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Adding Value to rural produce through Food Processing

Agriculture in India

Agriculture in India is one of the most prominent sectors in its economy. Agriculture and allied sectors like forestry, logging and fishing accounted for 18.6% of the GDP in 2005 and employed 60% of the country's population. About 43 % of India's geographical area is used for agricultural activity. Despite a steady decline of its share in the GDP, agriculture is still the largest economic sector and plays a significant role in the overall socio-economic development of India.

The monsoons play a critical role in the Indian sub-continent's agriculture in determining whether the harvest will be bountiful, average, or poor in any given year. The entire rainfall in the sub-continent is concentrated in the few monsoon months. A bad monsoon season is devastating to a country in which 60% of the population is depended on agricultural and especially for farmers whose only water source are the monsoon rains. India ranks second worldwide in farm output. Nevertheless, despite high growth, international comparisons reveal that the average yield in India is generally 30% to 50% of the highest average yield in the world. The low productivity in India is a result of the following factors:

- Illiteracy, general socio-economic backwardness, reforms and inadequate or inefficient finance and marketing services for farm produce.
- The average size of land holdings is very small (less than 20,000 m²) and are subject to fragmentation, due to land ceiling acts and in some cases, family disputes. Such small-holdings are often over-manned, resulting in disguised unemployment and low productivity of labor.
- Adoption of modern agricultural practices and use of technology is inadequate, hampered by ignorance of such practices, high costs and impracticality in the case of small land holdings.

- Irrigation facilities are inadequate, as revealed by the fact that only 53.6% of the land was irrigated in 2000–01, which result in farmers still being dependent on rainfall, specifically the monsoon season.

In addition to low productivity, a lack of cold storage facilities and knowledge of post-harvest technologies result in the waste of millions of tones of produce in India.

In the last few decades several farmers have committed suicide especially in the states of Andhra Pradesh, Maharashtra, Karnataka, and Kerala. Combating this has become a major challenge for these governments. Some of the causes for the deaths include indebtedness of small and marginal farmers and repeated crop failures.

Overview of Food Processing

Although India is the largest producer of fruits in the world, the production per capital is only about 100 gms per day. However, it is estimated that more than 20-22% of the total production of fruits is lost due to spoilage at various post harvest stages. Thus the per capita availability of fruits is further reduced to around 80 gms per day which is almost half the requirement for a balanced diet. Although the world's second largest producer of fruits & vegetables, India only processes 2% of her own produce. The food processing sector in India has great growth potential domestically and has export prospects. Food processing helps farmers manage their yields and get better returns since processed foods fetch comparatively higher rates than the raw produce itself. Food processing adds value, enhances shelf life and encourages crop diversification. Moreover, it is employment intensive and generates 1.8 direct employment per ten lakh rupee of investment and 6.4 employment indirectly. Food processing, coupled with marketing, has thus the potential of solving the major problems of agriculture surpluses, wastages, unemployment and uncertain prices to the farmers. The market for processed food - even within India - is a sleeping giant. Rapid urbanization, increased literacy, and rising per capita income has led to an exponential increase in demand for more processed foods. Additionally, rapid growth of food processing sector is inevitable since urbanisation with globalisation is changing life-style and food habits, rising prosperity is increasing demand for value added food products, more and more women joining work force need sheer convenience of processed food, and large export opportunities exist globally where price realization is much better. In any event, the food sector is a good investment as an average Indian spends about 50% of household expenditure on food items.

The fruit production in India has recorded a growth rate of 3.9%, whereas the fruit processing sector has grown at about 20% per annum. However, the growth rates have been extensively higher for frozen fruits & vegetables (121%) and dehydrated fruits & vegetables (24%). There exist over 4000 fruit processing units in India with an aggregate capacity of more than 12 lakh MT (less than 4% of total fruits produced). It is estimated that around 20% of the production of processed fruits is meant for exports, the rest caters to the defence, institutional sectors and household consumption, Mango and mango-based products constitute 50% of exports.

Manual harvesting is widely practiced for fruits due to abundant supply of surplus agricultural labour. The fresh fruits are mostly harvested by hand or hand tools, sorting and grading of fruits are done on a very limited scale and that too are based on visual inspection only. Limited precooling facilities are available for grapes, strawberries etc. only for export purpose. India's farmers suffer from an aversion to fruit growing as this requires high initial investment and long gestation period. Poor quality of seeds and other planting material available affect the yield of fruits and thereby returns to the farmers. For low educational level coupled with poor technical training/extension facilities available to the farmers, adoption of new technologies has always been a problem area. These result in non-uniform quality of fruits produced in India.

Future Trends

The expert opinion survey has inferred the following trends in the future for fruits and vegetables sector :

Fruits and vegetables would continue to be harvested manually in the future. While small land holdings and non-availability of good quality planting material have been the major issues of concern, it is expected that quality of planting material would improve in the long run due to selection, hybridisation, breeding and tissue culture.

For poor farm management practices, there exists strong need for extension education and training for the growers. Cooperative and contract farming may solve the problems for small land holdings towards improved yield and quality in the long run.

Application of fungicides/pesticides and chemical preservatives would be phased out and would be replaced by more environment friendly technologies in the long run.

While precooling (cold chain) and surface coating are expected to dominate in the short run, CA/MA packaging and irradiation technologies are expected to emerge in the long run for preservation and extension of shelf life.

While marketing of fruits and vegetables is expected to be dominated by cooperatives and middle men in short term, organised direct sourcing supermarkets are likely to emerge dehydrated products, fruit juices, pickles and other forms of preserves are likely to emerge as popular processed products, Change in consumer taste, food habits & life style, convenience, nutritional value and purchasing power are the likely reasons for preference of processed products.

While the level of processing would hover around 5-10% in the next 10 years, 15-20% of fruits and vegetables may be processed in the long term.

The share of sectorial consumption for processed fruits and vegetables in the long term would be as follows :

- ◆ Domestic-30%
- ◆ Institutions-40%
- ◆ Exports - 30%

Reduction of unacceptable level of wastages of the farm produce and providing remunerative prices to farmers are major problems for the Indian agriculture that carries about 2/3rd of the population. The problem is likely to aggravate if the planned doubling of agri-production is realized.

The Need for Processing in Jalihal area

From speaking to farmers in the Jalihal region, it quickly becomes apparent that a lack of access to water is the biggest problem that families face. This problem is universally cited by rich farmers, poor farmers, landless farmers, farmers with access to bore-wells and farmers that rely solely on monsoon rains. Despite this problem of a lack of access to water, horticulture crops are grown in abundance with major crops including grapes, pomegranate, carrots, cabbages, red chilies, limes, mangoes and onions to name a few. Despite the lack of access to water cited by all farmers and despite being situated in a drought prone area, horticulture crops are nevertheless grown in abundance and are therefore raw products to which we can add value to.

An interesting case-study about how we can add value to produce is by taking a closer look at the economics of lime farmers. Limes are grown in abundance in the Jalihal region because they need little water and they grow well in the local soil conditions. Limes are a unique crop in that they are harvested around the year and that they are sold in terms of number of limes rather than kilograms of limes. A unit of limes sold in the

Bijapur market is referred to as a “dag” and they are sold in batches of 1,100 limes per dag. During the summer season between February to May, the demand for limes is very high from juice vendors because of the hot temperatures, therefore the price of limes is very high at around 700-1,400 rps per dag. In the rainy and winter season, June – September and November – December, there is a huge supply of limes because of the monsoon rains and limited demand because of the wet and cold weather. The price of 1,100 limes during the rainy and winter seasons falls to between 10-200 rps. Because the cost of harvesting, transporting, and purchasing bags is higher than the price of limes in the market-place, farmers end up letting their limes fall on the ground and use the limes as fertilizer.

By adding value to and preserving limes during the rainy and winter seasons, farmers can increase their incomes and reduce the unnecessary wastage that is so prevalent in agriculture in India and Jalihal today.

The Project

Title: Adding Value to rural produce through Food Processing

Objectives: To realize the vast potential of agriculture in Jalihal by developing a food processing unit so as to:

1. Enhance farmers income
2. Generate employment opportunities
3. Reduce wastage of produce
4. Increase crop diversification
5. Contribute to Jalihal’s overall development
6. Provide profit to Yerala Projects Society to become self-sustainable
7. Curtail migration and improve living standards in Jalihal region

Activities:

We propose the development of a food-processing unit that will manufacture ketchup, juices, jams and pickles. The activities will take place in both Jalihal and Sangli. In Jalihal, cultivation, collection, grading and pre-processing of fruits will take place. In Sangli, final processing, packaging and marketing will take place. We strongly believe that assembling the final product in Sangli allows for a more commercially viable center for basing marketing efforts and allows for increase scrutiny in the quality of the product before being dispatched to markets. In terms of specific location, the Jalihal pre-

processing activities will take place in the community hall of the YPS campus and the processing and storage of final products will occur on YPS's Kupwad campus.

Activities in Jalihal:

As stated above, the following activities will take place in Jalihal:

1. Cultivation: women's self-help groups will be enlisted in the cultivation of fruit ingredients required for food processing unit. From a food-processing standpoint, this cultivation is intended to ensure the highest quality raw materials for the final product and a uniform varietal of produce for processing. Training on cultivation, providing seeds, providing access to water (as needed) and providing micronutrients will all be the responsibility of Yerala Projects Society. Following produce which will be used for processing is being produced in the farms of local farmers-

- Lemon (paper lime)
- Mangos
- Ginger
- Tomato
- Chilly
- Turmeric
- Spices
- Vegetables

The harvested produce will then be sold back to Yerala Projects Society at a pre-determined contracted rate. This cultivation of seeds will mostly be targeted to middle-income families who are currently cultivating only one other type of produce. This program will provide a steady income stream to women, diversify cropping patterns by moving away from a one-product agricultural venture and increase education on advanced techniques in crop cultivation.

Role of women's SHGs:

There are 10-12 self help groups in every village. These SHGs have been formed by YPS. These Self help groups will play an important role in food processing activity.

► Through the SHGs a strong backward linkage will be establish which will ensure quality and timely supply of raw material to the unit in required quantity. SHGs will select the women members who will participate in the cultivation program. The processing unit will provide their need of raw material according to the production program to the SHGs. The members will be asked to take particular crops in

particular area so that the required quantity could be produced. An agreement will be made with SHGs mentioning the services provided by the processing unit, price and the supply schedule. YPS will provide required inputs like seeds, fertilizers etc to the SHG members through SHGs. One hundred women members will be provided required credit every year. Entire produce by each member will be procured by the processing unit giving them fixed price. The credit provided for the cultivation purpose will be deducted from the cost of supplied item and remaining amount will be paid to the member.

► SHGs will also be involved in pre-processing of pickles. produce will be semi-processed in Jalihal with self-help groups taking care of these activities. Pre-processing will include slicing the produce, putting it in a brine solution and adding preservatives. Since most produce is available at a cheap rate only during certain times, semi-processing will be an important strategy to ensure that low costs are maintained. This program will provide income generating activities for self-help groups, minimize costs in production and reduce the time between picking of produce from trees and preserving.

Activities in Sangli:

As stated above, the following activities will be taking place in Sangli:

1. Final processing and packaging: will occur once the semi-processed product is ready to be fully processed. Storage of semi-processed products will take place in Jalihal and storage of fully processed products will take place in Sangli.
2. Marketing: feasibility studies and marketing strategy will initially be conducted / developed by Gagan and these activities will eventually be passed on to relationship managers hired by the organization. We seek to initially focus on the growing domestic market and will consider international markets based on available opportunities.

Products

Given the market supply-demand mechanics and the fungibility of fixed capital with these products, Yerala Projects Society will be processing ketchup, pickles, and jams. Please note that these products will require a FPO license that YPS will apply for this as soon as the project is approved. The rationale for choosing the products is included below:

1. *Ketchup:*

Tomatoes are available during the season at cheaper rates and prices start shooting up during the off-season. The reason for ketchup's rising popularity, in addition to demographic trends, is their extensive use as enrichers in making some fast-food items, and as additives with many food preparations. Hence, these products are witnessing increase in demand year after year. Tomatoes will be cultivated for the production of ketchup.

2. *Pickles*

Pickles are components of considerable importance in the Indian menu and hold a special place in the Indian palate. Pickles are the spicy condiments used along with not only staple foods, but also with other snack items of the households in India and elsewhere. Pickling of the locally available fruits and vegetables has become a seasonal traditional activity of Indian homes. With the recent demographic trend of women working, the time consuming pickling activity is no longer undertaken at the home and thus purchased in stores. What was once a traditional household preparation has now been a commercial venture catering to both domestic and international markets. Mango, tomato, lime, carrot, grapes and green chili will be cultivated for the production of pickles.

3. *Jams:*

Jams are popular fruit products that are often prepared at homes utilizing the available fruits. Again, the demographic trend of women working has led to a demand for the commercial manufacturing of jams for retailers. At present, jams and jellies have domestic market in the defense sector, institutional sector, bakeries and households. Mangos, papayas and grapes will be cultivated for the production of jams.

Financial needs:

Summary of Expenses		Donor		Local		Total	
		Rs.	Euro	Rs.	Euro	Rs.	Euro
A.	Food Processing Plant	3000000	54545	1600000	29090	4600000	83635
B.	Support to Women's Groups	1040000	18909	1265000	23000	2305000	41909

Loan amount of Euros 54545 for Food processing unit and Euros 18909 for Food Processing unit will be needed. To support SHGs we will be needing loan amount of Euros 18090 which will be used as revolving fund to support the SHGs. YPS and local people will contribute Euros 18909 for food processing and 41909 for supporting SHGs.

Repayment of the loan taken for Food Processing Unit will be repaid within 8 years. Loan amount for SHGs will be maintained as revolving fund and will be used by the SHG members regularly. SHG loan amount could be returned within 10 years.

Administrative Set-Up

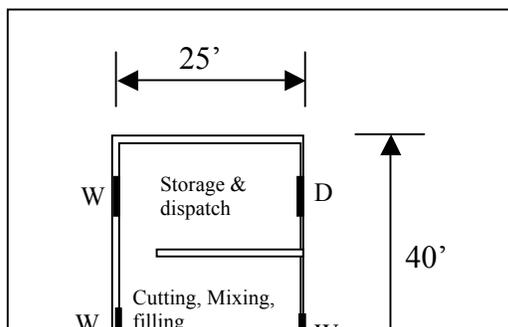
A project coordinator will be hired who will have previous experience in the food processing industry – this person will help manage the overall marketing strategy and food production operations in both Sangli and Jalihal. Three supervisors will be needed in total, one in Sangli and two in Jalihal; these supervisors will be responsible for managing daily-operations of the food-processing unit and ensuring quality of the raw materials and final product.

A consultant will be hired by Yerala Projects Society when first setting up the unit to ensure efficiency in production, to advise on factory layout and to transfer specific technology on production techniques. This should allow us to minimize quality issues from the outset, and thus concentrate on marketing a high-quality product.

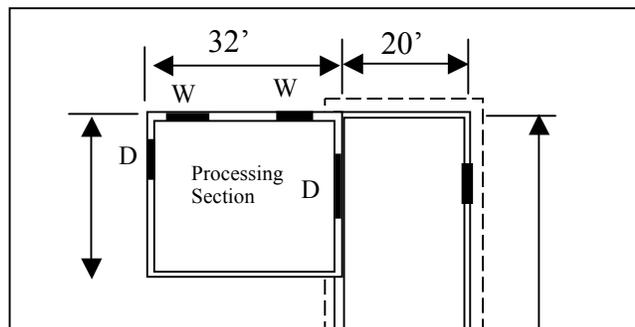
YPS will run the food processing unit and all the other allied activities. Local villagers will be practically trained in managing the unit over the period of 5-6 years. Ultimately the unit will be handed over to the co-operative, formed by the local villagers. YPS will exit ensuring the sustainability of the project.

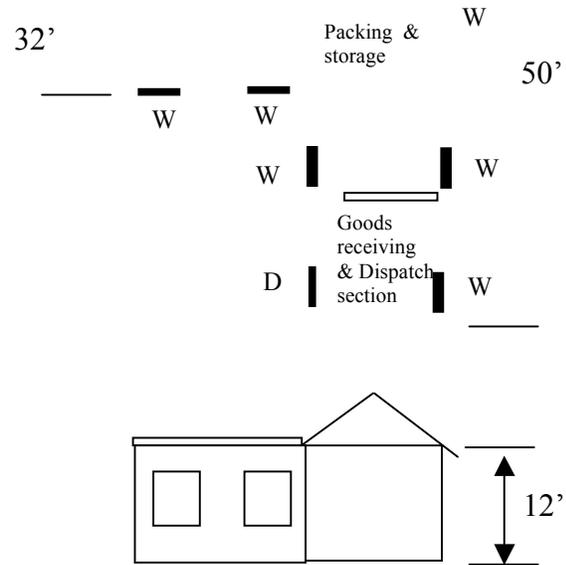
Building Layouts:

Jalihal:



Sangli:





Expected Outcomes:

1. Empowerment of women's Self Help Groups
2. Income generating activities in both Jalihal and Sangli
3. Increased employment
4. Delivery of high-quality product to customers
5. Transfer of technology and technical know-how to farmers for cultivation and processing
6. Allowing farmers to see their produce as being something beyond a commodity
7. Reduce wastage of produce
8. Diversify income sources from agriculture
9. Make a profit on food processing activities
10. Curtail migration and improve living standards in Jalihal region

