Background

Natural rubber is a major export commodity and a big source of foreign currency for Indonesia. Over 1.3 million households get their income from smallholder rubber ‘gardens’ (<5 ha) and produce 73% of the national production (DGE, 1996). Most smallholders practice the traditional low-input-low-output system. More intensive systems with higher latex productivity are being promoted in rubber producing provinces in the country. The Rubber Agroforestry System (RAS) technologies, require less capital and labor and are appropriate for smallholder farmers with limited resources (Joshi et al.).

For smallholders to assess the range of rubber-based systems, a careful analysis of input and potential output from these systems is essential. Furthermore, it is also necessary to understand the potential impact of price and policy changes on their economic performance.

A range of rubber-based systems currently practised in Sanggau District, West Kalimantan were included in the current analysis. The farming system modeling software “Olympe” developed jointly by INRA/CIRAD/IAAM, was used to construct farm budgets, analyze and model farming systems performance. The tool enables a comprehensive overview of farmer situation and links to technical innovations and practices.

Methodology

Olympe enables the modeling of farming systems in order to characterize them, to identify typologies as well as allows prospective analysis according to price and yield evolution. It also permits the analysis at the level of farmer groups. The software helps build scenarios according to price, climatic events or various types of risks. Impact assessment at the regional level on various groups of farms is possible.

One of the main outputs of such approach is to assess impact of technical alternatives or choices at the farming systems level - both economical and environmental. Olympe uses data from farming systems surveys and provides key information in terms of diagnosis as well as prospective analysis.

Output examples from Olympe:

- annual and perennial cropping systems and technology;
- comparison between different cultivation system, cost, productivity and resource need;
- farmer typology based on local condition to see global overview in order to develop recommendations for each farmer group.

Conclusions

While RAS technology requires more capital input than traditional system, returns to labour and return to land are significantly higher

While monoculture rubber offers better rubber productivity, it requires high capital and input that is beyond reach for most smallholders, especially during the immature period.

RAS approach allows income diversification with food crops, timber and other NTFPs.

Olympe software is extremely informative and useful for analysis using real farm data; but is rather data-hungry.

Olympe output is easily customisable and can cater for most economic analysis.

Although we used the tools in rubber agroforestry context, the software is easily adaptable to other farming practices.