

AN ASSESSMENT OF THE IMPACT OF INDIVIDUAL TIME PREFERENCE ON  
FOREST RESOURCES EXTRACTION

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## ABSTRACT

The purpose of the study, broadly, is to understand how the peripheral community's behaviour and their socio-economic situation affect forest resource extraction. To fulfil this purpose, this study focuses on achieving four specific objectives - (i). To estimate the demand for selected non-timber forest products (NTFP). (ii). To estimate the individual rate of time preference (IRTP) of peripheral communities of the Sinharaja forest. (iii). To identify socio-economic factors affecting IRTP and (iv). To assess the impact of IRTP on rate of NTFP extraction in the Sinharaja forest.

Demand models are estimated for five forest products that have high collection frequencies. Except aggregate NTFP demand model whose dependent variable is a quantity index, other dependent variables are the quantities of each NTFP extracted per annum. The innovation in this analysis is the use of shadow price to estimate the demand. Independent variables are own price, substitute price and income. The Ordinary Least Squared technique is used to estimate the models. Five demand models consistently show a negative relation with own price. Therefore, the imputed prices for subsistence forest products using time allocation for NTFP collection is accurate. The influence of the income on extractions of NTFP, *Beraliya* and *Hal* are negative whereas fuel wood and *Goraka* are positive. The influence of substitute price on NTFP and fuel wood demands is unexpected. Except *Beraliya*, own price elasticities of all other products are inelastic. Income elasticity of all products is not consistently negative. Therefore, all non-timber

forest products are not inferior goods. Due to the limited impact of changes in income of the rural community on forest extraction, the successful use of tax or subsidy on wages to control extraction level is likely to be impractical. Different impacts of price and income on subsistence and commercial NTFPs compel us to consider these two categories in policy formulation.

The time preference question is based on the reference point model. The rate of time preference is estimated considering the value of annual forest extraction by each respondent as the base value and assuming the constant exponential discount function. The estimated rate of time preference declines with the delayed consumption years. The average discount rate of villagers for future consumption is 0.24. This average value is slightly above the existing market rate (0.192). The rate of time preference declines when income increases.

After confirming their simultaneity, the time preference and NTFP extraction equations are estimated using the Two Stage Least Squares procedure. Log-log specification for both models indicates better results than linear models. The impacts of base value, income, age and risk for resource utilization on IRTP is significant and support the theoretical expectations. IRTP, other income, family size, male/female ratio, distance to the forest, and index to market incorporation influence significantly the rate of NTFP extraction. Their influences are consistent with theoretical tenets.

The findings of the regression analysis on factors influencing the IRTP are in line with previous findings. This indicates the accuracy of the estimated values of IRTP. The declining IRTP with future years questions the validity of using a constant rate in discounting. Time preference positively influences NTFP extraction. Therefore, the reduction of IRTP may be important to reduce NTFP extraction by manipulating factors influencing IRTP. The provision of facilities for income generating activities in addition to agricultural activities and the encouragement of the existing permit system for *Kithual* tapping and cultivation of commercially important trees in own lands should be included in forest conservation programs.