Options to develop economic sustainability for farmers in Kumbaraiyur

This case focusses on creating an business model for the cocoa cultivators as this is the region which cultivates one of the best quality in cocoa. Requirements are high in the markets but cultivators are not aware of many and do not know what could get them a better price for their livelihood. Suggestions could be made on how cocoa or other produces can be beneficial to the community and sustain the interest of the community to continue in this.

Introduction and Background

Kumbaraiyur a village in Kodaikkanal block in Dindigul district of Tamilnadu is located 44 kilometers towards west from district headquarters Dindigul and 35 kilometers from Kodaikkanal. Kumbaraiyur is widely known for the bigger size of the cocoa beans produced. It is because of the suitable tropical climate, abundant rainfall and altitude. Kumbaraiyur boasts a cultivable land area of 900 acres with forest covers between their farmlands. Contribution to the economy of Kumbaraiyur is primarily through agriculture. There are around 150 families living in Kumbaraiyur with a total population of about 630. Of which 90 families are involved in farming either as growers or farmers. Cocoa is cultivated on a large scale on an area of about 250 acres and Kumbaraiyur produces the best quality of cocoa in Tamilnadu. Besides cocoa, people are mainly adopting mixed farming, including the cultivation of pepper,avocado, banana, starfruit, orange and red chillies. The population of people belonging to the age band of 26 to 45 is literate and majority of them have studied up to class 10th. After acquiring basic education, they have moved to do farming. The youngsters are well aware about the process of cultivating cocoa and the various difficulties in growing them. Water, both for drinking and other general purposes are supplied from the government in an interval of 4-5 days. The drainage facility in the village is very poor. Due to the delay in conducting the local body elections, people did not know whom to approach to fulfill their basic needs. The villagers were also deeply concerned about the unavailability of proper road facilities to their farms. As a result of this, they face inconvenience in the transportation of goods to and fro their farms.

Cocoa production and Demand

In the four southern states, the total area under cultivation for cocoa at the end of 2015-2016 was 81,274 hectares. According to data from the Directorate of Cashewnut and Cocoa Development (DCCD), the cocoa beans production of India grew at a compound annual growth rate of just 3.6%. According to Euromonitor International, the size of the Indian chocolate confectionary market in 2016 was around Rs.11,260 crores. The top player is Mondelez India (formerly known as Cadbury India) controls close to half of the market.

YEAR	PRODUCTION (in tons)	DEMAND (in tons)	TOTAL AREA

			(ha)
2013-2014	15133	26000	71365
2014-2015	16050	28500	78000
2015-2016	17200	30000	84000

Need of the project:

The main motive of this project is to improve the socio-economic conditions and economic sustainability of cocoa farmers and growers in Kumbaraiyur village, Kodaikanal. The environmental factors such as, unpredictable and reduced level of rainfall has brought down the yield to a minimum of 50% of the actual produce in the last few years. The production of cocoa has decreased exponentially in this village compared to last 5 years and people have slowly started to migrate to other crops for better profit. If this practice continues, there will be no cocoa farms from this village, which is said to have the best soil, rainfall and climate for cocoa production, thereby losing a share of major revenue for the country and also loss of livelihood for the people in the village.Contribution to the economy of Kumbaraiyur is made mostly by agriculture. Black pepper, white pepper, organic pepper, butter fruit, banana, orange and coffee are other major cash crops grown in this village.The cocoa wastage also remained as an unexplored spectrum and the ratio of cocoa beans to cocoa wastage which was 1:4 (in the initial stage, wet and non-dried) also gave a lot of scope to unleash the opportunities to make monetary value from the waste. The scope of the project was to increase the yield in the farms through planting hybrid varieties and adopting drip water irrigation, new buyers can be brought in and the farmers of Kumbaraiyur will be able to demand competitive prices from them. Also by using panchakavya as organic manure has a positive effect on the size of the cocoa beans, which is actually preferred by most of the buyers. By using these measures, the yield in the 150 acre cultivable land in Kumbaraiyur, which was 13 tons for the year 2017-2018 can be increased by almost 60% i.e. 21 tons. This will eventually lead to the increase in cocoa waste, especially cocoa pods that is used as fuel for the drier machine for cocoa beans. Using this machine, the drying process which takes around 8 days at humid climate can be made possible within a day. Also the quality of the cocoa beans increases and the farmers will be able to supply cocoa beans even during high demand. In addition to these, there are various uses and advantages for the byproducts and end products that can be obtained from cocoa.

The various other options available for developing economic condition were cocoa shells and husk can be used to control the growth of weed growth in the farm. It is seen that the antioxidant power (ORAC) in cocoa is very high. This can help protect against ageing, tumors etc. Dried husk may be used as a feed for poultry, pigs and sheep. Fermentation of cocoa husk with Pleurotus ostreatus improved its feeding value and increased its usage in broiler diets to 20%.The ash produced when sun-dried cocoa pod husk is burnt contains about 40% potash, which can be used for making soft soap and liquid soap. It can also be used as an absorbent. Cocoa butter can be extracted from discarded cocoa beans and may be used in the

production of moisturizer and body pomade .Farmers of Kumbaraiyur who are now moving to the cultivation of other crops due to the low yield of cocoa on account of decreased rainfall, can be encouraged to use their resources effectively to concentrate more on cocoa cultivation and increase its yield. Also the uses of various wastes of cocoa including cocoa pods and cocoa shells or cocoa husks can be made useful and the economic conditions of the farmers can be quadrupled within a period of 10 years.

After an in-depth analysis on options a couple of ideas have sprouted for implementation. They are:

Creating awareness among farmers and educating them to plant hybrid saplings. Hybrid cocoa saplings are supplied by Mondelez international (Cadburys) for free of cost. The government of Tamil Nadu and Mondelez encourage the farmers by providing subsidies to grow these saplings. These saplings consume low levels of water and provide better yields in the immediate term that is within 3 years compared to the original yields which provides proper yield only after 7 to 8 years. Farmers can get better and faster yields. Hybrid trees are short and therefore easy to maintain. They give out their first yield just after three years of planting. They are resistant to insects and pests. Consumption of water to yield per tree is low in hybrid trees than native breed trees.

Adding value to cocoa waste and generating revenues by selling them. Cocoa pods are left to dry for a period of 1 year by packing in a sack bag without exposure to direct sunlight, rainfall or even moisture. Such a product after a period of 1 year has high calorific value. This emits high heat with low greenhouse gases emission. Therefore it is highly preferred by the drier manufacturing industry overall against all markets as this cocoa pods can efficiently be used as a fuel as an alternative to electricity and thereby generating revenue for the farmers as well with the waste which they were dumping in their yards for years together as manure. Completely dried and dehydrated pods can be used directly as fuel for the traditional boilers. Burning of pods generate low greenhouse gas emission. This ensures that the firm is eco-friendly and also achieves higher employee satisfaction. Through husk gasification process, cocoa pods can be thermally converted to producer gas. This can be directly used as fuel. This project can be managed by collecting the cocoa waste in the required quantities as expected from buyers either in regular quantities every month or specific quantity every quarter. The buyers also expect the cocoa waste to be dried minimum for a year. Transport facilities will be taken care by the buyer side. An alternative plan to this is the growers and farmers forming an association and buying a dryer machine by themselves to perform the drying activities for the cocoa waste as well as cocoa bean produced in their village itself. There is much bigger market to get this dried cocoa waste rather than the former plan. The starting price of the dryer machine comes up to Rs.1,20,000 for processing 50kgs of cocoa waste in a single cycle. This way, they can also rent the machine for the same purpose. The maintenance cost for such a machine will not be more than Rs.25,000 (assuming 20% of the initial cost). The metrics to be monitored are the returns or profits from the dried waste, whether it is more beneficial that just dumping it as manure, quantity of how

much waste can be dried from the whole of the village, the market for such a product. The deviations might occur in the stage where the manure becomes less as whole of the waste is taken for processing and thereby affecting yield or quality. If found so, they can differentiate ratios on the quantity to be dumped in manure and the quantity to be processed for drying thereby yield and quality also doesn't get disturbed.

Chocolate production unit : The plan deals with setting up of a chocolate production unit in Kumbariyur. It concentrates on converting chocolate bars to chocolate by adding ingredients such as cashew, almonds etc. The chocolate production unit constitutes five machines which are melting machine, compound mixer, designing machine, filling machine and a cooling machine. Identifying the basic requirements for the produce such as land an machinery are major task. The outline cost approximately could be as given below, the cost of construction of the building is estimated a rupees 10 lakhs. The five machines together cost around 60 lakhs with their individual prices given below. Melting Machine Rs9 lakhs, Compound Mixer Rs25lakhs, Designing Machine Rs12 lakhs, Filling Machine Rs8lakhs,Cooling machine Rs6lakhs.The five machines together have a yearly production capacity of 310 tones. The production capacity utilization is estimated at 85 percentage which give a yearly output of 263,5 tones. The selling price of one kg of processed chocolate sands at an average of 650 rupees. Reducing all the input costs, labor costs and miscellaneous costs the average profit is expected to be around 128 rupees per kg pf chocolate produced. The establishment of this chocolate factory brings employment to around 20 families with 35-40 employees working in the production unit. Manufacturing methodologies involved in chocolate processing unit is also considered.

Problems encountered in the village

When there was proper rainfall 4 years back, the total production of Cocoa in Kumbariyur was 28 tons. Last year due to low rainfall i.e, in 2017-2018 was only 13 tons. Providing bore facility to them is efficient because water is available from just 150-300 feet below ground level. The other concern is the type of manure and the impact of "Panjakavya" on the farm produce. The other major concern is that farmers do not plant the saplings given by organiations are not fully planted and the intent towards growing hybrid varieties . Every farmer had problem with labors because labor cost is being very high, for men Rs.550-650 and Rs.250-300 for women per day for labors. Every farmer is pretty sure that this problem is being encountered in large scale only after the 100 day work scheme by Government. Fermentation of Cocoa beans is essential to remove the mucilaginous pulp, to develop flavour and aroma precursors, reduce bitterness, kill the germ of the seed and to loosen the testa. The yeasts convert the sugar in the pulp surrounding the beans to ethanol. Ethanol produced is drained away to ground. The bison problem has been encountered in the village only in the past 8-10 years. The villagers also complain about the bison pushing down the fences even if laid.

The intent with which the above case is given is to keep the village kumbaraiyur as one of the best cocoa providing places. The importance and various options for economic sustainability of the farmers and locals depend a lot on the agricultural produce. Hence a couple of ways have already been given in the case as to how to increase the yield and varieties. It could be more effective if it also seen how its produce can reach various markets as this could be the

most effective way to better the livelihood of farmers and locals. A marketing plan for various agricultural produces and chocolate could be thought about and also to bring about the chocolate factory could be of a great development product.