The Chaplon Project

# EWB-DK

# Concept Note

# Developing a solar powered tea drier and a moisture meter for production of white tea in Sri Lanka

# Partnership between EWB-DK, Chaplon and SOFA

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# The Chaplon Project

1. **Introduction:**

Internationally Ceylon tea is a brand well known by all tea drinkers. Behind the tea production lays an area of poverty among the workers on tea plantations. The price of tea is set by the Sri Lanka government. Sri Lanka tea production is on its way to a serious crisis because both China and Vietnam produces black tea much cheaper than Sri Lanka. The costs of living in Sri Lanka have risen since the end of the civil war between government forces and the Tamil Tigers. The Tamils originally came from mainland India but under the British colonial rule they came to Sri Lanka to work in the tea plantations. They are a minority at the bottom of society working for less than 200 rupees a day. It corresponds to 9 DKr per day. No one can live on that to day in Sri Lanka.

**Chaplon** is a commercial company established and owned by Jais Lauritsen, who together with partners run the firm and employ a staff of 80 persons in Denmark and Sri Lanka. The company started as a webshop in 2003. In 2008 the first plantation was bought on Sri Lanka in the UVA district. Since then more plantations have come to in Passara (2009), Nuwara Eliya (2012) and Ella (2013). Apart from the plantations there is a packing unit in Hikkaduwa. It was established in 2012. As a new enterprise Chaplon wants to produce white tea. Normally white tea is sun dried, but the humid and rainy climate in the highland on Sri Lanka makes it difficult. For that reason Chaplon wants to assist in developing a solar powered sun drier for the white tea production.

**Small Organic Farmers Association (SOFA)** is the name of the local partner in the project. It is an umbrella organization. Mr. Bernard Ranaweera is president of the organization. There are more than 2000 members of the organization. The members mainly produce black and green tea as well as a variety of spices. SOFA is registered as a fair trade organization. The members are organic and biodynamic certified producers.

Chaplon tea has plantations on Sri Lanka and they are cooperating with Small Organic Farmers Association (SOFA) to introduce the production of white tea to the members of SOFA. They have identified a new variety to Sri Lanka, Red Silver Tips no. 1259. It is a more tough plant than the tea they are growing today, and it is very well suited for white tea production. The benefit of producing white tea is a price 20 times the price of black tea and the possibility to process the tea on the farm or at the test center Chaplon tea is establishing. That way the farmers are not obliged to sell their tea at a price set by the government. The policy of Chaplon tea is to improve the economy for the small farmers and create a basis for both tea peasants and tea pickers to improve the living standards. At the same time they want to spread the knowledge of how to grow high quality tea in Sri Lanka. On their own land they grow tea without the use of fertilizer and pesticides. They also grow trees in an agroforestry way to protect the plants from heat and the soils from erosion.

Both Chaplon and SOFA are partners with EWB-DK in this project.

1. **Problem analysis:**

White tea is processed in a different way from black and green tea. It is dried at a low temperature of between 40 and 50 degree Celsius. It has to be dried as fast as possible after the picking so secure that no oxidation of the leaves takes place.

The daily running of Chaplon is located in Bentota. The testcenter in Ella is too far away from the small tea producers organized in SOFA. For that reason Chaplon is in the process of buying a closed tea factory in the area where SOFA members are producing, that is the area around Badulla. Chaplon distribute the new plants at a minimum price to the farmers when they are replacing old tea plants. To day Chaplon buys their way into other tea factories. The coming test center will be a sub production beside the production of black and green tea.

Chaplon has asked EWB-DK to assist them in developing a tea drier based on solar power and built of cheap material available on Sri Lanka. They ask for the construction of two types. One to dry on a big scale on the testcenter to be developed and the other for the individual small scale farmer. At the same time they ask for assistance to develop a method of measuring the humidity of the tea leaves, a moisture meter. At the picking the humidity is around 40% and the tea leaves should dry until only 3-4% of humidity is left.

EWB-DK has also been asked to demonstrate the use of the tea drier and train selected farmers from SOFA in the construction, use and maintenance of it.

1. **Project description:**

**Overall objective:** To improve the standard of living among small scale tea farmers and farm workers on tea plantations in Sri Lanka.

**Immidiate objectives:**

* To develop a large scale and a small scale solar powered tea drier for the processing of white tea.
* To develop a moisture meter for measuring the humidity in white tea leaves
* In SOFA a minimum of 10 persons are involved in the building of one larger and a number of smaller tea driers and 3-5 small scale driers are functioning among the members of SOFA
* Transfer of knowledge from Chaplon to SOFA takes place in the form of practical training in the project as well as development and transfer of guidelines.
* The farmers in the area invest in the growing of white tea and practice drying of the tea leaves with the new method
* Both the members of SOFA and Chaplon improve their income
* Improving good agricultural practice of small scale tea producers
* Improving working conditions among workers on tea plantations

There are 3 distinct areas to be addressed by the project:

1. **Developing a tea drier for white tea production**

The obvious is to use air for drying. The important thing is that the temperature is not too high. It should be possible to control it inside a temperature range of 40 – 55 degree celcius. The process of drying should be so fast the leaves don´t oxidize and/or degrade spontanesly. The drying should commence no later than 48 hours after the picking of the tealeaves. That way the taste and colour of the leaves will not be affected. Temperature and time for drying the leaves are factors that should be experimented with to secure the optimal taste and colour of the end product.

Ideally the tea drier should be developed in two sizes, one on a small scale for the individual farmer or peasant with only a limited harvest of less than 100 kg/week. The other tea drier should be on a large scale as a tea drier for those farmers that don´t want to have their own drier and of the same scale for Chaplon on their tea factory. Whether it should be the same or two different methods are up to discussion and the group will have to decide what will be the best solution.

The pilot plant on the Chaplon estate shall be able to handle tea from Chaplons plantation and from 2000 small-scale producers. The estimate is that there will be 400 kg/day of raw tealeaves in the upstart face. If all producers that are members of SOFA change their production to white tea and wish to have their tea dried centrally, the plant should be able to handle 80.000 fresh tealeaves in 5 years time.

The technology should be simple in a way easy to repair and maintain and the material should be cheap and easy accessible on Sri Lanka

The tea drier will be developed by a team from EWB-DK. They will consult with members of SOFA and Chaplon during the process in Denmark and work together with SOFA members in Sri Lanka

1. **Instrument for measuring humidity, a moisture meter**

It is of the utmost importance that the water content in the processed tea can be measured to avoid that tealeaves with to high water content are being packed. For that reason there is a need for a simple way of measuring and controlling the water content of the leaves to be able to know when the tea is sufficiently dried. Tea ready for export have to follow government rules that say demand a maximum of water content of 3-4%

The technology should be simple using material available in Sri Lanka at a modest price. The method shall be of a nature to be used by local small-scale farmers.

The same group who develop the tea drier will also work with the moisture meter and use the same model for cooperation with SOFA and Chaplon.

1. **Training and technology transfer**

**SOFA** form a group of minimum 10 persons who together with the IUG group from the start of the project in Sri Lanka work together to build the small as well as the large tea drier on the Chaplon testcenter. 3-5 small pilot tea driers are constructed for testing by SOFA to be able to test the drying process, the technical and the economic sustainability. A simple manual is developed for the construction of both the small and the large tea dryer. The manual should also give directions on how to maintain and use the instrument for measuring humidity. The budget for both will be part of the manual. The manual is produced in English and in a number decided by SOFA. It should be understandable for leaders and trainees and the sharing of knowledge should be implemented by SOFA.

To assist the technicians in implementing and securing the transfer of knowledge and technology EWB-DK has a second team. Two members of that team are doing their final thesis working in Sri Lanka on different aspects of trade and technology transfer as well as the question of ownership to technology.

1. **Methodology i**n the project:

The intension for the project is to develop it through 10 stages or phases. The first one is to develop a solar powered tea dryer and the last one is the hand over of the technology to the small-scale farmers organized in SOFA. At the same time as phase 1 and 2 take place in Denmark the intension is for a fact finding mission of 2 weeks duration should take place in Sri Lanka. It is to get a closer idea about the climatic, environmental, social and economic conditions and to have meetings with the Chaplon staff on location as well as with representatives from SOFA. There will be a follow up mission on the cooperation with SOFA at the end of 20015. Again in 2016 there will be two missions to Sri Lanka, the last one is the final mission.

The 10 phases are:

* 1. Fact finding mission and follow up missions to Sri Lanka
* 2. Development of a solarpowered teadrier and a moisture meter in Denmark (EWB-DK)
* 3. Construction of a prototype and test of small drier in Denmark (EWB-DK)
* 4. Exchange between EWB, Chaplon and SOFA in relation to test of small tea drier
* 5. Construction of small tea drier in Sri Lanka at the Chaplon testcenter (EWB together with members of SOFA and representatives from Chaplon)
* 6. Construction and test in Sri Lanka of large tea drier at Chaplon testcenter EWB together with members of SOFA and representatives from Chaplon)
* 7. Construction of 3-5 small pilot tea driers at SOFA headquater (EWB and group from SOFA)
* 8. Conclusion and adjustment based on test of the small tea driers and the large drier.
* 9. Development of a manual for construction of a tea drier, maintenance, budget and economy for the use of drier and moisture meter. (EWB together with SOFA group and representatives from Chaplon)
* 10. Adjustment and multiplication of manual and knowledge sharing in SOFA

Apart from the fact finding mission at the start of the project there will be a follow up at the end of the first year to evaluate the cooperation with SOFA. In the second year there will be a further follow up and a mission at the end of the project.

1. **Timeline:**

**2015**

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| Act. | Jan | Feb. | March | April | May | June | July | Aug | Sept | Oct. | Nov | Dec |
| 1. |  |  |  | X |  |  |  |  |  |  | x |  |
| 2 | X | x | x | X | X | X |  |  |  |  |  |  |
| 3 |  |  |  | X | X | X | X | X | x |  |  |  |
| 4 |  |  |  | X | X | X | X | X | x |  |  |  |
| 5 |  |  |  |  |  |  |  |  |  | x | x | X |
| 6. |  |  |  |  |  |  |  |  |  | X | X | X |

**2016**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Act. | Jan | Feb | March | April | May | June | July | Aug | Sept | Oct | Nov | Dec |
| 1. |  |  |  | X |  |  |  |  |  |  |  | X |
| 7 | X | x | x |  |  |  |  |  |  |  |  |  |
| 8 |  |  |  | X | X | x |  |  |  |  |  |  |
| 9 |  |  |  |  |  | X | X | X | X | X | x |  |
| 10 |  |  |  |  |  |  |  |  |  |  | x | X |

1. **Benefits/results**:

The indicators for the success of the project are on one hand the technology developed by the project. On the other hand there are social, environmental and economic benefits:

* Establishment of a tea drier based on solar power and constructed of cheap locally available material on Sri Lanka. Two types of tea driers are developed a large one for the test center and a small one for the individual small-scale farmer
* A moisture meter that in a simple manner can measure the humidity in the tea leaves
* In SOFA a minimum of 10 persons are involved in the construction of a small and a large tea drier and 3-5 small driers functioning among the members
* Knowledge transfer from Chaplon to SOFA takes place in the form of training in the the project, development of transfer ogf guidelines
* The small-scale farmers in the area invest in growing and production of white tea and practice drying with th use of the new technologies
* Both members of SOFA and Chaplon increase their incom