

# INDIA'S FIRST ORGANIC KIWI WINE BY LAMBU-SUBU FOOD AND BEVERAGES: A CASE FROM ARUNACHAL PRADESH

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## ABSTRACT

This is a case study on Lambu-Subu Food and Beverages, located at Hong village, Ziro valley of Arunachal Pradesh which produces Kiwi wine and was considered as the first organic wine of India. Kiwi or Chinese gooseberry is a fruit that is rich in vitamin C, with various nutritional property and health benefits. The annual average Kiwi production in India is 8.5 thousand tonnes from about 4.63 thousand hectares of land. Arunachal Pradesh is the leading state in Kiwi production accounting for 56% of total production. Wine is one of the value-added products formed by using fermentation process. At study area, Kiwi fruits were abundantly grown by farmers; so many times, kiwi fruit was left to decay in the field or fed to animals. So, transforming the kiwi fruits to its processed product as Kiwi wine was the best decision to solve the farmers' problem. This fascinating determination by Mrs. Tage Rita turned her into an entrepreneur who was an engineer earlier. Thus, she quit her government job and became chief managing director of Lambu-Subu Food and Beverages, which was established in the year 2016. Thus, the first organic Kiwi wine in India is produced by Lambu-Subu Food and Beverages named as "NAARA-AABA". The brand name "NAARA-AABA" was given as tribute to Mrs. Tage Rita's father-in-law because he was lovingly known by that name. The steps involved in producing kiwi wine are Weighing, cleaning, crushing, fermentation, racking, blending, fining, filtration, cold stabilization, bottling, capping, labeling and storage. The winery produces two different quantities of product i.e., 375ml and 750ml bottles. The processing cost of 1 quintal of Kiwi fruit wine was ₹8889 having per quintal returns of ₹74,089. Thus, the value addition of 1 quintal Kiwi was ₹8889. Though the industry has considerable income it has to face some constraints such as market competition, lack of awareness of product, lack of credit support from financial institution, less trained farmers and even no variety specific orchard. The SWOT

analysis of the industry reveals that pure organic nature of wine with its quality processing was its strength. Lack of cold storage to prevent the fruit spoilage was weakness for the industry. Serving livelihood to farmers along with employment generation were the opportunities. Low media coverage and competition from national brands were few of the threats. The takeaway message from this case study is a) awareness about Kiwi fruit both from nutritional value and commercial value is necessary, along with this, b) the winery should explore their processing capability to other fruits like Plum, Peach, Pears and Oranges were few of the recommendations to industry.

**Keywords:** *Arunachal Pradesh, Constraints, Kiwi wine, Lambu-Subu Food and Beverages, NAARA-AABA, SWOT analysis, Value addition.*

## **INTRODUCTION**

Kiwi (*Actinidia deliciosa*) or Chinese gooseberry is a native to Northern China, which was considered to be a wild fruit which was mostly eaten for medicinal purposes. At present Kiwi fruit is grown widely in New Zealand, Italy, USA, China, Japan, Australia, France, Pakistan, Iran, Kashmir, Chile and Spain. Italy is the largest producer of Kiwi in the world followed by New Zealand and Chile (FAOstat.org).

Kiwi is known to be rich in Vitamin C, which is great oxidant. It has huge health benefits like it improves respiratory health, helps in digestion, lowers the blood pressure which in turn decreases the likelihood of heart attack, promotes bone health and it contains possible anti-cancer properties, boosts the appearance of skin and improves eye health, weight loss. Arunachal Pradesh, Karnataka, Uttarakhand etc. having been very newly introduced in the country, estimations of area and production have not become available yet may be because they are not mostly grown locally in India. In India, it is a relatively new fruit and grown in Himachal Pradesh, Uttar Pradesh, Jammu and Kashmir, Sikkim, Meghalaya, Arunachal Pradesh, Nagaland, Manipur. The annual average Kiwi production in India was about 8.5 thousand tonnes from about 4.63 thousand hectares. In India kiwi fruit season is from October to December, with several varieties coming and going in this time. The kiwi varieties found in India are Hayward, Allison, Abbot, Bruno, Monty and Tomuri. Kiwi fruits

remain slightly pricey all through the season in comparison with fruits such as Apple, Mango, Orange, Banana. Since, it is expensive, fruit has relatively low per capita consumption in India and mostly restricted to the higher earning group. With the escalating import of Kiwi fruit over the years, its demand is growing extensively among other income groups too.

### Production and Share of Kiwi in India

State	2012-2013		2013-2014		2014-2015		2015-2016	
	P	S	P	S	P	S	P	S
Arunachal Pradesh	4.72	65.86	4.06	49.27	4.80	56.48	6.05	56.83
Nagaland	0.42	0.42	2.40	29.12	2.40	28.24	2.44	22.92
Mizoram	0.69	9.63	0.88	10.69	1.03	12.12	1.02	9.58
Sikkim	0.78	0.78	0.79	9.59	-	-	0.79	7.42
Himachal Pradesh	0.56	7.81	0.11	1.33	0.26	3.06	0.34	3.19
Jammu & Kashmir	-	-	0.01	0.12	0.01	0.12	0.01	0.09

P = Production in '000 tonnes; S = Share in % to total

(Source: National Horticulture Board, Horticultural statistics 2018)

Arunachal Pradesh is the largest state among all the North-Eastern states and its major portion falls under mountains and hills with an elevation between 60 meters and 7300 meters. They basically come under the Himalayan and Patkai ranges of mountains. Arunachal Pradesh is the leading producer of Kiwi fruit in India having 56% of the total production (Gyanendra *et al.* 2018). Lower Subansiri district is the highest producer of Kiwi from Arunachal Pradesh. Though Kiwi fruit was grown in abundance there, Kiwi farmers were native to explore its full potential in terms of price and market. The Kiwi fruit was left to decay in the field or fed to animals. So, the fascinating decision by Mrs. Tage Rita to solve the farmer's problem and also to preserve its nutritional value along with to enhance the commercial value of Kiwi turned her into an entrepreneur. So, she owner of Lambu-Subu Food and Beverages who was an engineer earlier. Value addition is one important component of nutritional security. Sometimes surplus production is the cause of lower price of produce in the market. one way to solve the problem is through value

addition of agricultural produce. Thus, it is an important technique to profit maximization and important pillars of nutritional security. As a result of the transformation in the physical state of the product, the customer for the product is expanded and a greater portion of revenue resulted from the processing, marketing or physical segregation is offered to the producer of the product.

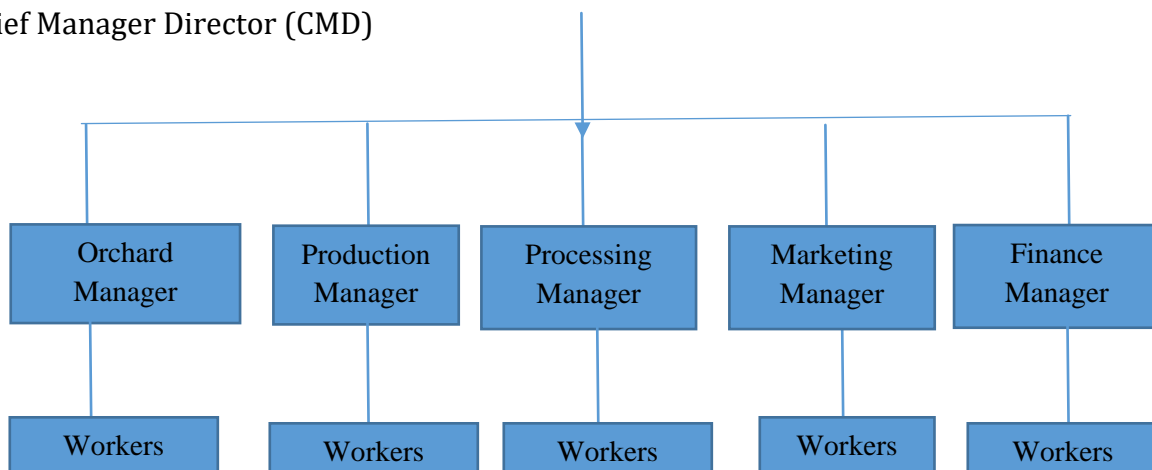
Lambu-Subu Food and Beverages is located at Hong Village, Ziro Valley in Subansiri district of Arunachal Pradesh. It was established in the year 2016. The chief managing director of the firm is Tage Rita, she had a secure government job, but she quit her job so that she can serve the people of the state by venturing into boutique winery of Kiwi fruit. “NAARA-AABA” is the India’s first organic Kiwi wine in India produced by Lambu-Subu Food and Beverages. The brand name “NAARA-AABA” was given as tribute to Mrs. Tage Rita’s father-in-law because he was lovingly known by that name. This transformation from Kiwi fruit to wine production will also lead to explore the full potential in terms of market and price. So, being a farmers’ daughter, the owner of the firm thought that making wine was the best decisions to preserve the nutritional value as well as solve the grievances of the farmers.

Keeping in view of the above – mentioned background, the study was taken up with following objectives:

1. To study the value addition of kiwi fruit.
2. To find out the constraints faced by the firm.

### Organizational structure

Chief Manager Director (CMD)



So, at the top most level is the chief Managing Director, below are the Orchard Manager, Production Manager, Processing Manager, Marketing Manager and Finance Manager. Each of the managers manages the workers below them. The aim of the Lambu-Subu Food and Beverages is to ensure that there is no wastage of Kiwi fruit and also to increase the economic value of the fruit through value addition. Along with this, to encourage the youth and rural people to venture into Kiwi cultivation and to ensure that the farmers get good returns for their produce is one of the missions of the firm.

### **Products**

The major product marketed by Lambu-Subu Food and Beverages is “NAARA-AABA” Kiwi wine. It was considered as the first organic Kiwi wine of India. It is an attempt to preserve the fruit in the best form and taste. NAARA-AABA wine retains all the nutrients of fresh fruit in the most organic manner and taste. The owner of the firm said that it comes with an environmentally conscious practice and trend and its endeavor is to lead the energetic villagers, young and old towards self-employment, dignity of labour and a sustainable and progressive farming life.

The unit has processing capacity of 60,000 liters’ and can accommodate all the Kiwis produced in the state in a single batch. The wine is available in the market at 375ml bottle which costs ₹600 and 750ml bottle costing ₹1500 in Arunachal Pradesh. In other states like Guwahati one 375ml bottle costs ₹800 and 750ml costs ₹1600 due to the transportation charges and the excise duty paid to the Assam Government.

### **METHODOLOGY**

Lower Subansiri district of Arunachal Pradesh which spreads over an area of 83, 743 km<sup>2</sup> with a population of 1,383, 727 as per census 2011 was taken up for the study. Arunachal Pradesh is located between 26°28’ North and 29°30’ North latitude and 91°20’ East and 97°30’ East longitude. Due to topographical diversity, the climate in Arunachal Pradesh ranges from sub-tropical to temperate depending upon the altitude. The regions in the lower belts of the state experience hot and humid climates, with a maximum temperature in the foothills reaching upto 40°C (during the summer). The average temperature in this

region in winter ranges from 15° C to 21° C while at during the monsoon season remains in between 22°C to 30°C. The middle belt in Arunachal Pradesh experiences micro thermal climate. The average rainfall recorded in Arunachal Pradesh is 300 centimeters, varying between 80 centimeters and 450 centimeters. The study was conducted at Lambu-Subu Food and Beverages located at ziro valley, lower Subansiri district, Arunachal Pradesh, as they work exclusively in the field of horticulture and allied services facilitating skills training, value addition, product development and supply chain management through the adoption of scientific and innovative methodologies.

The study was based on primary and secondary data. Primary data was acquired using the questionnaires and personal interview for obtaining necessary information pertaining to the objectives from the owner and some employees of the firm. Secondary sources like literature review, web sources, journals, records of the company, etc were also used for acquiring the required information of the study interest.

## **RESULTS AND DISCUSSION**

### **To study the value addition of Kiwi fruit**

Value addition is change in the physical state or form of the product (such as Kiwi wine from Kiwi fruit). It is the production of a product in a manner that enriches its value (such as organically produced products). It is an important technique of Profit maximization for any business.

### **Procurement of Raw material**

The raw materials were procured from the local farmers at ₹100 per kg from farm gate as well as from their own kiwi orchard of approx. 4 ha having around 300 plants. The producer of the company procures about 95 MT of Kiwi every year for processing of Kiwi wine. Post-harvest management practices play a very crucial role in deciding the economic value of the product in the market. The harvested fruits were sorted, graded and packet at farm level. The sorting, grading and packing was done entirely manually and there was no mechanical sorting, grading line or pack-house in the district for Kiwi. The broken or very small size Kiwi were sometimes fed to pigs as the farmers perceive that his way it enhances

the yield of pork. Moreover, some farmers prepare homemade Kiwi wine for self-consumption with lower grade/ damaged Kiwi.

### **Processing of raw material**

The processing of Kiwi fruit in Lambu-Subu Food and Beverages industry involves the following steps:

1. **Weighing:** The Kiwis were brought to the winery and it was weighed with the help of a platform scale. The weighing was done by keeping the Kiwi fruit on a tray and the average weight of the tray filled with Kiwi was 20kg. After weighing the Kiwi was sent for the cleaning process.
2. **Cleaning:** Cleaning in agricultural processing means the removal of foreign matter and undesirable matters from the desired product. This may be accomplished by washing, screening, hand picking etc. Kiwi after weighing was dumped in the washing container for removal of undesirable matters. The cleaning was done manually by hand. Once the cleaning was done the washed kiwi was forwarded to the next step i.e., crushing.
3. **Crushing:** Crushing the process of size reduction in which the Kiwi fruit was cut or broken into smaller pieces or reduced to workable size. The crushed fruit was then pumped to the fermentation tank through a food grade pipe.
4. **Fermentation:** Fermentation is a metabolic process by which molecules such as glucose are broken down anaerobically. Microorganisms like yeast and bacteria usually play role in the fermentation process creating beer, wine etc. Fermentation process takes place in the fermentation tank.
5. **Racking:** Racking is a process of moving clear wine from one tank to another tank and removal of lees (solid particles) as a waste to gutter. The wine was racked from tank to another empty tank on a number of occasions. This help clarify the wine by removing the fine less or sediments. Temperature was maintained at 20°C before racking. Racking was done when the brix level becomes zero (Brix is the % of total dissolved solid of % of sugar).
6. **Blending:** Blending is a technique to produce the wine by mixing different strengths of tank in one particular tank. In the blending process the sample of wine was tasted and the standard was checked.

7. Fining: It is a process of removing unwanted material from wine while still in the cellar. It is part of the clarification and stabilization process and involves adding a substance to the wine that will flush out certain elements that may cause a wine to look hazy or affect its aroma, colour or bitterness. The fining agent binds to the unwanted particle in the wine, which means they become sizable enough to be filtered out.
8. Filtration: Filtration is any of various, mechanical, physical or biological operations that separate solids from fluids (liquids or gases) by adding a medium within which only the fluid can pass. Wines are filtered from time to time as per physical status of the wine. Particles and elements like yeast or bacteria were removed. It was done to give a clearer and healthier appearance and speed up the aging process.
9. Cold stabilization: Cold stabilization of wine is a method used to keep tartaric acid crystals from forming after the wine has been bottled. This process is referred to as cold stabilization as it is the act of cooling the wine that causes tartaric acid to form tartrate crystals, also known as wine crystals or wine diamonds. If wine is not cold stabilizes there is a chance that the crystals will form when consumers place bottles of wine in the refrigerator or store it for long periods of time.
10. Bottling: At first the bottles were washed with sterilized and micro filtered water and the bottles were dried out with an air shot and then 99.8% of nitrogen was added to the bottles. This process protects the wine tanks then two bottles at a time were filled with the designed quantity of wine.
11. Capping: Capping machines are used for the application of plastic and metal threaded caps as well as plastic snap caps, some fitments and some type of corks and plugs.
12. Labelling: Labelling is a process of dispensing, applying or print-and- apply labels to various items, products, containers, or packages. They were operated by hand and were not automated, but still assist in the process of removing labels from their liners. The products are rejected if the labelling was not done properly. Operation was performed by pulling the liner/backing paper around a plate or bar which cause the label to peel away from the backing paper. This happens because the backing paper is usually thinner than the label itself and is also underneath.



13. Storage: After processing of Kiwi wine, they were packed and stored in a box ready to be transported to the market.

### **Gross return per month**

1,250 numbers of 375ml quantities of wine bottle had a return of ₹6,25,000 having wholesale rate ₹500 per bottle. And 2,083 numbers of 750ml quantity of wine bottles had a return of ₹31,24,500 having a wholesale rate of ₹1400. So, the total return per month was ₹37,49,500.

### **Processing cost per month**

The total processing cost per month of Kiwi wine including all the particulars like electricity charge, water, packaging material, labour charge, miscellaneous etc. was a sum total of ₹12,03,950. Among all the particulars labour charge was the maximum i.e., ₹5,42,000.

### **Return from the sale of value-added fruit per month**

The return from the sale of value-added fruit per month of all the particulars are 1,250 bottles of 375ml and 2,083 bottles of 750ml were produced per month. About 2.5 kg of Kiwi fruit was required for bottle of 375ml and 5 kg for a bottle of 750ml. Therefore, in a month 135.4 quintals of kiwi were used for producing 3333 bottles of Kiwi wine, costing ₹12,29,000. Gross return was ₹37,49,500, total processing cost was ₹12,03,950, total cost (total processing cost + cost of raw materials) was ₹24,32,950 and net return (Gross return- Total cost) of ₹13,16,550 with benefit cost ratio of ₹1.56 and annual net return was approximately ₹1,57,98,000.

### **Value addition of 1 quintal Kiwi**

The total processing cost of 1 quintal Kiwi of all the particulars like electricity charge, water charge, packaging charge, labour charge and miscellaneous charge etc. was a sum total of ₹8889. Therefore, value addition of 1 quintal kiwi was ₹8889.

### **Return per quintal of Kiwi**

Since 1 quintal is equal to 100kg so from 1 quintal 28 numbers of kiwi wine bottles can be produced i.e., 12 bottles of 750ml wine and 16 bottles of 375ml wine can be produced. From selling 28 kiwi wine bottle the gross return was ₹24,800, total processing charge was ₹88,889, cost of raw materials was ₹10,000, total cost (total processing cost + cost of raw material) was ₹98,889 with net return (gross return-total cost) of ₹74, 089.

### **To find out the constraints faced by firm**

Some of the constraints faced by firm are as follows:

1. Market competition: various farmers have become aware of the commercial potential of Kiwi fruit; they have started preparing kiwi wine at home at small scale for their self-consumption or they sell it locally at a much lower price. This way the firm faces market competition.
2. Lack of awareness of the product: the customers were not quite aware of their products and their health benefits as it was newly introduced in the market.
3. Lack of credit support from financial institutions: The initial cost of establishing an orchard was capital intensive which was around ₹ 5 lakh per ha and farmers were capital constrained, they lack access to credit from banks and other such financial institutions. There was high inventory and transportation cost. This discourages the farmers from going for Kiwi plantation.
4. Accessibility: There was a problem of accessibility of the winery to the market as it was located at the remote area.
5. No variety specific orchard: The kiwi fruit in the orchard have a combination of varieties, and these when marketed without grading leads to low wine quality. This was because of the absence of variety specific nurseries.
6. Less trained farmers: Because of the less trained farmers there was untimely harvesting of kiwi fruit which degrades the kiwi fruit quality. Untimely harvesting takes more time for fermentation ultimately delaying the production of Kiwi wine.

## SWOT analysis

The SWOT analysis of the study was conducted in order to understand the Strengths, Weaknesses, Opportunities and Threats of the firm.

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>• The wine is purely organic, no chemicals added.</li> <li>• Quality processing of Kiwi wine.</li> <li>• Premium packaging for the premium taste of wine.</li> <li>• The brand gives regional identity and product traceability.</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of cold storage.</li> <li>• Perishability of the fruit.</li> <li>• Low numbers of products at the moment.</li> <li>• Processing is done in only one fruit Kiwi so need to take up other fruit as well for value addition.</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>• Generates employment opportunities for women as well as unemployed youths.</li> <li>• It serves as a livelihood to farmers.</li> <li>• Few competitors in the area.</li> </ul>	<ul style="list-style-type: none"> <li>• Competition from the national brands.</li> <li>• Changing customer attitudes towards the company.</li> <li>• Negative press/ media coverage.</li> </ul>

## CONCLUSION

At present the Lambu-Subu Food Beverages was the only processing unit in Arunachal Pradesh which was famous for its product Kiwi wine, India's first organic Kiwi wine. The winery has a processing capacity of 60,000 liters and presently there are two different quantities of Kiwi wine available i.e., 375ml costing ₹600 and 750ml costing ₹1500. The firm has a gross return of ₹37,49,500 per month cost of 1 quintal of Kiwi wine was ₹8889 having returns per quintal of ₹74,089. So, the value addition of 1 quintal of kiwi was ₹8889 and the constraints faced by the firm were market competition from the local kiwi wine seller, lack of awareness of the product among people, no variety specific orchard etc. The takeaway message from this study is (a) The winery should explore the opportunity of utilizing their processing capability using alternative fruit e.g., Plum, Pears, Orange, Litchi. (b) Awareness about Kiwi fruit both from nutritional value and commercial value side to tap commercial opportunities is necessary. (c) Owing to numerous nutritional value and health benefits, the demand for Kiwi fruit is increasing every year globally so there is a vast scope to upscale Kiwi cultivation in the North East region.

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