

“A Miracle Crop” - waiting for product diversification.

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Introduction:

In the present agricultural scenario of Manipur, one of the most critical challenges faced by the producer groups / farmers is the need for synchronizing production, processing and marketing thereof to the consumers. The demands of the consumers are so diverse in nature with high quality value added products at their affordable price. As of now, in most of the cases, not only primary value addition is missing but also farmers / producer groups have not been facilitated to link with markets due to non-existence of Agricultural Produce Market Committee to be functioned under the Agriculture Market Act thereby leading to distress sales at most of the time. Therefore, product diversification through food processing with improved quality and safety supported by relevant market intelligence is one of the means through which farming could emerge as a profitable enterprise.



Enhancing income through value addition:

Value addition / Food processing is an important issue that is hardly discussed either by the Public or Private Sectors except by very few entrepreneurs of the state. In spite of exploiting all the inherent potentials and utilizing available resources, the profits on agricultural commodities have greatly diminished as the costs of production coupled with agricultural inputs have increased faster than the market price of the produces. As a result, farmers are deprived off to the tune of 25-30 per cent of their calculated value of return even after taking into account the gains in increasing production and productivity due to adoption of advanced farming technologies. Now, in order to overcome these issues agriculture have to be managed as an agri-business rather than subsistence agriculture. Therefore, the strategies to achieve this goal needs to be handled in two different ways, that is to strengthen the production and delivery system coupled with increasing the farmers' earning through **efficient and effective value addition by selecting the judicious location specific crop, inputs and technologies**. This can be achieved only when agriculture is capsuled in a **Public- Private- Partnership (PPP) mode**.

Emergence of Farmers Producers Company as Project Partners:

Collectivizing farmers into Farmers Producer Company (FPC) have emerged as a new concept of empowering the farmers in dealing with production, processing, marketing & availing credit support and decision making. As such FPC have been considered as one of way to overcome the challenges faced by the small and marginal farmers. Under this new concept, as of now the following five Farmers Producer Company have been registered under Cmpnay Act 1956. T h e r e f o r e , availability of raw materials, will no longer be an issue for taking up any agro-based enterprise.

1. M/s Ireima Agro Producer Company Ltd. Singjamei Chanam Pukhri Mapal, Imphal 795008.
2. M/s Fidam Farmers Producers Company Ltd, P.O. Nambol-795134, Bishnupur.
3. M/s Langei Producer Company Ltd. Nagamapal Imphal-795001
4. M/s Iramdam United Food Prodducer Company Ltd. Kakching-795103
5. am/s Kangleipak Farmers Producer Company Ltd, Kwakeithel, Imphal -795001.

Prioritised Bio-resource for value addition:

Prioritising the well suited, the crop Soyabean *Glycine max* (L.) Merrill, belonging to family *Leguminosae* (alternatively *Fabaceae*) also known as “**Miracle Crop**” because of its inherent



diversified properties both as medicinal and high nutritional valued crop with its 40% protein and 20% oil, 35% carbohydrate and 5% ash contents has been identified as an excellent, versatile plant bio-resource that can yield a high value added commodity in just 100-120 days. It can also be further termed as a valuable ‘**Gift of Mother Nature**’ to human beings as it is the richest source of **Isoflavones**, the nature’s healing hormone.

Although, Soyabean can be used both as Oilseed (oil 20%) and as Pulse (Protein 40%); however due to non-availability of oil extractor in the state the crop is used as Pulse only. Since time immemorial, Soyabean has been cultivated favorably both in

hills and valley of Manipur. Considering its suitability and importance, Department of Agriculture Manipur has been promoting cultivation of this crop throughout the state. In Manipur area under Soyabean is around **5,200 ha** with a production figure of **4,510 tons** (Source Department of Agriculture, Manipur). This “**Miracle Crop**” could be a viable agri-business option for generating huge rural employment and income as the crop grows suitably particularly in all the hill districts and it can be easily value added in different forms of market driven products.



Soyabean products and its Nutrient:

The most nutritious and most easily digested food known amongst the Pulses/Oilseeds is the Soybean which has proved as one of the richest and cheapest sources of dietary protein with ***low saturated fat without cholesterol.***

Soybean protein provides all the essential amino acids needed for human health. The amino acid profile of soy protein is nearly equivalent in quality to meat, milk and egg protein. High quality protein content in Soyabean is equivalent to fish and animal protein that provides all the required Micronutrients of human body. Micronutrients



comprises of vitamins and minerals which are required in small quantities to ensure normal metabolism, growth and physical well being. Surprisingly, Protein content in 3 liters of cow milk is equivalent to protein content in 250 grams of Soyabean. Because of its high protein content and numerous health benefits easily available at the cheapest rate, this Miracle Crop is also graded as a **Superior Pulse** also known as “**Golden Bean**“. Thus the importance of soybean lies in the overall scope for agri-business and in its contribution to food supply as well as high medicinal properties. It is also termed as a valuable ‘**Gift of Mother Nature**’ to human beings as it is the richest source of **Isoflavones**, the nature’s healing hormone. *Therefore, the inherent potentials of the crop can be utilized for a wide range of industrial and pharmaceutical uses and the same can be harnessed for the benefit of small and marginal farmers by promoting cultivation & buy-back arrangement of the crop.*

As of now, out of the total quantities of Soyabean produced, 70% are mainly used for preparation of fermented soya food locally known as (**Hawaijar**) and the remaining quantities for preparation of boiled and fried dishes and sometimes sweet snacks etc. which is not in a profitable commercial agri-business but only in a subsistence form. However, this versatile crop, besides branding many food products viz. Soya Namkeen, Soya Papad, Soya Flour, Soya Nuts, Soya Besan, Soya Sweets, Soya sprout, Soya oil etc. the most profitable, market driven product is ‘**Soya Milk**’ and further value added products in concentrated forms are viz. Butter, Cheese, Paneer etc. In fact, Soyabean is the cheapest and best health food. Soya milk and related food products are becoming so popular throughout the world due to good nutritional values and medicinal properties.

****Health benefits of Soy foods and Soymilk:**

All Soy foods including Soymilk are high in protein, low in fat and contain no cholesterol. It is an excellent food for babies, children, elderly people and particularly for pregnant and lactating women as it contains vegetable protein, which is very nutritious and easy to digest. Besides possessing high nutritional values, the consumption of soy products has many health benefits, including protection against breast cancer, prostate cancer, diabetes, kidney diseases, heart diseases, menopausal symptoms leading to **osteoporosis** (*a disease occurring especially in women following menopause, in which the bones become extremely porous and are subject to fracture*). All these excellent health benefits are due to presence of significant amount of **Isoflavones**, gift of Mother Nature. Isoflavones are naturally occurring active compounds, highly antioxidant by nature. Research also have shown that the saturated fats and protein in **cows' milk** are comparatively unhealthy and help in increasing cholesterol level. But protein in **Soymilk** can decrease cholesterol levels. The **FDA** (Food and Drug Administration of US) confirms that Soy protein, as part of a diet low in saturated fat without cholesterol may significantly reduce the risk of heart diseases. The FDA recommends to incorporate 25gms of Soy protein in our daily meals for healthy living.

****Benefits of Fermented Soya:**

The end product of Soyabean fermentation process is locally called **Hawaijars**; produced by a host of beneficial yeast, mould and bacteria. This fermentation process is the oldest known form of food biotechnology and provides a means for producing safe and well-preserved foods. The fermentation process in soy removes **trypsin inhibitors** (*trypsin- is a digestive enzyme that breaks down proteins in the small intestine*) found on the coating of soy that interfere with the absorption of nutritive compounds. Fermented foods have a lot of health benefits. They are rich in enzymes, which help speed up digestion and absorption in our system. Now it is increasingly recognized that fermented soy products and its beverages have enhanced nutritive bioavailability while promoting heart and bone health, and alleviating menopausal symptoms. Fermented soybeans are also extensively used in the treatment of cancer-related symptoms including reducing the risk of prostate, stomach, and breast cancer and for counteracting the effects of chemotherapy and other forms of radiation.

Principle of Soymilk production process:

The process is so simple that preparation of **Hawaijar** is more difficult and complex rather than preparation of **Soymilk** from Soyabean. The basic principle of Soaking – Grinding – Boiling followed in the traditional method of Soymilk preparation is still used today in the modern high tech equipped processing plants. To start with for production of one liter of Soymilk we require 125 grams of well-graded clean Soyabean. The beans should be soaked in water for about 6-8 hours depending on the temperature of the water. After properly soaking, the hulls of the beans should be removed and washed by flushing water. Thus the cleaned soaked and soft beans are well grinded into a mesh/pulp and mixed with one liter of water and boiled for about 7-10 minutes. After cooling undigested fiber particles are sieved through a cheese cloth and Soymilk is recovered. The soymilk is

now ready for use and can be kept in a fridge. This is the basic simple principle of processing Soymilk. **However, to start with, for taking up commercial production / processing Units of Soymilk and other byproducts / beverages of different capacities with quality controlled conforming prescribed parameters as health food need to be designed based on the availability of resources.**

Economics:

It is technically validated that **1 kg. of Soyabean** yields **8.0 liters of Soymilk**. 1 liter Soymilk can be converted into 2 (two) liters of flavored Soya milk (Ready to Serve/RTS) or 1 kg of Soya curd or 200 gms of Soya Paneer. Therefore, applying very simple mathematics, we can easily calculate that one ton i.e 1000 kgs of Soyabean can produce 8000 liters of Soymilk equivalent to 16,000 liters of flavoured Soy RTS. Assuming to sell @Rs.20 per liter (whole sale rate) of Soymilk, the gross income would be Rs.1,60,000/- out of **1ton of Soyabean**. Now, deducting the cost of raw materials / Soyabean @Rs.35,000 per Ton i.e Rs.35/-kg plus the cost of processing and handling losses to the tune of Rs.25,000/- (max) per ton; the net income will be (1,60,000-60,000) = **Rs.1,00,000/-**. This income is based on single product of Soymilk. Depending on consumers demand varied byproducts can further be diversified. State's recorded production of Soyabean is **4,510 tons**. Assuming to utilize only 50% of the total yield i.e. 2,255 tons for preparation of **Hawaijar** and other traditional food items etc., and the remaining 50% (2,255 tons) for processing Soymilk; there is scope for generating huge employment and income to the tune of (1.00 X 2255) = **Rs.2,255 lakhs** from the processed products in addition to this Farmers / producer groups will get a gross income of **Rs. 7, 892.5 lakhs** exclusively from the sell of Soybeans as their farm produces @Rs.35,000/- per ton. (*Procurement & Sale Rates are subject to changes*)

Conclusion:

The present demand of milk and its beverages in Manipur is so large and there exists a big gap between demand and supply chain, that is normally supplemented by the products sourced from other states with the outflow of huge amount of state's exchequer. Organic Soymilk and its byproducts that can be produced and processed in the state could be an excellent gap filler between the demand and supply chain. Now, for setting up a small or medium size processing Unit of Soy food products; **Raw materials, Manpower and required Technologies are available**. Financial supports to the tune of 40% of Promoter's contribution can be availed as **Venture Capital Assistance** (*interest free loan*) from Small Farmers' Agri-business Consortium. In addition to this, grant-in-aid to the tune of 50% will also be available from the Ministry of Food Processing Industries GOI under the Centrally Sponsored Scheme of National Mission on Food Processing.

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