

## PROSPECTS OF COCOA PROCESSING AND VALUE ADDITION-AN EXPERIENCE IN UTTARA KANNADA DISTRICT

Vinutha U. Muktamath

Cocoa has potential of becoming an export crop, only if the farmers are equipped with post harvest technologies. It is also an export-oriented commodity. The programmes on processing and value addition will help to produce quality processed products to meet the international standards which in turn will improve the economy of farming community, generate sustainable employment opportunity and will reduce dependency on import and further drain of foreign exchange. There is immense potential for taking up farm level secondary processing of cocoa with small investment. It is possible to make eco friendly, highly nutritive and healthy cocoa products through home scale processing.

Cocoa is one of the important plantation crops which is gaining commercial importance in Uttar Kannada district. A well established local market for procuring cocoa produce is established in the district and many local co-operative societies are involved in the process. Krishi Vigyan Kendra, Sirsi took up a project on Post Harvest Handling and Value Addition of Cocoa -A Venture for Women SHG Entrepreneurs in Uttar Kannada District with financial assistance of DCCD , Cochin. The main aim was to take up venture in post harvest technology, value addition, preparation of homemade chocolates, biscuits and other confectioneries by women SHG's. The project has successfully trained the SHGs in the skill of preparing value added products, branding, marketing strategies and preparation of business plans. A linkage between women SHGs and local co-operatives has been established to capitalize the tourist flow resulting in financial empowerment.

### Introduction

Uttara Kannada is a district in the southern Indian state of Karnataka and is one of the biggest districts of the State having 11 taluks with abundant natural resources and vast geographical area of 10291 sq.kms. The district has varied geographical features with thick forest, perennial rivers and abundant flora and fauna and a long coastal line of about 140 KM in length. There are three rain fall patterns in the district viz. Coastal, transitional and hilly area. The average rainfall of the district ranges between 3548 to 1265 mm. The district's high rainfall supports lush forest, which cover approximately 70% of the District.

Due to a very diversified agro ecosystem which has distinct climatic patterns where differences in rainfall, vegetation, soil types, resource availability and its utilization, there is a distinct demarcation between hilly and coastal regions. There is an ample opportunity for the development of horticulture as well as agro-forestry.

The major plantation crops of the district are coconut, arecanut, cashew, mango, banana, pineapple, *Garcinia*, and sapota. Cocoa has become one of the important horticulture crops in the district as is being mainly cultivated as intercrop either with coconut or arecanut. Research findings and commercial adoption has amply proved cocoa as a best companion with coconut and arecanut. In the era of sustainable agriculture, cocoa suits as the best intercrop with coconut and arecanut in generating better economic returns for the farming community. Considering many constraints noticed in the

coconut and arecanut industry in India, cocoa can overcome the problem and enhances the economic condition of the farming community.

### Production Scenario of Cocoa & Future potential for cocoa development in Karnataka

According to Directorate of Cocoa and Cashewnut Development (DCCD), Government of India, 2009-10 statistics, the details of cocoa production in Karnataka is as follows. The 70% of the cocoa area in Karnataka is covered in Uttara kannada and Dakshinakannada districts.

Area - ha	Production - MT		Productivity-Kg/ha
Area	Productive Area	Production	Productivity
8958	7250	3006	415

As cocoa is mainly cultivated under irrigated coconut and arecanut gardens availability of such areas in Karnataka will therefore offer considerable scope for its development. These areas are mostly irrigated in nature hence definitely will be suitable for cocoa as an intercrop. So every year the area of cocoa is increasing specially in Uttara Kannada district of Karnataka.

### Cocoa in Uttara Kannada

Through NHM cocoa was cultivated in 1,332 Ha under area expansion programme which was implemented up to 2009-10. The potentiality of the cocoa area expansion is around 17,500 Ha. that means, UK has 16,078 Ha of Areca and 7,521 Ha of Coconut area in it. Out of 23,599 Ha. around 1000 Ha is having cocoa as intercrop. For the present financial year 300 Ha. of Cocoa area expansion is in the implementation stage. Remaining 21,500 Ha. can be utilized for cocoa expansion. In that around 75% area can be taken up. Out of the 21,500 ha., 17,500 ha. can be taken up for the Cocoa intercrop. As cocoa is mainly cultivated under irrigated coconut and areca nut gardens availability of such areas in Karnataka will therefore offer considerable scope for its development.

### Export- Import Scenario

Cocoa has a potential of becoming an export crop only if the farmers are equipped with post harvest technologies." It is also an export-oriented commodity. India has gained a foreign exchange of more than Rs. 166.00 crores during the last 3 years. The current domestic production of cocoa beans is not sufficient to meet the demand of the industry. Hence India had to Import nearly 19,000 MT of cocoa beans along with cocoa products to make up the shortfall. During the last 3 years we have imported cocoa beans and its products valued Rs. 568 crores where our export value for the year 2009-10 is only 36.041 lakhs.

Hence the programmes on processing and value addition will help to produce quality processed products to meet the international standards which in turn will improve the economy of farming community, generate sustainable employment opportunity especially in rural areas and will reduce dependency on import and further drain of foreign exchange.

### Strengths

- The District has varied agro-climatic regions suitable to grow different horticultural crops.
- District has good irrigation source, 6 rivers are flowing in the district.
- Farmers of the districts are well educated, progressive and intellectuals- in respect of advanced technologies.
- Specialist Scientists are available in ARS (Pepper), EEU and KVK of UASD.
- Sea and airports are within the 200 KM range.
- Availability of small-scale food processing industries like cashew, pineapple, coconut and vanilla processing industries, render much scope for area expansion of such horticultural crops.

- Good response of co-operative movements in the district. TSS and kadamba marketing Co-op Society are the biggest co-operative societies in Horticultural Sector.
- Farmers are practicing traditional organic cultivation.

#### Opportunities

- Large area under Arecanut and coconut, the inter space creates multistoried cropping systems giving scope for Cocoa area expansion
- Availability of large amount of organic matter from the forest sources leads to organic farming.
- Soil & climatic conditions are most suited for Horticulture crops.
- Scope for agro processing and value addition units.

#### Cocoa Processing

Cocoa processing starts from procurement of raw cocoa beans and ends at the delivery of cocoa products such as cocoa wibs, liquor, cocoa butter, and cocoa powder to the confectionery industries domestically and internationally like chocolate, cookie, baking, pharmaceutical, flavoring and other such industrial segments .

There is immense potential for taking up farm level secondary processing of cocoa with small investment. It is possible to make ecofriendly, highly nutritive and healthy cocoa products through home scale processing. The method consists of roasting cocoa for about 20 minutes, removing shell manually, grinding in wet grinders for one hour, separating the butter and cocoa powder using the cocoa butter extractor and utilizing the powder and butter for the production of milk chocolate, white chocolate, drinking chocolate etc. The entire production in the country is presently being procured by the private corporate agencies @ Rs.140-160/kg of dry beans. Farm level value addition using the technology standardized by the Kerala Agricultural University can offer a higher price of at least Rs.

2000/kg on an average, thereby assuring cocoa farmers of a remunerative income from growing cocoa.

Cocoa industry in the country has expanded considerably in recent years. Many confectionery manufacturing units are processing cocoa among those chocolate industry is gaining momentum. With rapid growth and changing habits of people, chocolates have gained popularity among masses. Chocolates and confectionery have indulged the mankind, in its various tastes and forms.

The implementation of cocoa development programmes will generate quality raw material for domestic processing, production will enhance, improve the economy of farming community, generate sustainable employment opportunity especially in rural areas and will reduce dependency on import, and further drain of foreign exchange.

Cocoa is one of the important plantation crop which is gaining commercial importance in Uttar Kannada district. About 1500 ha is covered under Cocoa cultivation. The department of Horticulture has brought many programmes to encourage the farmers in the district to take up cocoa cultivation. About 2750 tonnes of wet beans and 550 tonnes of dry beans is produced in the district. A well established local market for procuring cocoa produce is established in the district and many local co-operative societies are involved in the process. It is expected that the present area coverage and yield is going to double in the next 2 years. Many women progressive farmers are involved in cocoa cultivation and also women SHG movement is strong in the district.

Hence with the following objective KVK, Sirsi took up a project on Post Harvest Handling and Value Addition of Cocoa -A Venture for Women SHG Entrepreneurs in Uttar Kannada District with financial assistance of DCCD , Cochin. The main aim is to take up venture in post harvest technology, value addition , preparation of home made chocolates, biscuits and other confectioneries by women SHG's, which

ultimately helps in building rural women entrepreneurs.

**Objectives :**

1. To Educate women SHG's about importance of processing and value addition of cocoa.
2. To Train women SHG's to prepare homemade chocolates, cakes, biscuits, and other confectioneries.
3. Empowering women SHG's on quality cocoa products preparation, packaging and market Linkage
4. To test the nutritive value of the products
5. To build a successful supply chain system for cocoa products.

**Material and Methods**

1. **Sample :** 6 SHG's from 3 taluks of the district namely Sirsi, Sidapur and Yellapur comprising 20 members each were selected and bench mark survey, pretest and other baseline data were collected. The details of the villages are as follows.

**Table I. Demographics of SHG members:**

Figures in oarantthesis indicate percentage n = 120 (Number of members)

Sl. No.	Variables	SHG-I Neernalli
<b>I.</b>	<b>Age</b>	
a.	Younger (<30 years)	48 (40.00)
b.	Middle (30-40 years)	31.6 (60.00)
c.	Older (>40 years)	28.3 (30.00)
<b>II.</b>	<b>Education</b>	
a.	Lliterate	-(0.00)
b.	Primary	60(50)
c.	Secondary	22(18.3)
d.	Above Secondary	26(21.00)
<b>III.</b>	<b>Family type</b>	
a.	Nuclear	62(51.6)
b.	Joint	58(48.3)
<b>IV.</b>	<b>Family size</b>	
a.	Small (< 4 members)	21(17.5)
b.	Medium (4-7 members)	75(62.5)
c.	Large (> 7 members)	33(27.5)
<b>V.</b>	<b>Total annual income</b>	
a.	Low (<30000)	42(35.00)
b.	Middle (30000-50000)	58(48.30)
c.	High (>50000)	20(16.6)
<b>VI.</b>	<b>Caste</b>	
a.	Hindu Havyaks	36(30.00)
b.	Hindu Nayak	20 (20.00)
c.	Siddhis	60(50)
<b>VII</b>	<b>Taking up enterprises</b>	12(10)

Sl.No.	Name of the	Village	No.of farm	Remarks
SHGI	Sirsi	Neernalli	20	
2	Sirsi	Gadigehole	20	
3	Siddapur	Killar and Menasi	20	
4	Yellapur	Ummachgi (Kotemane)	20	The Siddhi tribal women SHGs have been selected in yellapur
5	Yellapur	Ummachgi (Hullarmance)	20	
6	Yellapur	Gullapur	20	

Most of the SHG farmwomen were in the middle aged group, had primary education with medium size family and middle income group. 50% belonged to siddi tribal group and other to prominent havyak and nayak castes. Only 10 percent of these farmwomen were involved in different enterprises like dairying , tailoring and pappad , chips making

**2. Village level training :** 6 village level trainings for each SHG on the following topics were covered. Training and demonstration were conducted to farm women SHGs.

1. Commercial and Medicinal value of cocoa and opportunities in marketing
2. Post harvest handling and processing of Cocoa seeds
3. Preparation of homemade chocolates ,biscuits and confectioneries from cocoa
4. Packaging, pricing and marketing of cocoa value added products.

**3. Institutional Training:** Three days Institutional Training at bakery unit in two batches for selected members of SHGs to give intensive training on value added products preparation. Total 38 farm women from different SHGs took intensive training.

**4. Development of Value added Products :** Based on the experience and consumer choice different value added products were developed and standardized. The recipies were standardized with cocoa powder incorporation at 50gms, 75gms and 100gms with other basic ingredients. Sensory evaluation tests were carried out to know the consumer acceptability of the products by a panel of 15 home scientists using 5 point Hedonic scale (Ranganna 1986)

**Products Developed Under the project**

1. Choco Bite
2. Nutty Choc
3. Chikki delight
4. Coco Chips
5. Krishi choco bar
- 6 Choco bar
7. Chocolate Drink
8. Chocolate cookies
9. Chocolate cake
10. White chocolate

**5. Analysis of nutritional Composition -** The chocolates developed were analysed for proximate composition, minerals like calcium and iron by lab analysis at Pristine laboratory, Bangalore, which is approved by Government of india.

**Nutritive value of the products developed to be launched commercially :**

Sl. No.	Particulars (in 100gms)	Moisture	Proteins	Fat	Total	Car boh	Energy ash	Ca ydrate	Iron (k.Cals)
1	Chikki delight	6.83	10.26	32.63	2.33	47.95	526.51	0.20	7.9
2	Choco Bite	8.80	9.34	21.26	2.37	58.23	461.62	0.35	5.4
3	Choco bar	0.54	10.86	40.89	1.77	45.94	595.21	0.22	7.0
4	Coco chips	10.52	8.48	23.91	2.22	54.87	468.59	0.19	6.0
5	Krishi choco bar	1.78	8.42	34.41	1.69	53.70	558.17	0.42	4.0

(Analysis done by Pristine Laboratory, Bangalore)

**Shelf Life** - The products developed were stored to know the shelf life and found that can be stored safely for 2 months.

### **Branding and Marketing**

A value chain is a sequence of interconnected business activities that ultimately add value to products or services as they move through production, processing, marketing and sales - usually involving input from multiple businesses. During this process, inputs, raw material, services, intermediate and final products are owned by different actors or stakeholders. Each actor in the chain adds value to the product. Public and private services such as business development services, certification, labeling, packaging, transportation and financial services also play a crucial role in the value chain, as do laws, regulations and their enforcement. However, many small-scale producers lack both the means and the skills to participate in existing value chains and because of their relatively weak negotiating power, risk being exploited. Many also lack access to market information and, coupled with a tendency to avoid risk, often miss viable business opportunities. Furthermore, market regulators often favor certain interest groups and may not be well informed about market conditions. Combined, these factors can lead to market distortions that exclude small-scale producers and leave potential market opportunities unexplored. So the SHGs were trained in pricing, branding and packaging. All the products are marketed under the brand name Krishi and released to market. Market linkage to SHGs has been made and they are linked to Kadamba Marketing Co-operative Society, Sirsi and LAMPS society, Yellapur. A sample marketing on cost benefit ratio has shown 25 -30 % profit as the entrepreneurship is in initial stage.

### **Future Issues and strategies**

The project has successfully trained the SHGs in the skill of preparing value added products, branding, marketing strategies and preparation of business plans. The opinion of the beneficiaries in the project is positive towards establishing the enterprise. They expressed for financial support from the university or any organisation. So, the future issues before us is,

- **Capitalizing the tourist flow in the district**
- **Establishing one model small scale demo unit at University of Agricultural sciences, Dharwad with the help of external funding**
- **Establishing a small scale unit of home made chocolate unit by linking SHG with NGO at Sirsi & marketing in large scale by external funding.**

### **Conclusion**

Cocoa serves as an important crop around the world : a cash crop for growing countries and a key import for processing and consuming countries. Cocoa farmers are getting less margin and can be empowered through adoption of processing technologies. In this direction the production technologies and value chain in the niche areas can be developed for further profitability to improve status of people and promotion of cottage scale industries for production of value added products of cocoa.

In recent years Self-Help Groups have become significant institutions for rural development. It is now being increasingly realized that instead of targeting the individuals in the process of development, it would be more useful to adopt the approach makes available the collective wisdom and combined resources for any task. Hence interested cocoa farmer can be selected, trained, guided to become empowered in the area of cocoa value addition.