

CHAPTER 6

COMPARATIVE ANALYSIS OF CONVENTIONAL AND ORGANIC TEA PRODUCTION SYSTEMS' PROPERTIES

The chapter focuses on analyzing the properties of each system in order to explore the development possibilities in the future. Theoretically, system is defined as real thing having a boundary, hierarchy levels, with specific properties such as stability, productivity, and sustainability. These properties are measured in quantity and qualitative indicators. Thanks to comparing them, differences between two systems in terms of properties would be expressed. Likewise, to distinguish between these systems allows developing them efficiently in the selected study sites. The chapter includes the comparison and analysis of these properties. Finally, study on some factors affecting a conversion process was presented.

6.1 Compare system properties

Conway (1985) suggested that four system's properties should be used to understand the dynamics of an agro-ecosystem. They are productivity, stability, sustainability, and equitability. These may be used as neutral descriptors of system behavior for understanding, or they may be used as indicators of performance (co-objectives). In the latter case a value judgment is made, and humans determine which of the performance indicators are most important to the human community.

6.1.1 Productivity

Productivity is the quantity of product or output from an agroecosystem per unit of some specified input. For an agroecologist, output may include a marketable product such as bushels of corn. Commonly, a ton per hectare is a standard measure of productivity. But productivity can also be expressed in other units of output per unit of input. Inputs may be measured in tons of fertilizer, monetary value of pesticide, even the production relationships might be expressed as tons of grain produced per unit of soil loss due to erosion. While this may have little short-term

economic significance, it can be used to help us better understand the dynamics of the agroecosystem.

As comparison of productivity, one of major properties of each system, between conventional tea system and organic tea system, the yield, gross margin and net margin of tea production in study sites was considered to study. Table 37 summarized the comparison.

Table 37 Productivity and gross margin by conventional and organic tea system

| | Conventional | Organic |
|--------------------------|--------------|---------|
| Yield | (M) | (L) |
| Yield of tea/farm (kg) | 611 | 514 |
| Yield of tea/ha (kg) | 5009.2 | 4208.4 |
| Gross margin (mill. VND) | 3.3 | 4.5 |
| Net margin (mill. VND) | 2.2 | 3.4 |
| <i>Aggregate</i> | M | H |

Source: survey, 2002.

Note: in parenthesis presented the assessment of tea growers.

The results showed that yield of organic tea was less than one of conventional tea, but obtained high price, so its net margin was higher than one in conventional system. The aggregate index indicated that conventional had lower productivity than organic system. Value of indicators in quantity and quality are all reflected the conclusion, next another system's property, stability, was considered.

6.1.2 Stability

Stability is consistency of production in spite of short term upsetting influences such as uneven rainfall, pest explosions, price variability, etc. Annual variations in productivity indicate a lack of stability. The criteria used to assess the

stability of the systems were the yield of fresh tea, prices and gross margin through the coefficient of variation suggested by FAO (1997). The stability of the systems assessed by three criteria was shown in Table 38.

Table 38 Comparison of stability property by systems and criteria using CV(%)

| Criteria | Conventional | Organic |
|--------------------|--------------|---------|
| Yield of fresh tea | 15.5 | 35.2 |
| Price of | | |
| Fresh tea | 3.7 | 4.8 |
| Processed tea | 5.6 | 10.4 |
| Gross margin | 4.3 | 10.5 |

Source: calculation from STATISTIX, 2002.

The results revealed that yield of fresh tea in conventional tea system was more stable than one in organic tea system; furthermore, coefficient of variation (CV) of conventional was 15.46 % less than one of organic system (35.16 %). This was explained that in the beginning period, due to certified organic farms coped with more risk than conventional farms, in particular, pest and disease. The result was illustrated that price's and gross margin' s CV of surveyed organic tea farms were higher than these of surveyed conventional tea farms. It was concluded that organic tea production system was less stable than conventional tea production system in selected study sites. This was a result of new-established organic markets and as so –called niche markets; therefore price was hardly stable in long term. In particular, organic tea farmers have, currently, sold the processed tea at differentiate prices providing of market and consumers. In addition, the price of processed tea affected the gross margin; therefore, it led to gross margin of organic system was extremely instable.

6.1.3 Sustainability

Sustainability is the ability to maintain a desired level of production over time, in spite of long term destabilizing influences. Systems that rely on heavy inputs of non-renewable and rapidly diminishing resources are not considered to be sustainable.

In the study, criteria, which were referred, were economic, social, and environment protection criteria. Benchmark or quantified criteria were employed. Index levels were quantified via High (H) = 3, Medium (M) = 2, Low (L) =1, used to assess the sustainability of the systems throughout 1997 -2001. Questionnaire form also supported for the study approach. Assessment opinions were from tea farmers in both systems. Data series of five- year-period was considered for both systems. Number of respondent showed $N_1 = 56$ for conventional and $N_2 = 54$ for organic. Results of assessment of each system were summarized in Table 39.

Table 39 Assessment of tea production systems by criteria

| Indices | Conventional | Organic |
|--|--------------|---------|
| Maintain soil fertility | M | H |
| Protect water, air, not contaminated from production | M | H |
| Productivity | H | L |
| External input use | H | L |
| Good for tea growers' health | L | H |
| Generating employments | M | H |
| Raising income | M | H |
| <i>Aggregate</i> | M | H |

Source: survey, 2002

As shown in Table 39, most criteria related to environment and health was highly appreciated by tea growers for organic tea system, in contrast, productivity of fresh tea of organic system was evaluated not as much as conventional tea production system's yield.

Table 40 Index for sustainability: conventional versus organic system.

| | Conventional tea system | | | | | Organic tea system | | | | |
|------------------------|-------------------------|-----|-----|------|------|--------------------|-----|-----|------|------|
| | 97 | 98 | 99 | 2000 | 2001 | 97 | 98 | 99 | 2000 | 2001 |
| <i>Economic</i> | | | | | | | | | | |
| Productivity | 2.4 | 2.3 | 2.4 | 2.4 | 2.4 | 1.3 | 1.3 | 2.0 | 1.8 | 2.1 |
| Gross margin | 1.7 | 2.0 | 2.3 | 2.2 | 2.3 | 1.3 | 1.4 | 2.3 | 1.9 | 2.4 |
| <i>Environment</i> | | | | | | | | | | |
| Protect air, water | 1.5 | 1.9 | 2.2 | 1.7 | 1.5 | 1.3 | 1.3 | 2.3 | 1.8 | 2.3 |
| Good for health | 1.9 | 2.0 | 1.8 | 1.4 | 1.2 | 1.9 | 2.0 | 2.0 | 2.2 | 2.1 |
| Maintain soil | 1.6 | 1.3 | 1.3 | 1.0 | 1.0 | 2.2 | 2.3 | 2.3 | 2.3 | 2.5 |
| <i>Social</i> | | | | | | | | | | |
| Generate employment | 2.2 | 2.3 | 1.9 | 1.7 | 1.7 | 2.2 | 2.3 | 2.3 | 2.2 | 2.4 |
| Raise income | 2.0 | 2.1 | 2.0 | 1.5 | 1.8 | 2.0 | 2.1 | 2.0 | 2.0 | 2.3 |

Source: survey and calculation, 2002.

Note: Number in Table = score range 1-3, in which, 1=low, 2 = medium, 3=high

As shown in Table 40, organic tea system was sounded better possibility of maintaining the 'continue' than conventional system. It was clear that in beginning period 1997 and 1998, some indices of organic tea system were lower, but in the late period, these indices were rapidly improved.

6.2 Assessment of factors affecting the conversion process

Conventional tea farm may be converted into organic farm by applying organic farming practices. New alternative raised income and contribute into preserving the environment. However, there were some factors influencing on the converting process. These were reported by the sampled conventional tea growers and were listed in Table 41.

Table 41 Factors affecting the conversion process

| Criteria | % of respondents |
|---------------------------------------|------------------|
| No market | 69.6 |
| Low price | 64.3 |
| Hardly operate farm | 87.5 |
| No fund, credit source | 39.3 |
| No training course | 33.9 |
| No support programs | 64.3 |
| Hardly get certified | 69.6 |
| Not know how much cost for transition | 78.5 |

Source: survey, 2002

The result indicated that some factors had a decided significance for tea growers when they like to convert their tea plantations into organic tea. These were market factors (69.6 % of the sampled conventional tea farmers) and current prices of processed tea (64.3 % of the sampled conventional tea farmers), other factor as tea grower supposed that it was hard to get organic certification for their products even from health care organization to sell easily their products on the markets (69.6 % of 64.3 % of the sampled conventional tea farmers). Most tea grower reported that it was so difficult to operate organic tea farm currently if organic training courses was limitedly arranged (87.5% respondents' answers for this issue).

The results showed that most conventional tea growers have no known about organic production (21% of conventional farmers answers) since there was no propagation and extension works efficiently. At present, consumers also rarely know about organic products in general and organic tea in particular (only 20% of asked consumers recognized the difference between two kinds of tea). It was realized that it need to have publicity campaigns for advertisement by organizing periodically organic trade fairs with products such as tea, vegetable, and apple and showing on television, in order to attract and make consumers changing their attitude to organic products.

Table 42 Assessment of tea growers and consumers on tea production and products

| | Conv. tea growers (N=56) | Consumers (N=15) |
|---|-----------------------------|---------------------|
| Know about organic tea production (yes = 1, no=0) | 21% | 10% |
| Recognize the difference between conventional and organic tea products in quality (yes = 1, no = 0) | 17% | 20% |
| Distinguished by: | - | 30% |
| Different price | - | 30% |
| Label, logo | - | 40% |
| Advertisements from organic growers | - | |

Source: survey, 2002.

Note: N number of respondents

Most consumers in the sample (40%) realized the difference between organic and conventional tea by advertisement of organic farmers. It also means that they only believed in organic tea growers, besides, they hardly know which was conventional tea or organic tea.

It was realized that perception of tea growers and consumers on organic products had important significance in organic development in the future.