

ECONOMIC EVALUATION OF HOMESTEAD AGRO FOREST IN VAVUNIYA DISTRICT

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Introduction

In the Northern Sri Lanka development of homestead agro-forest has been given higher priority in the *Vadakin vasantham* rehabilitation programme. In Vavuniya district the Department of Agriculture and the Department of Forestry have implemented several agro forest programs including homesteads agroforests which provide many livelihood support forest services and products to the poor. Dependency on forest by the poor resettled people was found to be high in Vavuniya district (Thiruchelvam and Sujeetha, 2006). Homestead agro forest has been successfully used as a technique to alleviate the poverty in Vietnam (Kham and Thuy, 2005 Ref). Karunarathna and Gunatilake, (2002) have emphasized the need to care on the combination of trees and annuals to increase the income of poor household in long term and short term respectively. But many social forestry programmes failed in Sri Lanka due to lack of bottom up planning in designing a suitable model for the poor farmers. In this context this study focuses on investigation of suitable homestead agro-forest model and its potential in adoption by the poor households in Vavuniya district. The study hypothesized that there was no difference in profitability between

the improved homestead agroforest compared to prevailing traditional agro forest systems in the district.

Methodology

Vavuniya DS Division was purposely selected for this. From five GN Divisions 45 households were randomly selected and interviewed during July 2010 with a pre tested schedule. Aggregation was done by giving weights to five categories of trees and crops. Simpson Diversity Index was employed to develop a suitable homestead agro-forest model. Conceptual model of the study is depicted in Figure 1. Economic analysis using direct measurable costs and benefits was carried out to find out the profitability of the homestead agroforest model. Net present value (NPV), benefit cost ratio (BCR), internal rate of return (IRR) and payback approach (PBP) were calculated at 10% discount rate. Sensitivity analysis was done to check the sustainability of the model under increased cost and reduced benefits.

The logit model was used to test the factors affecting adoption of improved homestead agro forest model. Dependent Variable = the probability of the i^{th} farmer to adopt home stead agro forest system. Many values were zero. 1 for adopting and 0

for non adopting. The general form of the Logit model is:

$$\ln\left(\frac{P_i}{1 - P_i}\right) = \beta_0 + \sum \beta_i X_i + e_i$$

Where, P_i = probability to adoption of i^{th} farmer of HSAF

P_i = 1 if a farmer adopt to HSAF if not 0

X_s are Demographic, Economic & Outside factors

Results and Discussion

The average household size was 4 and the average number of family labor was 2. Almost all the household heads had obtained primary and above education level. About 42% of the households were Samurdhi beneficiaries. The average size of the homestead and the average monthly income from homestead were 0.13 ha and Rs.5693 respectively. The homestead agro forest trees including multipurpose trees (Palmyra,

Coconut, Neem etc..) fruit trees (Mango, Jack, Wood apple, Gauva, Citrus Spp., Pomegranate, Banana and Papaw) and annual food crops in 0.1 ha for 30 years can yield a net present value (NPV) Rs. 389,393 and 11 benefit cost ratio (BCR). This was ten times higher than presently followed traditional food based agro forest system. When the length of years reduced from 30 to 20 years and benefits were reduced by 50% the BCR and NPV changed to 3.68 and Rs.75,665 respectively. These results are very impressive for higher adoption of agrofrest recommended trees by poor households in the district. .

The adoption model results given in Table 1 below show that adoption was significant and positively related to educational level and family size negatively related to experience. Age, income and extent showed no significant influence on adoption.

Table 1: Logit estimates of the adoption of improved homestead agroforest

Independent Variables	Estimated Coeff.	P>t
Age (yrs)	0.105	0.235
Family size (No)	0.214*	0.085
Education (yrs)	0.181*	0.072
Monthly income (Rs.)	- 0.001	0.622
Experience (yrs)	- 0.019*	0.067
Extent (ha)	- 1.344	0.031
Credit Dummy	4.327	0.314
Constant	0.195	0.840

Level of significance * = 5%;
 R^2 (adj) 0.435, FV=8.1, Df. 54 ,

This implies that educated people were interest in homestead agroforest. The adoption is not affected by the age, income and the available land

extent available for the homestead agroforest.

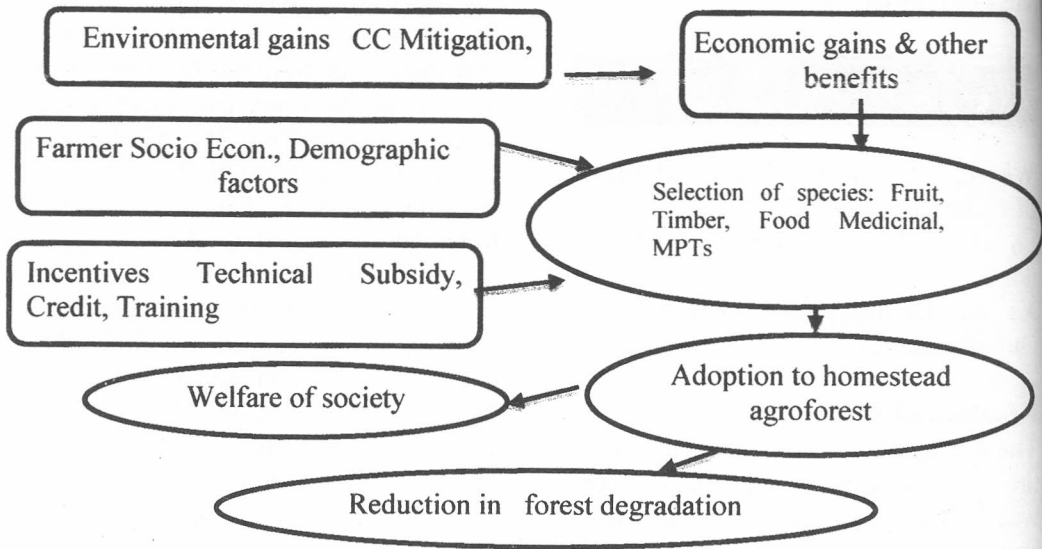


Fig. 1. Conceptual Frame work

Conclusions

The economic analysis results showed that the developed homestead agroforest model is economically viable and sustainable for studied location. Therefore the poor households would benefit more by adapting to the agroforest model. Since education level affects the adoption positively, good awareness and effective training on the recommended agroforest model and marketing of agroforestry products are recommended. Further studies are needed for non market evaluation of the homestead agro forest in Vavuniya district. For the poor households to develop their production systems, additional assistance is needed.

References

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