and Baguio City belong to sole proprietorship. All of them were educated and acts as owner-manager of their enterprise;

2. The interventions availed by the respondents from the SET UP vary depending on the needs of their enterprise. All of them were satisfied on the SET UP interventions availed;

3. Overall, SET UP program has a positive impact to food processing enterprises for the reason that it increases productivity, improved processing methods, product quality, increases market outlets, improved packaging and labeling, increased financial condition and operation and improved management capability of the entrepreneurs ; and

4. The common problems/ constraints encountered were the compliance to the repayment schedules and compliance to documentary requirements.

Recommendations

1. Most of the respondents heard the SET UP program through co- entrepreneurs and agency personnel. Thus, DOST must also conducts training and seminars close to rural areas in order for those who haven't any resources such as internet, friends and relatives from the government can avail from it;

2. Although there was increase in the market outlet established, there still need for expansion in order to cope up with the competition in the market. The DOST staff must assist them on marketing strategies to be done to market their products;

3. There should also be diversification of products and expansion of production areas in order to avoid losses and delay of operation due to seasonal availability of raw materials and destruction of natural calamities; and,

4. SET UP has positive effect on all the functional areas of the enterprise thus, they must continue motivating and encouraging more food processing enterprises to avail on this program.

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