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# **A Study on Entrepreneurial Attitudes of Upcountry Vegetable Farmers in Sri Lanka**

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## **Abstract**

**Purpose** - This study investigates the entrepreneurial attitudes of upcountry vegetable farmers in Sri Lanka with respect to the characteristics of innovation, opportunity-seeking and risk-taking and considers their implications for rural development efforts.

**Design/methodology/approach** - The study was carried-out in the hilly areas of the Badulla district in the Uva province of Sri Lanka. Primary data were collected through a survey using a researcher-administered questionnaire as the data collection instrument and the individual farmer as the unit of analysis.

**Findings** - Most vegetable farmers in the upcountry areas were found to be attitudinally entrepreneurial. Entrepreneurial attitudes were determined more by educational background and farming experience than age, gender, extent of farmland, type of farming and ownership of farmland. Farming experience related positively with innovation, opportunity seeking and risk taking, but farmers' educational background showed no significant association with innovation.

**Practical implications** - It is suggested that farmer-owned companies with appropriate institutional arrangements could reduce transaction costs for buyers, and introduce accessible rural finance schemes to enhance provision of assets and technology. Such a rural setting would gain from initiatives on marketing alternatives and entrepreneurial skill development. Future research could benefit from analysis of the financial and social performance and entrepreneurial skills of vegetable farmers.

**Originality/value** – The entrepreneurial attitude of farmers is an under-researched area of study particularly in the Sri Lanka context. Rural development initiatives could target entrepreneurial farmers based on these criteria to achieve maximum production impact. However care needs to be taken to consider the potential distributive impact of such targeting on farmers regarded as non-entrepreneurial.

**Keywords** - Entrepreneurial attitudes, Vegetable farmers, Rural development, Rural policy, Sri Lanka

**Article Classification** - Research paper

## **1. Introduction**

Agriculture is the principal form of livelihood for a substantial fraction of the population of Sri Lanka. The sector's average contribution to GDP was 10.6% over the last four years

(Table 1) (CBSL, 2008-2012). Sri Lanka exported US\$ 2,528 million worth of agricultural produce in 2011 and recorded overall growth of exports by 36% over the last four years. On average, the agricultural sector provided 32.7% of the total employment of Sri Lanka. Vegetable production contributes four per cent of the GDP of the country. Therefore, vegetable cultivation is an important sub-sector in Sri Lankan agriculture. The Central Bank of Sri Lanka (CBSL) (2011) stressed that actions are needed to enhance the incomes of domestic farmers to ensure continued domestic supply of agricultural produce.

Table 1: Agriculture sector contribution towards GDP, exports and employment

<b>Year</b>	<b>Agriculture as a share of GDP (%)</b>	<b>Agricultural Exports (US \$ millions)</b>	<b>Increment over last year (%)</b>	<b>Employment in agricultural sector (% of total)</b>
<b>2008</b>	12.1	1855	23.1	32.7
<b>2009</b>	12.0	1690	(8.9)	32.6
<b>2010</b>	11.9	2041	20.8	32.7
<b>2011</b>	9.9	2528	9.6	32.9

(Source: Central Bank of Sri Lanka, annual reports 2008 – 2011)

Food is a requirement for everyone. Considering the local food market, there are diverse activities involved in producing foodstuffs and putting them on the retail shelf. In today's economic environment, the agribusiness sector combines diverse commercial enterprises, using a heterogeneous combination of labour, materials, capital and technology. Agribusiness includes three economically interdependent sectors: input supply, farm production (throughput) and the output (marketing) sector. It includes all those business and management activities performed by firms that provide inputs to the farm sector, produce farm products, and process, transport, finance, handle or market farm products. Food supply systems are complicated and change constantly to meet consumer demands and provide food to both domestic and world markets.

The agricultural sector offers a livelihood for a high proportion of people in most developing countries. Land is a limiting factor in many rural areas and improvement of the livelihoods of poor small scale farmers who lack economies of scale is an important issue. Pressure on land constrains the opportunity for poverty reduction through the expansion of farms. There has been a decline in public sector support for agriculture during the past two decades and many producers have lost access to services (OECD, 2006). When public sector provision of these services is not very efficient, market economies, such as Sri Lanka, encourage intermediaries to link poor farmers with markets. This is particularly true for the upcountry vegetable sector, a highland mixed farming system (FAO and World Bank, 2001). Agricultural intensification and sustainable utilization of rural land has become a strategic priority (Dixon et. al., 2001). However, these measures *per se* seem inadequate. Introducing programmes to enhance output, particularly exports, has been a challenge due in part to poor entrepreneurial skills among farmers (Kulatunga, 1993).

This study examines the innovation, opportunity-seeking and risk-taking attitudes of the vegetable farmers in the hilly areas in Sri Lanka and the implications for policies that may support rural development efforts. Literature discussed in the next sections on entrepreneurial

behaviour relates to three important characteristics; innovation, opportunity seeking and risk-taking.

## **2. Entrepreneurial behaviour of farmers**

### ***2.1 Farmers as entrepreneurs***

'Farming' can be defined as the cultivation of soil and rearing of livestock. A farm is regarded as a social entity. McElwee (2006) defined farmers as those who are engaged in farming on a part- or full-time basis to realize their main source of income. Farm management at rural levels is defined as the science and art of optimization of resource use in the farm components of farm-households (McConnell and Dillon, 1997). Farm management also can be explained as a collectivity of management strategies and processes that are used to keep a farm productive and profitable. Management of farms and non-farm entities can be quite similar as both these forms of business employ similar management processes such as planning, organizing, leading and controlling. Large commercial farms are more likely to carry-out more risky operations that involve increased capital investment to achieve higher operational efficiency and increase returns for their owners. In Sri Lanka, those who are occupied in farming for a secondary or a supplementary livelihood are considered as part-time farmers.

Kuratko (2009) defines entrepreneurs as individuals who recognize opportunities in situations where others do not seem to notice anything beneficial. They start companies and create jobs. An entrepreneur searches and responds to changes and exploits them as opportunities (Drucker, 1995). Their businesses, when successful, are characterised by innovative strategic practices and sustainable growth. According to Kuratko (2009), the entrepreneurs' principle objectives are innovation, profitability and growth. He further argues that an entrepreneur is an innovator who identifies and takes opportunities and then converts them into marketable ideas, adds (economic) value, assumes the risks of the competitive marketplace to implement those ideas, and realises rewards at the end.

According to Gray (2002), entrepreneurs are individuals who manage and intentionally expand a business with the leadership and managerial qualities to achieve their goals. Entrepreneurs work for themselves. They take risks, observe possibilities, transform raw materials into goods and services through organising production, and handle the economic activity to obtain rewards (Ramana, 1999).

McElwee (2008) contended that recognition of business opportunities was a key entrepreneurial requirement for British farmers. The importance of both recognising and taking opportunities is also suggested by a number of authors (e.g. Stevenson and Jarillo, 1990; Timmons, 1999; Scott and Venkataraman, 2000, Man, et.al, 2002) while others refer to the importance of innovation (e.g. Kuratko and Hodgetts, 1998; Hisrich and Peters, 1998). Entrepreneurial behaviour characteristics such as opportunity seeking, innovation and risk taking (and their determinants), which are topics of research on business entrepreneurs, can be used to assess the entrepreneurial behaviour of farmers as this paper suggests. Farmer entrepreneurs with these three characteristics are believed to be capable of transforming ordinary agriculture into profitable agribusiness ventures.

Sandika (2009), based on a study of small-scale mushroom growers in Sri Lanka, suggested that innovation and risk-taking are factors that are vital for success. However risk taking can be problematic in a developing country context where farmers' asset bases may be quite small and their capacity to absorb loss may be limited. It is therefore necessary to be careful to contextualize any interpretation of entrepreneurial characteristics to the area and type of farmers under consideration

The underlying assumptions relating to small farmer behaviour have been the subject of considerable debate since Schultz (1964) argued that farmers in developing countries were 'efficient but poor' and exhibited the sort of profit maximizing behaviour that might be regarded as consistent with entrepreneurial characteristics. Lipton (1968) argued that resource poor farmers had to be risk averse because they do not have the capacity to withstand the potential loss from risky activities. Wolf (1966: 2) pointed out that such farmers run households rather than businesses and have a choice between work and leisure. They also have a choice between production of food for consumption and cash crops for income (Low 1986)<sup>1</sup>. It should therefore be recognized that the entrepreneurial behaviour of small farmers may be constrained by the consequences of the risks they face and the needs of their households and such factors may vary between farmers. Intervention strategies therefore need to take account of such variations if they are to benefit all households. McConnell and Dillon's (1997) distinction between farmers who rely predominantly on cash income and may exhibit more entrepreneurial behaviour and farmers who consume a significant part of what they produce is relevant in this respect.

We might therefore expect that the population of farmers in any particular area may include some farmers who exhibit entrepreneurial behaviour and some who do not. Any effective intervention strategy in principle should take account of the needs of both groups and should therefore investigate the factors that cause farmers to exhibit entrepreneurial behaviour.

An issue that has been given increasing attention in the development literature is the nature of rural livelihoods and their sustainability (Scoones, 1998). Rural households are not just farmers and rural livelihoods can involve a combination of different activities that will vary depending on the assets held. Such assets include physical and natural capital as well as human, social and financial capital. Entrepreneurial farmers are likely to be those that have adequate and sustainable assets. The World Development Report of 2008 (p. 84) notes the critical importance of asset endowments for agricultural development strategies. Akram-Lodhi (2008: 1160) argues that "the WDR 2008 suggests that competitive entrepreneurial smallholder farming has some future if it becomes more deeply commercially-oriented.... but that, in terms of poverty reduction, this outcome will be the exception." More recently Collier and Dercon (2014: 99) have argued in relation to smallholder farmers in Sub-Saharan Africa that "development strategies need to shift emphasis and resources away from small farmer (and small trader) models and open up new forms of commercialization." Donovan and Poole (2014) noted significant variation in outcomes for coffee farmers in Nicaragua depending on the initial level of assets with most gains accruing to those with the highest initial level of assets.

It is therefore relevant to consider whether the asset bases of the smallholder farmers in the area under study are sufficient for the maintenance of entrepreneurial behaviour. In the investigation of potential entrepreneurial behaviour it is therefore necessary to take into

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<sup>1</sup> A more comprehensive review of related literature can be found in Ellis (1988).

account access both to land and equipment as well as education, finance and social networks. All of these factors were reflected in the questions used in the survey of the study area.

## ***2.2 The concept of farmer entrepreneurship***

Defining the term entrepreneurship is a challenge since entrepreneurship involves complex human dynamics resulting in a pre-planned business success. It also involves complex human interactions and yields a range of positive end results (Gajanayake and Surangi, 2010). Anjanaswamy (1992) argued that entrepreneurship involves withdrawing from inhibiting value systems and embracing new values relevant to changes in the environment. According to Drucker (1995), entrepreneurship is gathering and allocating resources to address opportunities rather than problems. In his opinion, entrepreneurship ensues when resources are purposefully directed towards progressive opportunities. The key characteristics of entrepreneurship, as identified by Kuratko (2009), are opportunity seeking, taking risks beyond security, tenacity and persistence in pushing an idea through to reality. Thus, entrepreneurship is an integrated concept.

Research with European farmers used the following definition (de Wolf and Schoorlemmer, 2007): “An entrepreneurial farmer is a person who is able to create and develop a profitable business in a changing business environment”. This implies that the farmer should have the attitudes and motivation to win in increasingly hostile business environments. Mass media, farmer friends and associates, and farmer training programmes may supply information to the small-scale farmer about the opportunities available in such hostile environments. However, according to Rahman and Westley (2001), resource-poor farmers have little or no idea about market dynamics. This leads to a situation in which even the potentially entrepreneurial farmer is remote from identifying market opportunities.

Hemachandra and Kodithuwakku (2006) reported that market orientation among resource-limited rural farmers in Sri Lanka was poor. However, linking resource-limited farmers to markets provides new opportunities for them. IFAD (2012) reported that their initiatives for the establishment of such links (to convert farming into a competitive and a fast moving sector in Sri Lanka) have been accepted by some farmers and farmer groups in the vegetable cultivating hilly areas of Sri Lanka. One such initiative is the public-private partnership to bring public institutions, private companies such as popular supermarket chains and farmers together to help the farmers to modernize farming (IFAD, 2012). Further, their livelihood support projects facilitate farmer training programmes and establishment of forward sales contracts for selected farmers. Therefore, there is pressure on farmers to take advantage of their opportunities.

Entrepreneurship as a process is often characterised by innovation, which is the conversion of ideas into uses. Entrepreneurship and innovation are positively related to each other (Zhao, 2005). It is normal for farmers in developing countries to make adjustments when facing changes in their farming circumstances. However, these are not necessarily real entrepreneurial initiatives. Availability of market opportunities and market access are needed to motivate smallholder farmers to adopt innovations (FAO, 2012).

In Europe, acceptance of risk (and failure) is an important characteristic associated with entrepreneurship (Bryden and Hart, 2001; Hisrich and Drnovsek, 2002). However, experience

from many developing countries suggests that resource-poor farmers display risk aversion which may lead to weakened entrepreneurial behaviour (FAO, 2012).

### *2.3 Towards a conceptual model*

Small-scale farmers can be ordinary individual farmers, members of farmer organisations and cooperatives, farmer leaders or farmers who can initiate new farming ventures. Treating farmers as a homogeneous group can be a mistake (McElwee, 2006) and can be problematic for rural development efforts. Poole, Chitundu and Msoni (2013) pointed to significant heterogeneity in the response to commercial opportunities among smallholder cassava growers in Zambia. Donovan and Poole (2014) categorized Nicaraguan coffee farmers on the basis of scale and diversification. They found that small scale diversified farmers gained least from new opportunities accessed through a co-operative that provided marketing, credit and technical assistance. Barrett et al (2011) conducted a meta analysis of contract farming arrangements and concluded that “gains from agrifood value chain transformation accruing to net sellers in the form of higher profits will likely concentrate in the hands of a relatively modest share of the farm population in the developing world” although they admitted that “there is presently scant hard evidence on this important point” (p.727). Given the diversity of context and potential outcomes it is important to be careful about generalising from a specific context and to ensure that the model adopted is appropriate for the area under study.

Farmers may need differential attention (depending on their receptivity) by government officers such as extension officers who offer a range of services towards the farming communities. Farmers are not all receptive to the enterprise development strategies of local and international rural development efforts. This may be because they are intrinsically heterogeneous as far as their attitudes related to entrepreneurial characteristics are concerned. Therefore, these efforts are grasped by different farmers differently. For example, McElwee’s (2008) type II farmer: farmer as entrepreneur, bears the characteristics of diversification-orientation (innovation), openness to strategic alliances and networks (opportunity-seeking) and responsiveness to agro-enterprise development efforts in rural areas. In addition, risk taking is an important requirement to realise business opportunities (McElwee, 2011). Fitzsimmons and Douglas (2005) contend that the entrepreneurial behaviour of an individual is a function of abilities and attitudes. Therefore, entrepreneurial attitudes are indicators of one’s entrepreneurial behaviour and can be used as a tool to measure entrepreneurial behaviour. Key organizations engaged in agricultural development also pay attention to development of rural enterprises (IFAD, 2012). Identification of enterprising (or entrepreneurial) farmers is a cornerstone in these rural development efforts. Therefore, this study seeks to address the question “how entrepreneurial are the upcountry vegetable farmers in Sri Lanka?” To answer this question the study investigated key entrepreneurial characteristics such as innovation, opportunity-seeking and risk-taking.

For the purpose of this paper, farmer entrepreneurial behaviour is defined as behaviour with a mix of innovation, opportunity seeking and risk taking. To help redress the gaps existing in the literature on small scale upcountry vegetable farmers in Sri Lanka, this paper attempts to establish relationships among three key entrepreneurial attitudinal characteristics: innovation, opportunity seeking and risk taking. It assumes that entrepreneurial farmers could help bring about rural development through enterprise success. The results could facilitate approaches to identify enterprising farmers in rural areas. The empowerment of small-scale vegetable farmers in Sri Lanka may be enhanced through economic support and the development of

skills and abilities. Agribusiness and the entrepreneurial activity of these farmers can be promoted by such empowerment. Therefore, although confined to the analysis of entrepreneurial attitudes, this paper suggests that entrepreneurial behaviour is related to farmers' entrepreneurial attitudes in terms of innovation, opportunity seeking and risk taking. This view is captured by the theoretical model (Figure 1) proposed for this study. Farmers falling in to the area denoted by 'A' in Figure 1 are attention-worthy as they possess a blend of attitudes on innovation, opportunity seeking and risk taking that facilitate productivity improvement and income generation.

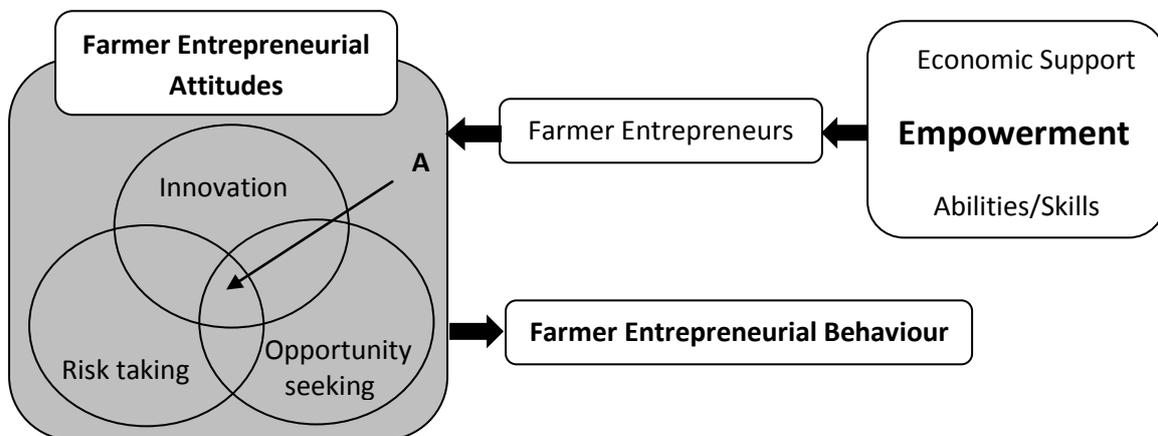


Figure 1: A theoretical model of farmer entrepreneurial attitude characteristics.

### 3. Method and data

This study was set up to measure the entrepreneurial attitudes of vegetable farmers in the hilly areas in Sri Lanka and to analyse the factors contributing to those attitudes. It is also intended to discuss policy implications that may support rural development efforts. Literature discussed in the previous section provided support for aligning key characteristics of innovation, opportunity seeking and risk-taking with the entrepreneurial behaviour of farmers. Farmer entrepreneurs are conceptualised as individuals who are innovative, opportunity-seeking and risk taking.

#### 3.1 Variables and method of the study

Innovation, opportunity seeking and risk-taking were selected in this study as intrinsic variables to measure entrepreneurial attitudes. Four determinants each from innovation and risk taking characteristics and six from the opportunity seeking characteristics were identified (14 in all) to measure the particular characteristics as well as overall farmer entrepreneurial attitudes. The intrinsic variables of farmer entrepreneurial attitudes and their determinants which were considered as explanations for variations in entrepreneurial attitudes and resultant entrepreneurial behavior are put into context in Figure 2 below.

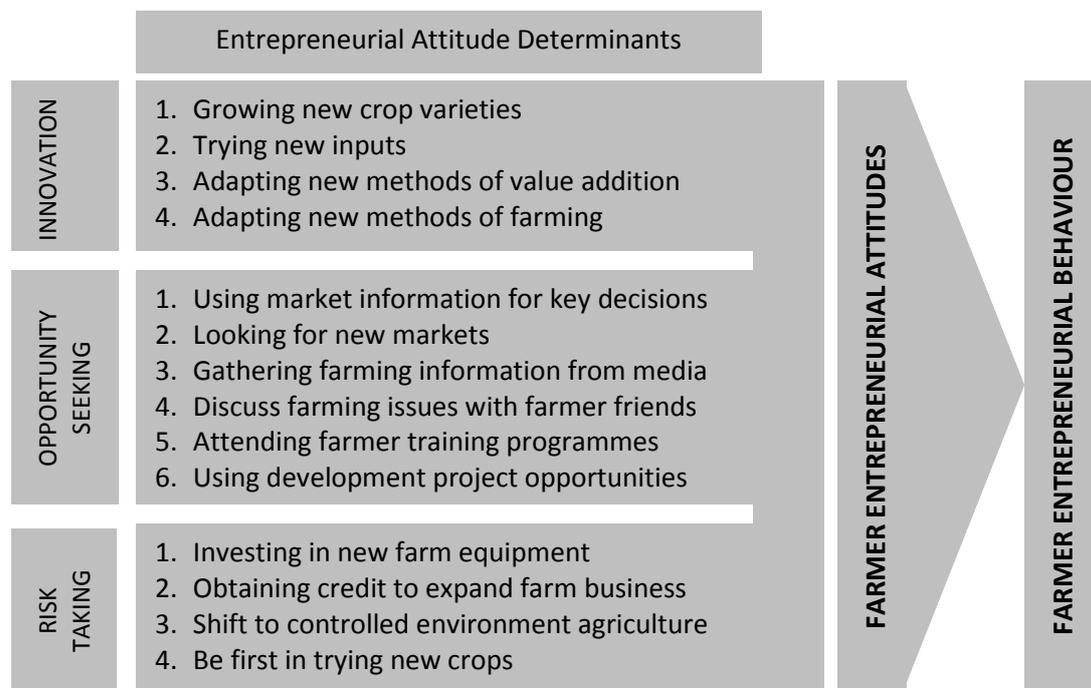


Figure 2: A model of intrinsic determinants of farmer entrepreneurial attitudes.

A large number of potential determinants could be used to define the three entrepreneurial attitude variables under investigation. The determinants selected for this study were simple and farmer-friendly factors identified through preliminary studies in the area. The study used four factors as determinants of innovation. They included the growing of new crop varieties (NWCROP); trying new inputs (INPUTS) such as fertilizer, manure and agrochemicals; adopting new methods of value addition (VALADD) such as retail packaging and vegetable processing activities; and adopting new methods of farming (NWFARM) such as creative intercropping practices, for example vegetables with high value fruit crops.

Six determinants were used to measure the opportunity seeking attitude of farmers. They were using market information for key farming decisions (MKTINF) such as price, varieties, and land area planted in different geographical locations – an indication of supply; looking for new markets (NWMKT) such as new market avenues in different geographical locations and new buyers such as supermarket chains; gathering farming information from media (MEDIA) such as radio, newspapers and television channels; discussion of farming issues with farmer friends (PEERS); attending farmer training programmes (FMTRN); and making use of opportunities made available by development projects (DEVPRO).

Four determinants were used to measure the risk taking attitudes of farmers. They were investing in new farm equipment (EQUIP) such as tractors and power sprayers; obtaining formal or informal credit to expand the farm business (CREDIT); shift to controlled environment agriculture (CONENV) to enable the farmer to engage in year-round production; and to be among the first to try new crops (FIRST) in the locality.

In addition, six other factors which may affect the entrepreneurial attitudes were also selected as variables. They were gender (GENDER), educational background (EDUCATION), experience in farming (EXPERIENCE), extent of farmland (EXTENT), farm record keeping (RECORD) and farm planning (PLAN). Interactions if any, between these factors and farmer

entrepreneurial attitude characteristics were investigated as possible explanations for variations in the entrepreneurial attitudes of vegetable farmers.

### **3.2 The research approach**

Having considered the research objectives and the underlying concepts relating farmer entrepreneurial attitudes to the variables, a quantitative investigation was considered most relevant to understand the entrepreneurial attitudes of the vegetable farmers in the study area. Therefore, this study employed a survey and used a researcher administered questionnaire as the data collection instrument.

The questionnaire was designed to collect socio-economic and farmer factors, and it was pretested in the study area before finalisation. Farmer factors such as gender, record keeping and farm planning were recorded on the basis of dichotomous responses such as male/female and yes/no. Responses for educational background and experience in farming were recorded in predetermined classes while extent of farmland was recorded as numerals in acres. Farmer entrepreneurial attitudes were recorded on a five point Likert scale. These were recorded using the scale from ‘strongly agree’ (1) to ‘strongly disagree’ (5) while a score of 3 was assigned for the response ‘cannot decide’. Accordingly, vegetable farmers were classified into five categories on their average score on entrepreneurial attitude variables as indicated in Table 2. These categories correspond to the answer options on the Likert scale. Average values between points on the Likert scale were taken as the boundaries between entrepreneurial attitude classes (Tables 2 and 9).

Table 2: Vegetable farmer entrepreneurial attitude categories

<b>Mean score on entrepreneurial attitude characteristics</b>	<b>Entrepreneurial attitude classification</b>
1.0 to < 1.5	Highly entrepreneurial
1.5 to < 2.5	Moderately entrepreneurial
2.5 to < 3.5	Doubtful
3.5 to < 4.5	Moderately unentrepreneurial
4.5 to 5.0	Highly unentrepreneurial

### **3.3 Collection of data and analysis**

The study was carried-out in the cooler hilly areas of the Badulla district in Uva province of Sri Lanka. The sample was selected through a multistage process. Uva province was selected as it was a key province that produced upcountry vegetables. Three famous vegetable growing divisional secretariats (DS)<sup>2</sup>, Bandarawela, Haputale and Welimada, were selected with assistance from agrarian services officers. Seventy eight vegetable farmers were selected at random from these areas.

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<sup>2</sup> The ‘districts’, which were sub-divisions of provinces of Sri Lanka, are divided in to administrative sub-units known as ‘divisional secretariats’. These were formerly known as ‘DRO divisions’ after the Divisional Revenue Officers. Later the DROs became Assistant Government Agents and their divisions were known as ‘AGA Divisions’. Currently, these divisions are administered by a ‘Divisional Secretary’, and are known as ‘DS Divisions’.

In addition to the vegetable farmer respondents, village elites, champion farmers and farmer leaders in the locality were selected as key informants. They were used to gather data on aspects that required knowledge on broader socio-economic aspects of the particular areas. When collecting data, care was taken to prevent biased, fabricated or exaggerated answers from farmers that may have affected the quality of data. Participant observations were also used to verify some of the answers from the farmers. Data were collected during the last quarter of 2010 and the individual farmer was taken as the unit of analysis in this study.

Responses collected through the questionnaire were analysed descriptively to determine farmer characteristics and their entrepreneurial attitudes. It was necessary to determine relationships among the variables in order to explain the particular entrepreneurial attitudes of farmers. In order to do this, classification of data into meaningful and homogeneous groups was required. Punj and Stewart (1983) reported that hierarchical cluster analysis can be used as a classification tool in survey research. Knight, Lyne, and Roth (2003) and Rosairo et. al. (2012) used hierarchical cluster analysis to classify survey data to identify the best institutional practices for farmer-owned companies in South Africa and Sri Lanka respectively. An advantage of cluster analysis as an analytical tool is that it makes no prior assumptions about the differences within a population (Punj and Stewart, 1983). Therefore, hierarchical cluster analysis was used to identify discreet yet meaningful categories of variables and not cases. Ward's method was used for this exercise taking Squared Euclidean Distance as the measure of interval. Data were analysed using the software IBM SPSS Statistics Version 20 and the results and a discussion are presented in the next section. The derived clusters were used to characterise more meaningful groups of entrepreneurial behaviour which are discussed in the next section.

#### 4. Results and Discussion

Analysis of the data revealed that the majority of vegetable farmers (approximately 51%) were in the age category of above 40 years and approximately 90% of the farmers were above thirty years of age (Table 3). Ninety one per cent of the farmers had farming experience of more than ten years (Table 4). Therefore, most were mature farmers with a fair experience in their farming activities.

Table 3: Age analysis of farmers (N=78)

<b>Age class (years)</b>	<b>Percentage of farmers</b>
Less than 20	2.6
20 – 30	7.7
31 – 40	38.5
41 – 50	44.9
51 and above	6.4
<b>Total</b>	<b>100</b>

Table 4: Experience in farming (N=78)

<b>Experience (years)</b>	<b>Percentage of farmers</b>
Below 10	9.0
From 10 up to below 20	38.5
From 20 up to below 30	47.4
30 and above	5.1
<b>Total</b>	<b>100</b>

The majority of farmers (approximately 90%) were educated up to or above the Ordinary Level Examination i.e. Year 11 (Table 5). This educational background enabled them to understand basic aspects of farming activities and to make farming decisions based on information received. There were no farmers with diploma or degree qualifications.

Table 5: Educational background of farmers (N=78)

<b>Level of schooling</b>	<b>Percentage of farmers</b>
Below ordinary level	10.3
Ordinary Level (year 11)	75.6
Advanced level (year 13)	14.1
<b>Total</b>	<b>100</b>

Approximately a third of the farmers were women (Table 6). Approximately 80% of farmers were engaged in full-time farming<sup>3</sup>. Approximately 96% of the farmers owned their farmland which was suitable as collateral for small farm credit. According to the farmer respondents, farmer group surety was also used by the banks for agricultural credit. Key informants stated that almost all of the farmland was inherited.

Table 6: Details of gender, type of farming and the nature of ownership of farmland (N=78)

<b>Criteria</b>	<b>Measure</b>	<b>Percentage of farmers</b>
Gender	Female	32.1
	Male	67.9
Type of farming	Part-time	20.5
	Full-time	79.5
Nature of ownership of land	Own land	96.2
	Family – no rent	2.6
	Family – rented	1.3

The range of vegetables grown by the farmers included tomatoes, leeks, beans, cabbage, radish, beet, knol-khol, lettuce, carrots, eggplant, okra and Brussels sprouts. Each farmer grew a combination of these vegetables during a season. A high proportion of farmers (50%)

<sup>3</sup> Full-time farmers are the farmers whose only source of income is farming. Farmers who have other sources of income and those who are engaged in farming for a secondary or supplementary source of livelihood are considered as part-time farmers.

had diversified into commercially grown (high value) perennial fruit crops such as oranges, pears and strawberries (Table 7). According to key informants, this was due to development projects which promoted growing of such crops as a means of new methods of farming such as intercropping. This was an indication of farmers responding to new crops and farm business ventures but their performance in this venture could not be determined by the study due to lack of farm records.

Table 7: Crop diversification by vegetable farmers

<b>Type of crop</b>	<b>Percentage of farmers grew the crop</b>
Commercially grown fruits <sup>4</sup>	50.0
Tea	28.2
Potato	11.5
Paddy	5.1
Vegetable nursery	1.3

Diversification into other cropping ventures such as tea, potatoes, paddy and plant nurseries has become a trend recently. However, according to farmers, diversification into tea and paddy required unique land management practices that could interfere with their main crop, vegetables, hence a low percentage of vegetable farmers diversified into these two crops (Table 7). Farmers pointed out that vegetable nurseries require capital intensive assets such as greenhouses, hence a low proportion of farmers entered into this sector of agribusiness.

Record keeping and farm planning were quite poor among the farmers. Sixty one and a half percent (61.5%) of farmer respondents maintained incomplete records of their farm transactions which did not facilitate budgeting and controlling, so neither a third party nor the farmers themselves could arrive at clear conclusions on the financial performance of the farm. Farm planning was very limited. Farmers just decided on the assortment of crops based on the market information available. According to the respondents and key informants, farmers did not have formal training or facilitation in record-keeping, budgeting or farm planning aspects.

Results showed 68.9% of farmers to be favourable to innovation (Table 8). The percentage of farmers showing a positive attitude towards growing new crops was approximately 79%. Seventy four (74%) per cent of farmers have shown their affinity towards trying new farming methods. Sixty three percent (63%) of the farmers claimed that they liked to try new farm inputs.

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<sup>4</sup> These were oranges, pears and strawberries.

Table 8: Details of farmers' responses on entrepreneurial attitude determinants (N=78 and all readings are in percentages)<sup>5</sup>

Entrepreneurial characteristic	Entrepreneurial Attitude Determinants	Farmer response		
		Yes	No	Not sure
Innovation	Growing new crops varieties	79.4	10.3	10.3
	Trying new inputs	62.8	19.2	18.0
	Adapting new methods of value addition	58.9	9.0	32.1
	Adapting new methods of farming	74.4	10.2	15.4
	Average response on innovation	68.9	12.2	18.9
Opportunity seeking	Using market information for key decisions	76.9	3.9	19.2
	Looking for new markets	62.8	32.1	5.1
	Gathering farming information from media	84.7	3.8	11.5
	Discuss about farming issues with farmer friends	78.2	9.0	12.8
	Attending farmer training programmes	87.2	5.1	7.7
	Using development project opportunities	78.2	2.6	19.2
	Average response on opportunity seeking	78.0	9.4	12.6
Risk taking	Investing in new farm equipment	48.7	42.3	9.0
	Obtaining credit to expand farm business	56.4	15.3	28.3
	Shift to controlled environment agriculture	42.3	30.8	26.9
	Be first in trying new crops	65.4	12.8	21.8
	Average response on risk taking	53.2	25.3	21.5

About 59% of farmers liked to try new methods of value addition, which is an important determinant of innovation (Table 8). However the scale of production is small<sup>6</sup>. Although they showed an affinity for new methods, there were practical issues that restricted farmers from adding value to their produce. According to farmer respondents and key informants, packaging and processing, which are possible at village level, may need operational-specific assets and sustainable markets that can pay premium prices for the finished product. Small scale farmers have neither of these. Therefore, an overall average of approximately 69% of positive attitudes towards innovation (Table 9) suggests a remarkable level of potential entrepreneurial behaviour. This also suggests that these farmers show a strong tendency to try new crop varieties, inputs, new methods of value addition and farming methods. Therefore, policy-makers and farmer support networks should take account of this characteristic and facilitate such innovation.

About 77% of respondents like to use market information for key agribusiness decisions (Table 8). The most important sources of market and farming information were media (approx. 85%), peers (approx. 78%) and farmer training programmes (approx. 87%).

<sup>5</sup> Scores of 1 and 2 on the Likert scale were taken as a presence of respective determinant or 'yes' while 4 and 5 were treated as an absence of the particular attitude or 'no'. Score of 3 was considered as 'not sure' or the presence or absence could not be determined.

<sup>6</sup> Mean landholding per farmer respondent as found-out in this study was 0.42 acres (min = 0.125, max = 2 acres, SD=0.24).

According to farmer respondents, the key information included prices, quantities (demand and supply), popular varieties and cultural practices. They relied on media including newspapers, radio channels and television. The vegetable farmers discussed day-to-day farming issues with their peers, some of whom were farmer leaders and champion farmers. According to respondents, most have their own mobile phone for communication and are prepared to receive farming and market information via mobile phones if such a programme is available. They also looked-out for information about suitable projects which promote and assist crop diversification activities, such as the commercial fruit crops development programmes already mentioned. This study revealed that, on average, a large proportion of vegetable farmers (78%) identified feasible opportunities to make rational farming decisions based on relevant information. There was an even stronger response towards opportunity seeking (average of 78%). Farmers were very alert to opportunities. Therefore, policy-making and farmer support mechanisms' prime goal should be to establish processes that can help these farmers to make use of such opportunities. It is clear from this study that most farmers are willing to take advantage of such opportunities.

According to the mean response for overall risk-taking, 53% of the respondents showed an affinity towards risk in agribusiness (Table 8), a high rate of willingness to accept some degree of risk. However it scored lowest among the three entrepreneurial characteristics tested in this study. According to the key informants, risk taking characteristics were more resource-hungry than the other characteristics and some farmers were therefore more cautious. Around half of the respondents believed in investing in new farm equipment and in seeking credit in order to expand their farm business (approx. 49% and 56% respectively). A considerable proportion of respondents (approx. 44%) were either not prepared or had not decided to obtain such farm credit. According to respondents and key informants, many farmers have their house on the farmland, hence their reluctance to use the farmland as collateral for fear of losing their house in the event of inability to repay. Therefore, for practical purposes, many lack collateral for credit.

Forty two per cent (42%) of the respondents were prepared to shift to controlled environmental agriculture to enable them to undertake year-round cultivation, which is quite risky. However, there were concerns as this involves extra capital expenditure for greenhouses and equipment such as sophisticated irrigation and lighting systems. Fifty eight per cent (58%) of the respondents who either disagreed or had not decided to shift to year-round cultivation were concerned about this extra cost of capital. Sixty five per cent (65%) of the respondent farmers were willing to be first in the area to try new crops. Key informants reported that Brussels sprouts were tried by many farmers in this area without significant success due to the relatively unsuitable climate for the crop in the area. However successful diversification with fruit crops did occur (Table 7). Therefore, policies and farmer support mechanisms could be devised to help farmers to take risks. Some of the measures suggested to this effect are replacement of collateral with mutual or community surety schemes (where one or more farmers in the community act as sureties for each other), adoption of more relaxed collateral schemes, facilitating resale of specific farm equipment and relaxing terms and conditions and documentation requirements for credit for the expansion of farm ventures.

The data gathered on entrepreneurial attitude determinants were used to compute the farmer entrepreneurial attitudes for each characteristic and overall entrepreneurial attitudes (Table 9). A large proportion of farmers were categorised as very (27.3%) or moderately (41.7%) entrepreneurial in relation to innovation. The rest were either un-innovative or doubtful about innovation.

Table 9: Proportions of farmers with different entrepreneurial attitudes (all numerals are in percentages)

Entrepreneurial Attitude	Entrepreneurial attitude characteristic			Overall
	Innovation	Opportunity seeking	Risk taking	
Very entrepreneurial	27.3	34.8	20.5	27.5
Moderately entrepreneurial	41.7	43.2	32.7	39.2
Doubtful	18.9	12.6	21.5	17.7
Moderately unentrepreneurial	11.2	6.6	19.5	12.4
Very unentrepreneurial	1.0	2.8	5.8	3.2

Significant proportions of vegetable farmers were very opportunity seeking and risk taking (34.8% and 20.5% respectively). Larger proportions of farmers were moderately opportunity seeking and risk taking; i.e. 43.2% and 32.7% respectively. The lowest scores in very entrepreneurial and moderately entrepreneurial attitudes were observed in risk taking where firm commitments of finance and other resources were expected of the farmers. The highest were in opportunity seeking where financial commitments were not so great. Nearly 27% of the vegetable farmers were very entrepreneurial in their overall entrepreneurial attitudes and approximately 39% of them were moderately entrepreneurial. Approximately 18% per cent of the farmers were doubtful in their entrepreneurial attitudes and approximately 12% of them were moderately unentrepreneurial in overall attitudes while approximately 3% were very unentrepreneurial.

Responses for the 20 variables considered in this study were coded for the purpose of hierarchical cluster analysis. The coded data for two farmer variables, farm record keeping and farm planning, were removed from the hierarchical cluster analysis as they did not show significant variation. The rest of the variables (18) were included in a hierarchical cluster analysis, which identified three clusters of variables. It was observed that two variables, gender and extent of farmland, did not cluster with any of the entrepreneurial attitude determinants hence they were considered as outliers. A second hierarchical cluster analysis performed after the removal of outliers generated two clusters. Homogeneity within clusters diminished sharply when the number of clusters was increased from two to three, with the agglomeration coefficient dropping sharply from 1183.9 to 916.0. Results of the hierarchical cluster analysis were captured in Figure 3 to illustrate positive correlations among entrepreneurial attitude determinants and the two farmer variables; experience of farming and educational background of farmers.

Farmer variables	Determinants of entrepreneurial attitude characteristics														
	VALADD	NWCROP	NWFARM	INPUTS	MEDIA	FMTRN	MKTINF	PEERS	DEVPRO	FIRST	CREDIT	NWMKT	EQUIP	CONENV	
EXPERIENCE	Innovation									Opportunity seeking					
EDUCATION												Opportunity seeking		Risk taking	
Cluster Number	2											1			

Key to entrepreneurial attitude characteristics

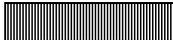
- Innovation 
- Opportunity seeking 
- Risk taking 

Figure 3: Relationships among variables determining entrepreneurial attitude of vegetable farmers.

It is interesting to note that gender, farm record-keeping, farm planning and the extent of farmland (outliers) did not have any positive correlation with entrepreneurial attitudes. The mean farmland extent was 0.42 acres (SD = 0.24) and the extent of the farmland of 94.9% of the farmers was 0.5 acres or less. Therefore, they are virtually all small scale operations which do not offer great flexibility for innovative use. Also, many of them had their family house in the farmland making it a sensitive asset. It is noteworthy that this does not practically permit concentration of landholding and potential landlessness. According to the respondents and key informants, farmers predominantly use family and shared labour<sup>7</sup> thus making vegetables a profitable small scale rural business. Cluster 1 includes only four variables (Figure 3). The opportunity seeking variable; looking for new markets, and the risk-related variables; investment in new farm equipment and shifting to controlled environment agriculture correlated positively with one another and with the farmers' educational background. Key informants also reported that shifting to controlled environment agriculture requires additional farming equipment which seems to be capital exhaustive. This is also linked with an extra output which may require new markets according to this cluster.

Cluster 2 includes the majority of variables (Figure 3). It was remarkable that all the variables representing innovation attitudes correlated positively to one another and to farmer experience in this cluster. According to agrarian services officers and other key informants, media and farmer training programmes provide valuable information, skills and knowledge for the farmer. Discussions with peers help farmers to resolve farming issues. Therefore, this cluster suggests that a combination of resolving farming issues, farmers' experience, and

<sup>7</sup> Farmers in the neighborhood helping each other free of charge.

farming and market information encourage farmers to look for and utilise opportunities provided by development projects (DEVPRO). The innovation variables; new methods of value addition, trying new crops, inputs, and trying new farming methods correlated positively with one another and with farming experience. According to respondents and key informants, success with new farming methods and new crops is best done with abundant experience and requires use of new farm inputs.

Variables signifying risk taking (being among the first few farmers to try new crops and obtaining farm credit to expand the farm venture) also correlated positively with one another and with farming experience in Cluster 2. This clustering suggests that calculated risk taking and obtaining credit blended by farmer experience are necessary for the expansion of farm business ventures. Conclusions drawn from these results and the relevant policy implications are presented in the next section of this paper.

## **5. Conclusions and policy implications**

The results confirm that the majority (approx. 67%) of the vegetable farmers in the upcountry areas in Sri Lanka were entrepreneurial in attitude; approximately 27% were attitudinally very entrepreneurial while 39% were moderately entrepreneurial in attitudes. Their entrepreneurial attitudes in relation to innovation, opportunity seeking and risk-taking behaviour were at fairly high levels. The results classify the remainder (approx. 33%) as attitudinally unentrepreneurial. Therefore, the results may assist unprejudiced selection of farmers for rural development activities and extension programs in Sri Lanka.

The analyses showed that entrepreneurial attitudes are determined more by educational background and farming experience than other socio-economic factors such as age, gender, extent of farmland, type of farming (part-time or full-time) and ownership of farmland. The level of farming experience relates positively to all three farmer entrepreneurial attitude characteristics; innovation, opportunity seeking and risk taking, but farmers' educational background has no significant association with innovative attitudes. Therefore, this study suggests that rural development initiatives in developing economies such as Sri Lanka should give more weight to farmers' experience and educational background than the other factors mentioned earlier, in the selection of farmer entrepreneurs. However, a clear distinction between livelihood-oriented operations and growth-oriented operations should be made as the latter, in addition to bettering the prospects of the entrepreneur, significantly contribute to job growth outside the household whereas the former are mainly self-employment operations. Growth-oriented agribusiness spreads the benefits to a whole community (ADB, 1997; Shaw, 2004) particularly in the developing country perspective.

Farmer-owned companies can be considered as an ideal rural socio-economic unit if suitable institutional arrangements are in place for the sustainability of the company (Rosairo et al, 2012). Export production villages that bring producers of a certain value added product into one company, is a rural development concept introduced in Sri Lanka (Kulatunga, 1993) but without much success (Rosairo, 2010). One factor attributed to this situation was the selection of members. This study endorses selecting only the entrepreneurial farmers as members (or shareholders) of these farmer-owned companies according to the variables used in this study. Small farmers may be able to reduce transaction costs to buyers by forming effective farmer-owned companies. Entrepreneurial farmers (66.7%) can join such companies as shareholders and the unentrepreneurial (yet experienced) farmers (33.3%) can be suppliers.

Such arrangements may spread the benefits to a broader community and unentrepreneurial farmers may also feel included in the development programmes which could be an empowering aspect in rural societies in Sri Lanka and other developing countries.

It is farming experience that gives impetus to the farmer to obtain farm credit and use opportunities before other farmers, but not their educational background. Most of the farmland was owned by the farmers themselves. However, the tendency to use their farmland as collateral is not always high as their houses are located in the farmlands. There is a chance of losing the land with the family home in the event of credit problems. As explained by Shaw (2004), financial barriers to entry are a severe impediment to poverty reduction in rural areas. According to the respondents, the financial constraint is the most important factor that hinders business expansion and shifting to controlled environment agriculture, which is non-traditional but a familiar operation for the experienced farmers. Therefore, policy initiatives could promote provisions such as more relaxed rural finance schemes, soft loans with grace periods of 2-3 years, group mutual sureties, and zero collateral on small and medium-scale loans. Provision of greenhouse structures and providing the right technical support for more entrepreneurial farmers can enhance rural development options.

There is potential for farmers to supply to vegetable processors and exporters as Esham and Usami (2006) suggested because processing and exporting companies have a positive perception of the ability of small farmers to be viable suppliers. The results establish that entrepreneurial attitudes towards market innovation and assuming risk on investment and farming are connected with farmers' educational background. Further, with increasing levels of education, vegetable farmers are motivated to take risks and expand their farm outputs to capture the benefits of new markets. Entrepreneurship can draw a route map out of poverty for the rural poor in developing countries. Based on a study in Sri Lanka, Shaw (2004) showed that a reason for difficulty in start-up for rural entrepreneurs (not necessarily only in agriculture) was that market environments do not present many alternatives. It is a reminder for the policy maker that market-oriented initiatives, for example, state and/or private sector facilitated forward sales contracts could enhance market facilitation for agro-entrepreneurs.

Innovation with value addition, and new farming methods, vegetable crops (including diversification) and inputs are better linked with farming experience than with farmers' educational background. Therefore, diversification comes with experience. A half of the vegetable farmers in the study area have diversified their farmland into commercially grown fruit crops, perennial crops in particular. Experienced farmers assume more agricultural risks than less experienced farmers with more years of education. Results suggest that it is the experienced farmer who is more willing to take risks with farm credit and is more prepared to look for sources for markets and other agricultural information.

Entrepreneurial behaviour is a function of entrepreneurial abilities and entrepreneurial attitudes (Fitzsimmons and Douglas, 2005). Therefore, policy interventions to enhance the entrepreneurial abilities and skills of these farmers may enhance their overall entrepreneurial behaviour to improve their business success. The results suggest the provision of formal training programmes on record keeping and agribusinesses planning, as even the most attitudinally entrepreneurial farmers were found to be weak in these aspects. Therefore, this study suggests selecting the attitudinally entrepreneurial farmers in the first instance and providing them with entrepreneurial skills training because agricultural extension programs alone are not sufficient as business environments are changing quite rapidly.

Product lines of upcountry vegetable farmers in Sri Lanka are quite homogeneous in that farmers all grow the same range of vegetables (Section 4). This homogeneity makes these farmers less competitive. This is particularly true in farmers' society where price and place competition are treated with hostility. Therefore, product differentiation becomes an alternative. On the contrary, everybody growing the same range of crops is useful if farmers are going to work together to establish farmer-owned companies that look for economies of scale. Therefore, the choice of approach (homogeneity or differentiation) is situational and needs to be observed by policy making bodies in Sri Lanka and other countries with comparable contexts prior to proposing action plans. A key factor that may influence the results in the specific area surveyed is the lack of differentiation of farmers in terms of land area. In an area with greater differentiation in land area and less stable land tenure the opportunities available to farmers with different asset profiles might be very different and innovation could exacerbate inequalities.

Linking farmer entrepreneurial attitudes to entrepreneurial behaviour or business performance is a very important aspect of research. Future research could use the performance data such as financial details to ascertain their business success. A longitudinal study is suggested for this purpose. Research could also be undertaken to study developments over a certain period of time. The results identified entrepreneurial characteristics and classified farmers quantitatively according to their entrepreneurial attitudes. Further research is also suggested to test the entrepreneurial skills of farmers. Outcome of this cluster of research i.e. entrepreneurial characteristics, attitudes and skills, can help development organisations to draw plans to develop those aspects of farmers in upcountry areas of Sri Lanka and also in other developing countries with comparable settings.

The technique used to analyze the data was not intended to rank the variables or their determinants according to their relative importance. It could not be concluded, for example, that risk-taking is a more important variable than opportunity seeking in the context of upcountry vegetable farmers in Sri Lanka. This type of ranking would require multivariate analysis done with a much larger sample of vegetable farmers.

This study was undertaken using only three key variables to indicate how entrepreneurial the vegetable farmers were. However, there may be more variables that were not used, mainly due to financial constraints. Therefore, a broader longitudinal study involving more variables of farmer entrepreneurial attitudes and a comparative analysis with areas with more unequal asset distribution would help establish the wider significance of the results of this research.

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