Willingness to adopt chemical leasing service by vegetable farming in Nuwara Eliya district, Sri Lanka

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Introduction

Chemical leasing service is a new strategic business model which is service oriented to promote sustainable chemical management. This research paper aims to examine factors affecting on farmer willingness to adopt in chemical leasing service. Chemical Leasing definition developed by, United Nations Industrial Development Organization (UNIDO) "Chemical Leasing is a service-oriented business model that shifts the focus from increasing sales volume of chemicals towards a value-added approach. This represents an integrated preventive environmental strategy and a clear win-win situation for industry and the environment. The specific objectives of this study were to determine the vegetable farmers' willing to adopt on the chemical leasing model, to determine the vegetable farmers' willingness towards a chemical leasing service.

Materials and methodology

Willingness to pay for agricultural services is influenced by a number of paradigms including the innovation-diffusion model (Francis M, el al 2010), economic constraints model (Makokha et. al, 1999).

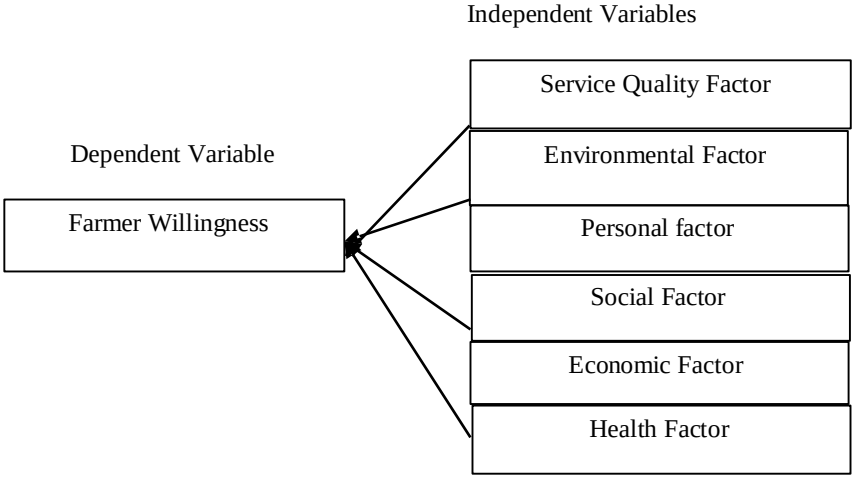

Figure 1: Conceptual Frame work

Figure 2.1 above shows the theoretical framework of the study. There are two variables discussed in this study as independent and dependent variable farmer willingness to adopt in chemical leasing showing dependency on Personal, social, economy, farmer health, environment, and Service quality.

The data applied in this study were collected in Nuwara Eliya by a questionnaire. The sample was determined by simple random sampling method. 150 farmers were selected as responders. Each head of household he/she was given a brief introduction about Chemical Leasing Service. The questionnaire used in the interviews was structured in one section contained straightforward questions. From second section to sixth section there are statement wise questions. Participants were asked to provide marks for the statements which are affected to their willingness to adopt Chemical Leasing service on decision.

Farmers were requested to record their responses on a five point likert scale as follows: Strongly disagree (1), disagree (2), not clear idea (3), agree (4) and strongly agree (5). The definitions of demographic/personal, social, environment, economic, health variables, and service quality variable and descriptive statistics of the sample are presented in descriptive statistics table. To achieve the objectives of this study; Chi-square test and Binary Logistic model were used. In the first analysis, chi-square contingency test was used to determine willingness to adopt chemical leasing service frequencies is independent of the respondents' demographic and other factors. The statistical program, Statistical package for Social Science (SPSS for Windows, version 22, SPSS) was used to transform where necessary, tabulate and analyse the data.

In binary logistic model the decision choice is a whether or not to have, adopt or not and this response is binary it takes on two values 0 and 1. Y= {0 *if* No, 1 *if* Yes}.

$$\text{logit}\,[p(x)] = \log\,[p(x)/1\text{-}p(x)] = a + b_1x_1 + b_2x_2 + b_3x_3 \ldots\ldots\ldots b_k x_k$$

p = the probability that a case is in willingness to adopt,

a = the constant of the equation and,

b = the coefficient of the predictor variables.

X_1= Age

X_2= Area

X_3= outcome

X_4= Cost

X_5= pressure

X_6=Training

X_7=Store

X_8=Pay

X_9=Method

X_{10}=Safety

X_{11}= Other

X_{12}=Concern

X_{13}= Waste

Results and Discussion

A total of 150 observations, all with complete information on the variables included in the empirical model, were analysed. As valid percent only 80% of the respondents are willingness to adopt for chemical leasing service. The other respondents are 20% are not willingness to adopt for chemical leasing service. From frequencies of 150 respondents 120 responders willing to accept this new strategic model and other 30 responders are not willing.

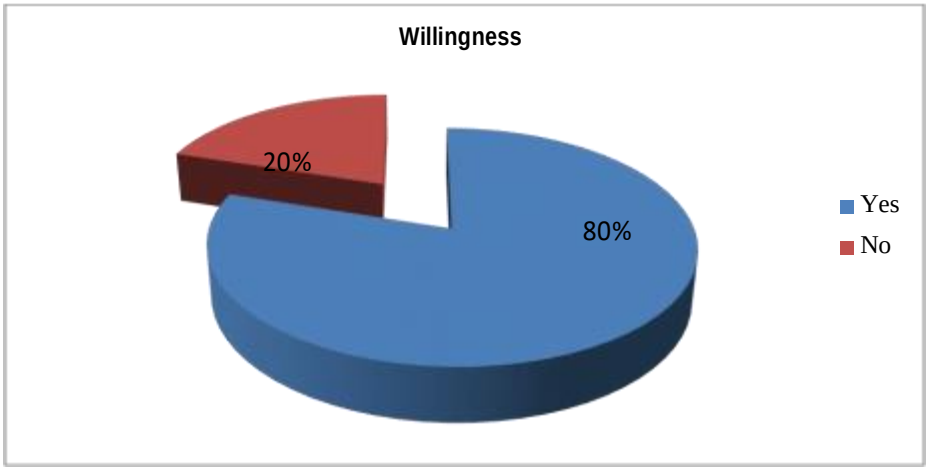

Figure 2: Descriptive Statistics Results of willingness to adopt chemical lasing service

Regression Model yielded following results.

The relationship between the willingness to adopt chemical leasing service and the selected demographic characteristics and other factors are shown in Table 5. Results suggest that there are statistically significant relationships between willingness to adopt chemical leasing service and essential prerequisites with chemical leasing service. The age and area were measure as range and the other all the variables were measure using five point liket scale.

Table 4.8: Estimated parameters and their statistical significance levels

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Age	-3.537	1.649	4.603	1	.032*	.029
	Area	4.811	2.480	3.762	1	.052	122.844
	Outcome	3.538	1.508	5.503	1	.019*	34.407
	Cost	3.005	1.383	4.719	1	.030*	20.178
	Pressure	5.111	2.232	5.246	1	.022*	165.850
	Training	5.951	2.569	5.368	1	.021*	384.132
	Store	4.532	1.967	5.310	1	.021*	92.903
	Pay	6.757	2.995	5.091	1	.024*	859.808
	Method	6.550	2.863	5.233	1	.022*	699.300
	Safety	8.334	3.537	5.552	1	.018*	4161.546
	Other	4.168	1.924	4.694	1	.030*	64.598

	Concern	-.634	.676	.878	1	.349	.531
	Waste	7.264	3.140	5.353	1	.021*	1428.196
	Constant	-135.053	55.980	5.820	1	.016*	.000

a. Variable(s) entered on step 1: Age, Area, Outcome, Cost, Pressure, Training, Store, Pay, Method, Safety, Other, Concern, Waste.

* = Statistically significant at the 0.05-level

Consequently farmer's age groups, expected outcome, cost of agrochemicals, family pressure, trained people, storing facilities, paying method, service method, safety concern, other inputs given and waste disposal method's easiness variables are the affected predictors. However all the factors which are considered in study were significant and affect to the farmers' willingness to adopt chemical leasing service.

Logit (Probability of willingness to adopt) = -135.03 -3.537(Age) + 3.538(Outcome) + 3.005(Cost) + 5.111(Pressure) + 5.951(Training) + 4.532(Store) + 6.757(Pay) + 6.550(Method) + 8.334(Safety) + 4.168(Other) + 7.264(Waste)

Conclusion

Sri Lankan agro chemical consumption has grown rapidly while increasing harms to environment and health. The objectives of this study were to assess consumers' socio-economic/demographic characteristics, attitudes and perceptions on the willingness to adopt chemical leasing service. For estimation technique, Chi-square and binary logistic model were specified and analyzed using survey data in Nuwera Eliya district, Sri Lanka.

This study showed that about 78.9% of consumers in the sample willing to adopt this new innovative strategic model.

The findings of this study indicated that farmer's age, expected outcome of agrochemicals, cost of agrochemicals, and Farmers' family pressure, trained people in chemical application, agro chemicals storing facilities, are the demographic and socio economic factors determining significant of consumers' willingness to adopt chemical leasing service.

References

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