

## **Analysis of market participation among vegetable farmers in north- central province, Sri Lanka**

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### **1. Introduction**

Market participation can be identified as a means of effectively integrating smallholder farmers into commercial-level agriculture. Improved market access provides the opportunity for agricultural households to shift from subsistence farming to commercial level farming (Makhura, 2001; Jagwe et al., 2010). Nevertheless, the participation of farmers in domestic and regional markets in Sri Lanka remains low due to a range of constraints. Poor market access of the farmers can be specified as one of the constraints. Market participation of farmers has been widely studied in other developing countries (Kassa et al., 2017; Amao & Egbetokun, 2018; Kyaw et al., 2018). However, very few studies have empirically investigated the market participation of smallholder farmers in Sri Lanka (Abeykoon et al., 2014). The objectives of the current study were to analyze the market participation among vegetable farmers and to determine the factors that influence market participation in North- Central Province, Sri Lanka.

### **2. Materials and Methods**

Using stratified sampling technique, 93 smallholder vegetable producers in Anuradhapura and Polonnaruwa districts were selected for the primary survey. Data were collected using pre-structured, interviewer-administered questionnaires through face-to-face interviews and telephone interviews. Before the original survey, for the initial research, pilot tests were conducted with a sample of 10 smallholder farmers to confirm that there were no limitations, weaknesses, or shortcomings in its design and data collection equipment. The data were analyzed using the descriptive statistics, and Heckman two-stage selection model. To process the data STATA computer program was used.

### **3. Results and Discussion**

Descriptive analysis results showed that 89% of market participants are male farmers. This showed that a large percentage of market participants are male-headed households. Smallholders, mean age was 48 years old; the mean household size was 4. Among them, 46% of the respondents had access to agricultural extension services. The remaining 54% of the respondents did not have access to extension services. Regarding access to credit, 74% of the respondents had access to credit. The educational attainment of the respondents revealed that 48% have secondary education up to GCE O/L. Regarding access to market information, 71% of the respondents had access to market information from formal and informal sources (like neighbours' and brokers), and the remaining 29% of the respondents did not have access to information. Out of the total vegetable growers, most of the market participants have inherited lands (68%). When considering farmers' perception of vegetable market price 51%, of the farmers, were satisfied with vegetable market price while none of the farmers were dissatisfied with the vegetable market price. 30% of the farmers, were facing the problem of the intermediary effect both from medium and large-scale producers and from brokers.

The Heckman two-step model was used to determine the factors influencing market participation decisions and the extent of the market participation decision of the farmers. According to the probit model results (Stage 1) reported in Table 1, gender, off-farm income status, vehicle ownership, access to market information, and farming experience significantly

influenced the farmer's decision to participate in the vegetable market. Ordinary least squared regression was estimated in the second stage of the Heckman outcome equation to determine the factors that influence the extent of market participation. The results revealed that access to market information and farmers' perception about vegetable prices significantly determine the extent of market participation.

The Inverse Mills Ratio (IMR/Lambda) or selectivity bias correction factor was positive at (4.2666) but had a statistically insignificant impact on the value of the vegetable sale. This result suggests that no unobserved factors that might affect both probabilities of market participation and the level of market participation. The difference in the probability of market participation among smallholders was defined using marginal influences.

**Table 01. The Heckman two-step: selection equation and outcome equation results**

Heckman selection model -- two-step estimates Number of obs = 93 Selected = 65, Non-Selected = 28, Prob > chi2 = 0				
Variable	Parameter Estimates		Marginal	
	Effect			
Market Participation	Coef.	Std. Err.	P> z	Coef.
Gender	2.198**	1.003	0.028	0.157
Education	0.798	0.546	0.144	0.057
Off-farm Income	-1.812**	0.902	0.044	-
				0.129
Vehicle ownership	2.743**	1.075	0.011	0.196
Access to market information	2.776**	1.384	0.045	0.198
Access to extension services	-0.527	1.124	0.639	-
				0.038
Farming Experience	0.112**	0.058	0.055	0.008
Land size	0.199	0.211	0.343	0.014
Access to credit facilities	0.544	0.977	0.578	0.039
Constant	-6.391	2.808	0.023	
Level of Market Participation				
Farming Experience	0.111	0.137	0.415	
Gender	0.607	4.581	0.895	
Household size	1.475	1.058	0.163	
Off- farm income	2.349	2.029	0.247	
Access to market information	15.336**	6.295	0.015	
Market value	17.475***	2.682	0	
Constant	16.811	10.995	0.126	
Mills lambda	4.267	5.767	0.459	
Rho	0.543			
Sigma	7.859			

\*\*\* = significant at 1%, \*\* = significant at 5%

#### 4. Conclusions

This study analysed the market participation of vegetable farmers in North Central Province, Sri Lanka. These findings provide useful insight into what factors need to be the target to stimulate market participation and the intensity among farmers. The study found that the market participation of vegetable farmers is constrained by several factors such as intermediary effect and poor infrastructure. As revealed by the econometric analysis, market participation is

significantly determined by such factors as gender, off-farm income, vehicle ownership, access to market information, farming experience, while the intensity of market participation is determined by access to market information and market value. In order to promote the market participation the government and the non-government institutions should concentrate on improving the accessibility for market information (price trends, market requirements and standards, future demand and dynamics in consumer preferences) and lowering the transaction costs.

## 5. References

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