

Policy research for sustainable upland systems in Southeast Asia

The Alternatives to Slash-and-Burn (ASB) Programme, coordinated by ICRAF, was developed to address global problems such as climate change and loss of biodiversity while tackling local issues such as reducing poverty and increasing household food security. In this article, **TP Tomich, DE Thomas and M van Noordwijk** explain how policy research plays a key role in determining which alternatives to slash-and-burn should be considered, and when.

balance environmental objectives with economic development and poverty reduction. There are at least three major areas to consider: Agroforestry versus other upland systems, Land and tree tenure, and National policies and land-use change.

The key hypothesis underlying the ASB research project in Southeast Asia can be summarized like this: *Intensifying land use as an alternative to slash-and-burn can reduce deforestation and reduce poverty.* But when is intensification a

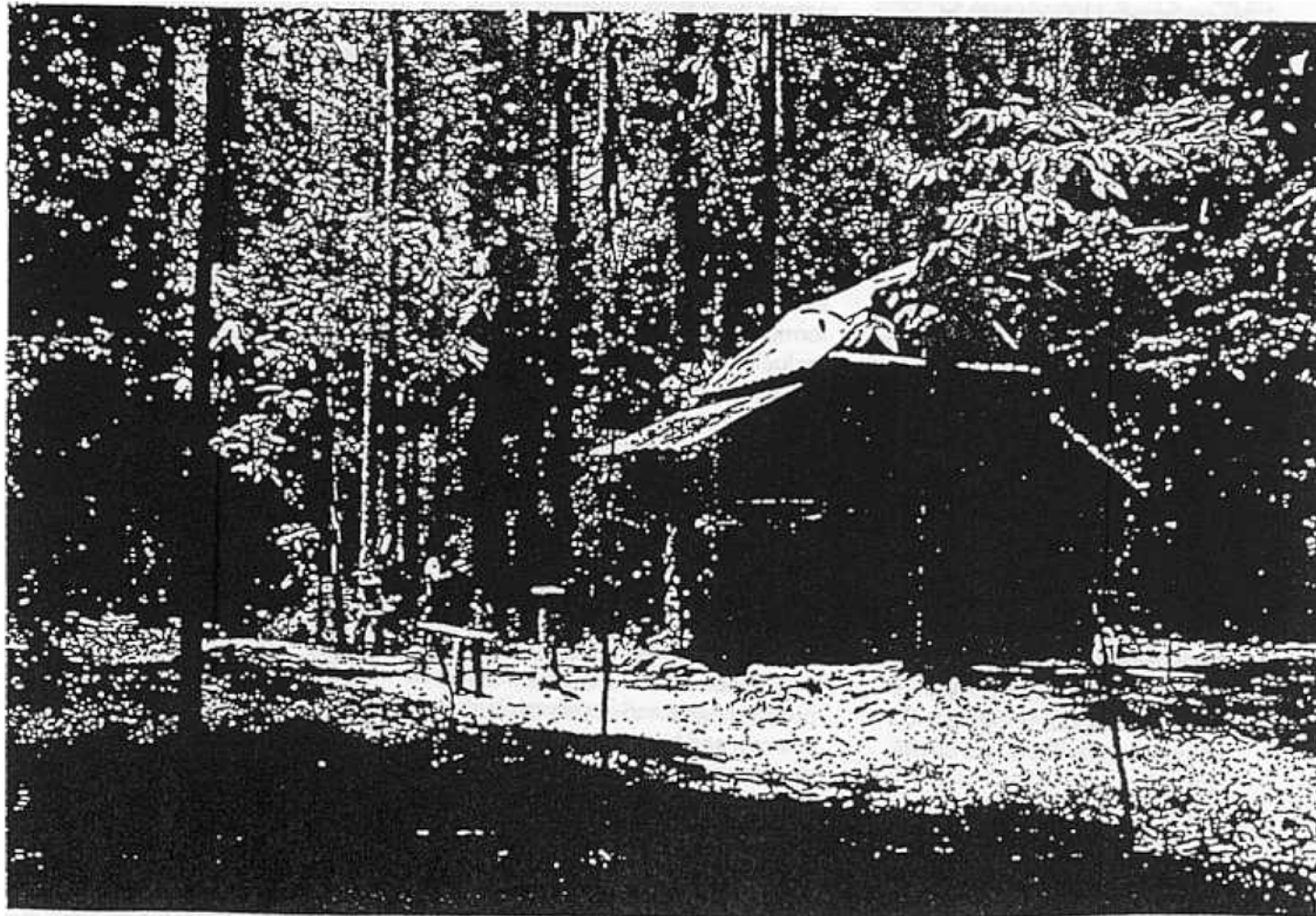
reasonable approach and when is it not?

The ASB programme is designed to determine whether intensifying agroforestry production in specific upland settings can help Southeast Asian countries and donor agencies

Agroforestry versus other upland systems

At the *field level*, intensification of land use should be pursued only if it is ecologically and agronomically sound, socially acceptable and

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All along the paths in the damar agroforests of Krui, one can find shelters where damar resin is collected by small-scale middlemen from the village.



Slash and burn

In most places it is found, 'slash-and-burn' refers to both a *technique* for converting forested land into other land uses (slash-and-burn agriculture) and an extensive land-use system that leaves land fallow after a few years of growing crops (shifting cultivation). Traditional shifting cultivation of food crops, as practised by generations of local people in Southeast Asia's uplands, was sustainable as long as population densities were low enough to allow long fallow rotations. But as populations increase and more and more people migrate to the forest margins, shifting cultivation becomes an unsustainable land-use system. Too often, fragile upland soils are slashed and burned and then continuously cropped with no fallow period, leading to degraded and nutrient-depleted soils.

Slash-and-burn as a technique of land clearing is used by virtually all those (public and private, large and small-scale) who contribute to forest conversion because fire is the cheapest, most effective means to clear land (*Agroforestry Today* 10(1): 4). Converting tropical forests, regardless of the technique used, causes loss of biodiversity and releases stored carbon and may also contribute to sedimentation, flooding and seasonal water shortages downstream.

financially profitable for smallholders. Raising the productivity of existing agroforestry systems and emerging local innovations offers one promising intensification pathway.

Considerations include:

- In what ways are agroforestry systems superior to other major land-use systems in profitability, agronomic sustainability and environmental impact?
- Is the relative profitability of alternatives skewed by distortions in price policies, trade policies or macroeconomic management?
- What are the tradeoffs across these various economic and environmental objectives and under which circumstances do particular agroforestry systems offer an attractive balance?

Alternative land uses at the forest margins have varying degrees of success in their ability to conserve biodiversity, act as carbon sinks and conserve soil and water. Conversion of primary forest has the greatest impact on the supply of forest functions, but the resulting alternative land uses will also have environmental implications. Measuring the environmental consequences of various land-use systems is an essential part of formulating sound policy responses — including whether or not intervention is needed.

Land and tree tenure

At the *community level*, effective monitoring and enforcement procedures must be developed to protect boundaries of forests that are not intended for conversion to other uses. Land and tree tenure institutions — both formal and informal — affect property rights and access to resources, and have a major influence on incentives and disincentives for sustainable resource management.

Considerations include:

- Do existing formal and informal institutions and the regulatory framework create incentives that are compatible with sustainable resource management?
- Do tenure institutions and regulations establish and enforce clear resource access and property rights?
- What can governments do to better support improved functioning of these institutions?

Existing controls on access to resources are usually inadequate to address poverty and land pressure in Southeast Asia. The result often has been increased conflict among communities and between rural populations and the state institutions that manage forests. However, exceptional windows of opportunity currently exist in the region for institutional innovations aimed at truly involving local people in forest resource management (see story on page 25).

National policies and land-use change

At the *national level*, attention must be given to the broader forces that drive deforestation. For example, an inflow of migrants facilitated by construction of new roads and driven by lack of economic opportunity elsewhere can swamp the effects of interventions at the field or community level. The recent return of severe financial instability in Southeast Asia combined with new global and regional trade agreements may lead to significant dislocations of people and economic activity.

Priorities for research on national policies affecting deforestation may be grouped in two sets of policy instruments that influence incentives for forest conversion:

1. *Market access.* Market access affects opportunities for land use by smallholders and large-scale operators and for local entrepreneurs, including those engaged in activities linked economically to forestry and agricul-

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ture, such as nursery owners, seed producers, commodity processors, traders and transporters.

Considerations include:

- Do efficient local markets exist for products?
- Are credit markets efficient?
- Are roads adequate and in the right place?
- Are markets for tree products and germplasm supplies functioning?

The road system has powerful effects on people's access to resources and marketing links that condition land-use choices in the uplands. Is transport infrastructure (especially the road network) sufficient for marketing agroforestry products? If transport is a bottleneck, how will road construction change land use?

Germplasm used in agroforestry systems may come from a mixture of sources, including the natural forest, existing local cultivated populations or through public or private propagation and distribution channels. The size and variability of the available gene pool, choice of propagation techniques and efficiency of germplasm markets may strongly affect an agroforestry system's profitability through the type, quantity and quality of its outputs, as well as its vulnerability to pests, diseases and environmental stress.

2. Trade and macroeconomic policies. Trade and macroeconomic policies affect people's livelihood options, reducing or intensifying forces that push migrants to forest margins. In subsistence-oriented communities that have long resided in remote forest areas, policies can affect opportunities for them to become more integrated into national economies, which could alter local land-use patterns (and their sustainability) or shift labour away from agriculture or forestry into other sectors of the economy.

Considerations include:

- Are current trade and macroeconomic policies compatible with sustainable natural resource management by households? If

not, what are the policy reform options?

- Are expanding employment opportunities in other sectors likely to take pressure off protected forest areas? If not, is forest conservation hopeless?

Impact through support for policy reform

Impact on institutional development and policy reform can only be achieved by a participatory, client-driven approach, calling on a range of disciplinary skills. ASB research priorities are driven by the needs of two broad groups of clients: smallholder farmers living at the forest margins in Southeast Asia, and policy makers who influence the range of choices available to these smallholders. Just as participatory methods are used in ASB research to understand smallholders' objectives and constraints, consultation with policy makers is also a hallmark of this client-driven approach to policy research. The focus of consultation is to obtain crucial insights from policy makers about their perceptions of problems, opportunities and constraints in order to guide the iterative process of research to identify and develop feasible policy options.

ASB policy research in Southeast Asia integrates social and economic analysis with measurements of the biophysical outcomes of land-use change and with efforts to identify opportunities to improve indigenous agroforestry systems. Taken together, these multidisciplinary research activities provide an unprecedented opportunity to quantify policy problems and tradeoffs and to formulate meaningful policy recommendations. This approach to real problems is already paying off in Indonesia, where national scientists have presented results of ASB research to policy makers at the highest levels. ☉

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A policy breakthrough for Indonesian farmers in the Krui damar agroforests

In January 1998, Djamiloedin Soeryohadikoesoemo, Indonesia's Minister of Forestry at the time, signed a historic decree that established — for the first time in Indonesia — an official precedent for community-based natural resource management. Based on the minister's concept for a distinctive forest-use classification, 'Kawasan dengan Tujuan Istimewa' (KdTI), the new decree recognizes the legitimacy of community-managed agroforests on a significant area of State Forest Land.

This decree recognizes the environmental and social benefits of an indigenous land-use system (damar agroforests), the role of indigenous institutions in ensuring the sustainability of this natural resource management system, and the rights of smallholders to harvest and market timber and other products from trees they planted. While the new KdTI area still is part of the State Forest Zone, this classification is unprecedented in that:

- it sanctions a community-based natural resource management system as the official management regime within an area of the State Forest Zone;
- it allows local people to harvest timber from within the State Forest Zone;
- it allows limited harvesting of timber from within an area classified as 'watershed protection area';

- it devolves the management responsibility of State Forest Lands to a traditional community governing structure; and
- these rights are provided without a time limit.

The first KdTI area is in the heartland of the Krui damar agroforests in Lampung Province on the Indonesian island of Sumatra. These magnificent damar agroforests have been described in earlier issues of this magazine (*Agroforestry Today* 6(4):12-13; 8(1):8-10; 9(4):18-20). Through a process developed by the Krui people a century ago, these agroforests begin with land clearing (slash-and-burn) and planting of upland rice, which is followed by a succession of tree crops, including coffee, fruit trees, various timber species and damar (*Shorea javanica*), which produces resin as well as timber. These agroforests develop over a period of decades into complex, multi-strata agroforestry systems that replicate a number of forest functions, including biodiversity conservation and watershed protection. Satellite images indicate that there are approximately 55 000 ha of these mature agroforests in Krui. The new KdTI area covers 29 000 ha of damar agroforests at various ages that fall within the State Forest Zone, with the balance being on private land.

At the invitation of the Indonesian Minister of Forestry, ICRAF and non-government organization partners — the Tropical Nature Foundation of Indonesia, and the Family of Nature and Environment Lovers, Lampung — worked closely with Forestry Department counterparts to identify and develop workable options for implementing of the Minister's KdTI concept in Krui. This effort benefited greatly from previous research on the ecological, social and economic functions of the Krui

agroforests conducted by the Institut français de recherche scientifique pour le développement en coopération (ORSTOM) scientists, some of whom are seconded to ICRAF in Southeast Asia. Subsequently, a research consortium grew that includes the two Indonesian non-government organizations, the University of Indonesia, the Centre for International Forestry Research (CIFOR) and the ICRAF/ORSTOM team. Results of research by this 'Krui team' helped local farmers gain official recognition by documenting the myriad benefits of the damar agroforests as a resource management system. Since 1995, the research consortium has been working with Krui farmers to literally place their agroforestry systems on the map and to articulate the environmental and economic benefits of their system. Research and community organizations produced numerous maps and detailed descriptions and analysis of the Krui agroforests. In March 1997, the consortium conveyed requests from village leaders to the Minister of Forestry to begin a dialogue with government about the status of their lands. In June the consortium helped organize field visits from key government officials as well as a two-day workshop to present research results and discuss the status of the land. The results of these activities were reported to the Minister of Forestry and, six months later, the ground-breaking decree was signed.

The Krui experience has gained the attention of researchers working on similar problems as far away as Cameroon. African scientists visited the Krui agroforests as part of the activities of the Alternatives to Slash-and-Burn Programme and expressed interest in the details of the new classification in the hope that a similar process can be explored in Cameroon.

At least 7000 families in the KdTI area will benefit directly from the decree's official recognition of their rights. If this pilot effort is implemented successfully, the KdTI prototype may be applied in numerous other locations in Indonesia, with benefits for hundreds of thousands of households through poverty alleviation, improved resource management and reduction of social conflict. Indeed, this can be viewed as an effort by Minister Djamaelodin to address human rights issues arising from conflict over forestlands, as well as the pursuit of environmental objectives and poverty alleviation. Until this decree was issued, the Krui agroforests were at risk because of the uncertainty of farmers' tenure status in the State Forest Land.

One serious implication of this legal status was that a forestry company held the legal right to manage the area, including the possible harvesting of an estimated three million commercially valuable trees planted by local people, who in turn could legally be fined or jailed for establishing and managing their agroforests. In addition, local farmers expressed growing concerns over the uncertainty of their rights to the damar agroforests they had planted and are currently managing. Many damar farmers adopted a 'wait and see' strategy and chose not to plant damar and fruit trees until they knew for sure whether they would be able to harvest the benefits of their work. This uncertainty clearly endangered the very future of a system that is renowned worldwide as a rare example of successful and sustainable system for management of forest resources by a local community. Thanks to this new decree, damar farmers and their agroforests in the KdTI area should now be safe from such threats.