

Case Study of Collective Tea Farming in Small Fields of a Mountainous Area

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Introduction

After expanding steadily, the Korean green tea industry faced a crisis in 2007. As the tea consumption fell sharply, the accumulated inventories were reported to reach 900 tons in 2006. At the same time, media raised the issue of food safety regarding tea products. Making it even worse for tea farms from mountainous area of Hwagae most of which are small and individually farmed, large distributors were concerned about the quality and safety of tea leaves from small farms and hesitant to buy tea from them. Tea farmers started seeking alternative crops that would secure reasonable income.

For the growth of local tea industry, Dongcheon, an agricultural corporation, started persuading related parties to participate its plan to establish a sustainable, eco-friendly, organic farming in the local area. The company, firstly, explained to small-field tea farms how beneficial and suitable the farming system is to them, whilst suggesting to distributors ways to overcome safety and quality problems which could rise when tea leaves come from various farms. A core idea is to induce the farms to form a "Pumasi" co-op to pool labor force, monitor each other's farming practice and bargain and negotiate collectively with other parties. Dongcheon, Co. also asked relevant local governments to provide farms with financial and IT supports for promotion of tea sales. A public sponsored research institute willingly offered various testing and research services which increased reliability of tea products. Dongcheon itself also invested in the quality management system and has acquired ISO9001 certification on quality management systems. When combined together, all of these roles played by each player led to a revival of the tea economy in Hwagae area.

This research introduces a case study of local farming system where various players participate sustainable, eco-friendly and organic farming with their own contributions as an experimental way to make local tea business profitable and sustainable. This study largely covers disadvantages of small farming fields in mountainous area and suggests how sustainable, eco-friendly and organic farming helps with them, what roles various parties can and should play and eventually how all of these combined efforts guaranteed a future sustainable growth to small farms and their community.

Current status and problems of small fields in mountainous areas

Hwagae is situated in a mountainous area facing the south along the ridges of Jirisan at the altitude of 220m and with the slope of 10-40%. Thanks to its superb landscape and clean environment, the local area is experiencing a large inflow of people from other regions and therefore the regional economy is vibrant. As the demand for green tea has grown gradually since late 1995, tea farms in Hwagae area picked seeds from

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wild tea trees and sowed them to expand tea fields. As of 2006, there were 1,757 tea farms in Hadong-gun with the aggregate tea field of 850ha. The average size per farm was fairly small and stood at 0.48ha. The fields comprise mostly coarse grained soil which contains a large amount of slightly acidic gravels which are not ideal for cultivation in general but suitable for tea growing.

With the observations above being in mind, this study points out some problems of small tea farms in Hwagae area as follow. First, tea farms face longer labor hours per land unit and hence higher production costs as the field area per farm is small and the slope is steep (1). Second, tea trees of the seedling farms have different genetic characteristics and budding seasons, making machine-harvesting difficult. Furthermore, applicable methods of controlling damage by blight and cold weathers are limited, and therefore the production per land unit is low (2). Third, tea farms suffer from low labor quality and high labor costs as they have to heavily depend on family members due to the shortage of labor specialised in tea farming. Fourth, small farms are expected to be poor at maintaining product quality and believed to be vulnerable to contaminations as tea production tends to be carried out manually due to lack of proper facilities and the production skills vary substantially from farm to farm. Fifth, many small farms find it difficult to overcome many problems related to eco-friendly farming due to a limit in the access to the relevant information and lack of passion about it. The next section discusses practices carried out in Hwagae to overcome those problems mentioned above.

Solutions and activities

1. Pumasi co-op, the group of tea farms: In 2007, green tea inventories were rising, sales were in a slump, and the outlook for green tea farms was dark. Dongcheon Co. was relying on tea farms for the supply of fresh tea leaves and thus had incentives to boost the morale of tea farms as well as to suggest future development directions. Accordingly, the firm invited representatives of the nearby 88 tea farms in December, the farmers' least busy season, for discussions. As the background of the discussion, Dongcheon argued that a move to more competitive tea producing region or other occupation would mean a significant time and money investment and has its own problems and that improving the status quo would be a better solution even though revenues from tea sales were dropping. The proposed theme was how to utilize the natural advantages that Jirisan and the stream called Hwagaedongcheon offer. A way suggested was sustainable, eco-friendly organic tea farming. The problems raised were a shortage of labor and damaged food safety caused by a secret use of pesticides and chemical fertilizers by some farms. As a solution, the creation of a pumasi co-op that unites the tea farms of a farming district into a group was suggested. Agreement was reached that pumasi co-ops could relieve labor shortages as the co-op members would cooperate for labor-intensive work such as tea leaf plucking. The farming groups could also contribute to ensuring the quality and food safety of green tea as fresh leaf sales contracts would be signed at the co-op level and thus the accountability would be shared by all co-op members. The member farms would encourage each other to strive to enhance the quality and food safety of their green tea, and would cooperate to improve their farming practices.

As a result of the pumasi co-op movement, the green tea farming in Hwagae developed into a transitional state towards organic farming in 2010. As certified organic farming groups, the 37 members of the Jeonggeum pumasi co-op is producing green tea leaves and other two organic crops in 287 fields with the aggregate area of

47.3ha (469,176 m²) and the 32 members of the Unsu pumasi co-op are cultivating green tea leaves and one other organic crop in 208 fields with the aggregate are of 26.58ha (263,548 m²). Their ambition is to turn the entire cultivation area into eco-friendly farming lands. In the early phases of the transition to organic farming, the farmers' awareness of eco-friendliness was low and some members sprayed pesticides upon red pepper fields and persimmon trees between tea farms on two occasions. The green tea leaves from the contaminated area were all discarded. These incidences offered good opportunities for the co-op members to fully understand organic farming.

2. Sustainable eco-friendly farming reducing entropy: While it is true that irrigation, fertilization, and damage prevention is difficult and that labor consumption is high at a tea farm with a rapid slope, the rapid slope is also a favourable factor for the flavor and substances of green tea because the slope offers more sunlight and longer daylight time, facilitates the airing and drainage, and creates an air current between the valley and the mountain ridge that helps prevent damage by blight and harmful insects (3). This observation stresses the need to choose sustainable farming practices that adapt to what Mother Nature offers and suppress the increase in entropy.

'Entropy' is the motto of the pumasi co-ops. It implies the groups' pursuit of long-term profit, balance between economic gain and safety, dissemination of environmentalism, and reduction of pollution (entropy) caused by farming. In thermodynamics, entropy is a measure of the amount of energy that cannot be used to do work. Soil can be seen as the compression of materials that flow along the entropy cycle and the organic matters and minerals in soil help plants and trees to grow.

3. Strengths of traditional tea trees: Asymbiotic seed germination is suitable to organic green tea farming in mountain fields as the saplings are easily reproduced, highly adaptable to weather conditions, and live long. The fact that various different types of seeds are mixed is more beneficial than single-variety leaf segment in terms of the effectiveness of green tea as the different varieties complement each other. According to Sin (4), Hadong green tea is rich in useful substances, effective in improving physiological functions, and has a good flavor and quality as the ratio of total nitrogen to tannin content and the ratio of theanine content to free amino acid are high. The content of geraniol, a chemical compound that has a rose-like odor is 5.47-11.20% which is higher than 5.2% of Chinese long-jing tea.

4. Quality management system boosting competitiveness: An individual farm would find it burdensome to keep production facilities which can reduce a labor use and help maintaining quality. Competitiveness can be enhanced if farmers produce leaves and specialized companies produce tea. Dongcheon Co. has improved and expanded its facilities for labor reduction and quality maintenance. Some examples are here. A large silo for storage of processed tea has reduced potential hazards between processes, kept constant tea quality, and shortened the production processes. A truck scale offered by the Hadong-gun Office facilitates the packaging and transportation of tea, keeps the high quality of tea and streamlines tea sales.

In order to increase sales of the green tea products made in close and consistent cooperation between tea farms and tea firms, communications between the cooperative parties should run smoothly. Dongcheon has acquired the ISO9001 certification on quality management systems. The company sets its production target jointly with its partner farms and distribution companies. Dongcheon makes contracts

with the farms to purchase a certain amount of tea leaves set based on on-site estimation of the yield, and collects tea leaf samples and ask the Institute of Hadong Green Tea to test their safety. The tea farms partnered with Dongcheon keep journals of organic tea farming which record activities for soil maintenance, composting, weed removal and disease prevention, and register their delivery of fresh tea leaves to Dongcheon upon the latter's reception using their certification cards. Dongcheon created guidelines on required quality, safety inspection and other relevant issues of tea products. The company also demands the partner pumasi co-ops to share the accountability regarding the reserved tea leaf sales.

5. How cooperative local participants are: As tea farms join eco-friendly farming within a pumasi co-op, their cooperation and mutual encouragement play an autonomous monitoring role and became security device regarding the quality and safety. Dongcheon Co. invests in the facilities and leads to reduction in labor demand and manage by clear rule. The Institute of Hadong Green Tea performs pre- and post-production safety tests so that it successfully removes hazardous factors. Moreover, the Hadong Green Tea History Tracking System developed by the Hadong-gun Office allows anybody to track the production history of a green tea product, demonstrating the superb reliability of green tea produced in Hadong. Consequently, the sales of Hadong green tea have revived, and the annual tea leaf sales steadily increased from 140 tons in 2008 to 595 tons in 2009 and again to 614 tons in 2010.

Conclusions

When it comes to consumers' green tea purchase decision, product safety, quality, and reliability are important considerations. The model suggested by this study is a system where all the stakeholders including consumers, producers, distributors, and certification entities participate, develop self-imposed regulations on product quality, safety, and distribution, and faithfully conform to the voluntary regulations. The model that has entered its fourth year is a small-scale system in which a tea farm established spontaneously over long time is the basic unit. While the green tea crisis incentivized this study to be conducted, the author would like to thank tea farms for their enthusiasm to learn about organic farming and faithful participation in this study, institutions that provided timely supports, and customers who trust Dongcheon.

References

1. Park, Y. G. (2007): The outlook for the Korean green tea industry. Korean Academy of Science and Technology, pp. 11-32.
2. No, I. S. (2006): Presentation on green tea-related excellent technology. Ministry for Food, Agriculture, Forestry and Fisheries, pp.40-53.
3. Kim, J. C. (2010): The 2009 analysis of Hadong green tea farming area by meteorological factors. 2010 Spring Seminar of the Korean Tea Society, pp. 71-89.
4. Sin, M.G. (2003) A study on the excellence of Hadong green tea, pp. 90-123.