

# **Migrants in South Sumatra's forests : Development pioneers or destructive interlopers ?**

**Glenn Smith\***

A number of the articles in this volume deal with Indonesia's forests and the people whose livelihoods depend on them. The attention appears to be merited, for Indonesia's 13,000 islands comprise the world's second largest expanse of tropical rain forest. Yet, a study of deforestation appearing in a recent issue of *New Scientist* (31 oct 1998) suggests we may be overrating Indonesia's forests. Based on satellite imagery and field research, the authors of the study come to the conclusion that there is no hope of stopping deforestation by logging companies and farmers in Indonesia, and we would be best advised to drop efforts to save those forests and concentrate on areas which might still be preserved, notably in the Amazon Basin, the Congo, and New Guinea. The article singled out the Indonesian island of Sumatra as the hottest of the world's deforestation hot spots. This bleak picture applies not only to Sumatra or Indonesia. As Tim Whitmore of the University of Cambridge put it, "Southeast Asia has had it. There is little old-growth forest left there anywhere."

## **Migrants in South Sumatra**

Migrants, indigenous agriculturalists, and commercial planters and loggers were indeed engaged in clearing large areas of Sumatra's forest when the Spontaneous Transmigration Project sponsored research on

---

\* Laboratoire Asie du Sud-Est et Monde Austronésien (UPR 297), Centre A.G. Haudricourt, Campus CNRS, B.P. 8, 7 rue Guy-Môquet, 94801 Villejuif Cedex, France

migration in the province of South Sumatra in 1990-1991.<sup>1</sup> The project was aimed at collecting data on the movement and settlement of spontaneous migrants, those migrants who moved into the province by their own means, unlike those who came as part of Indonesia's official Transmigration program. In this century, the Transmigration program has resettled hundreds of thousands of Javanese, Madurese and Balinese in Sumatra and other outer islands, providing cleared land, housing and food aid while the migrants plant their first crops. The Transmigration program has been responsible for opening up vast tracts of mainly lowland forest. As for spontaneous migrants, they either purchase land from departing transmigrants, open forest lands on the periphery of the existing lowland sites, or clear forested areas in the foothills or mountains elsewhere in the province. In the lowlands, spontaneous migrants usually plant food crops and receive title to their land, while in the uplands they mainly plant Robusta coffee and have no title to their land. The older lowland settlements with irrigation works have been most successful over time, whereas many more recent frontier settlements have experienced depletion of soil fertility after several years of planting food crops. In the lowland forest margins, planting coffee, rubber, or other tree crops would often represent a more efficient and sustainable alternative to growing food. However, lack of sufficient infrastructures, off-farm employment opportunities, and agricultural extension services means that newly-arrived settlers without capital must adopt the short-term solution of planting food crops. It is ironic that settlers who clear forest to establish food-crop agriculture stand a better chance of receiving title to their land than settlers who elect to plant tree crops.

On billboards and in other government propaganda, migrants have long been praised as pioneers and even heroes for their role in spreading a message of Indonesian unity to the far reaches of the archipelago and for furthering economic development and national security interests. More recently, however, in the face of mounting international criticism of the Transmigration program, and raging forest fires on Sumatra and Kalimantan, migrants, particularly spontaneous migrants, have been singled out as destructive interlopers who illegally encroach upon public lands, and in doing so, wreak ecological havoc. In some cases, migrants are pointed to when indigenous shifting cultivators are accused of deforestation. Well-intentioned defenders of swidden farmers claim that by importing intensive agricultural methods from their home areas migrants do more damage to the tropical forest than indigenous farmers who use extensive shifting cultivation. This argument may be valid for many parts of the world, though it does not appear to hold for South Sumatra, at least not in the upland coffee-growing areas where the most extensive deforestation has taken place. As will be noted below, forest clearing by

---

<sup>1</sup> The Project was a joint effort of the Centre National de la Recherche Scientifique (CNRS), the Institut Français de Recherche pour le Développement en Coopération (ORSTOM) and the Indonesian Ministry of Transmigration, with funding provided by the World Bank (Special Studies, Trans V, Loan 2578-IND).

indigenous cultivators in South Sumatra often opens the way for more widespread deforestation by local and migrant populations, all of whom employ similar methods of land clearing and resource exploitation.

Migrants in South Sumatra undoubtedly share part of the blame for massive deforestation, the displacement or disappearance of most large animals including the Sumatran tiger and elephant, as well as a number of localized environmental degradations including landslides and erosion. Thus, it is not the aim here to present spontaneous migrants as “babes in the woods”, so to speak. Yet, quite often, migrants are singled out in order to counter suspicions that powerful commercial interests are responsible for environmental damage. The Indonesian government has never been very keen to criticize the actions of agricultural estates and commercial loggers who are well connected in the capital, and often with the former president Suharto’s inner circle. It should also be noted that, in many cases, migrants have cleared secondary forest resulting from earlier clearings of primary forest by indigenous or commercial cultivators.

In late 1997, when forest fires began to blanket much of Indonesia, including Sumatra, the government reaction was to blame migrant and indigenous agriculturalists for their practice of slash-and-burn land clearing, activities which coincided dangerously with the El Niño weather phenomenon. Following initial reports that many large-scale fires were being set intentionally by commercial interests, the government banned further reports of corporate misdoings. It was only in October, 1998, following the change of government in Jakarta and the lifting of some press and information restrictions, that the non-governmental Indonesia Forum for Environment (Wahana Lingkungan Hidup Indonesia, WAHLI) was able to convince the provincial court in South Sumatra that two out of eleven accused agro-industrial estates (PT. Inti Remaja Concern and PT. Musi Hutan Persada) were responsible for setting large-scale fires to clear forest land for conversion to palm oil plantations. A cursory examination of the maps of hot spots for South Sumatra in October and November 1997, available on the Internet,<sup>2</sup> also shows that many if not most of the fires originated within areas controlled by commercial agriculture and logging concerns. This is not surprising because indigenous and migrant smallholders generally slash and burn small parcels collectively, and thus have sufficient manpower on hand to keep the flames from getting out of hand.

### **The “Migrant’s-Eye View”**

Even when migrants are responsible for deforestation and ecologically-unsound practices, it is essential to consider the larger context in which

---

<sup>2</sup>“Hot Spot Propinsi Sumatera Selatan”, <http://www.bapedal.go.id/~poskodol/sumsel/>. Maps from this site for 1 and 31 October and 16 November 1997 were compared with the maps of land status in Durand and Pain (1993 : 285, 289 ; Fig. 42 : Institutional Constraints and Land Status, Fig. 43 : Agro-Economic Constraints).

they act. We need to understand the motivations and constraints which govern migrant decision-making on the ground, in essence, by adopting a “migrant’s-eye view” (Bogue 1977). Only then can their responsibility be correctly gauged, and, more importantly, only then can we seek workable solutions to the problems of tropical deforestation which take into account the welfare of local and migrant populations.

Migrant farmers have sometimes been called “Shifted Cultivators,” people forced off their land who resort to making homes and farms in the tropical forests. Our study of over 300 migrant households in South Sumatra found, however, that 80 % of the spontaneous migrants were not landless but rather land-poor peasants before coming to South Sumatra (Smith and Bouvier 1993). Of the migrants interviewed, only one in five was landless in his or her village of origin, though half possessed or expected to inherit less than 0.25 hectare. Migration is a high-risk enterprise, thus landless families can rarely afford to cut their ties in their home villages. Having even a small land holding enables one to employ certain strategies to minimize the risk of failure. The husband or son can be sent to seek information on settlement options before committing the whole family to a move. Significantly, the house and land in the village of origin can be retained. For the most part, the migrants we studied were not forced off their land. They chose migration as part of a family strategy (see Schaeffer 1987) to improve their welfare. Life histories also indicate that migrants usually formulate their settlement strategies by carefully evaluating the alternatives available to them rather than by hastily reacting out of desperation.

These migrants went to Sumatra for a number of reasons. They came in search of sufficient land for raising a family, higher wages or at least more regular employment than was available in their home villages. Some were hired in Java to come work on public works projects, building roads, for example, or as laborers in commercial plantations, and decided to stay on after their contracts had ended. Interestingly, many of the younger migrants claimed they sought a relatively isolated place where the limited opportunities for spending money could enable them to save most of what they earned. Though most of the migrants did not come on contract, and had just enough cash with them to pay the journey and a few days’ meals on arrival, they had a fair idea of what lied in store for them. Over three quarters had an address of family or acquaintances with whom they could stay or obtain work.<sup>3</sup>

Some came with the intention of settling down in Sumatra, others with a plan to build up capital to be brought back and deployed in the village of origin. Migration decisions, however, are dynamic processes in which migrants are constantly reevaluating their options, as they perceive changes in the cost-benefits of alternative strategies. Most would probably elect to stay in Sumatra if they could find economic security in commu-

---

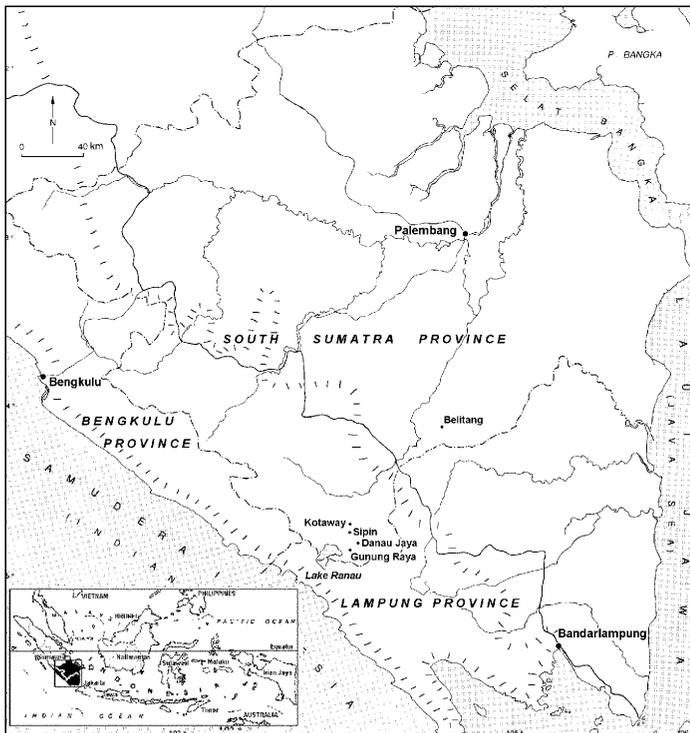
<sup>3</sup>The importance of family or co-villager sponsorship, and information provided by migrant returnees has been noted elsewhere (Fuller, Kamnuansilpa and Lightfoot 1990 ; Sripraphai and Sripraphai 1983).

nities with sustainable productive systems and adequate infrastructures. Unfortunately, the institutional context does not always allow for the development and long-term survival of such communities.

### Processes of Expansion into Lowland Forests

Take, for example, the process of forest clearing on the periphery of official Transmigration settlements in the lowlands around Belitang (Carte 1), which date back to the 1930's. Originally, the Transmigration settlements were built around a core area that was cleared for the first settlers. Reserve land on the periphery was set aside for their household expansion. In many cases, however, this reserve land was (and still is) sold by the settlement administrators to spontaneous migrants at market value. This practice has the predictable effect of drawing new migrants able to purchase the reserve plots, while forcing the children of the original settlers to look elsewhere for available land. The result is increased pressure on the forest fringes.

Carte 1 : Southern Sumatra : location of sites mentioned in the text.



The need to provide for family expansion can result in the creation of new settlements which expand well beyond the Transmigration core area and reserve land. Individuals or groups of families can petition the district head for authorization to open new land. The founder and first residents of such settlements come from nearby settlements opened earlier, but village and district heads actively seek to augment the population rapidly, often through direct recruitment of new settlers in Java. This is because reaching the mark of 250, or in some cases, 500 families makes the village eligible for development aid in the form of roads, schools, health clinics, or marketplaces. Indigenous Sumatran villages also try to augment their population to qualify for this aid. It is not unusual for a small village to recruit over a hundred families at one time fleeing unproductive land or land being vacated to create a forest reserve elsewhere in Sumatra. Offspring from the lowland areas may find land in these areas, others may look for seasonal employment in highland plantations or join in the clearing of new plantations in the highland forest.

### **The Expansion of Upland Coffee Cultivation**

In various parts of the highlands, coffee, pepper, rubber and other crops have been planted by indigenous as well as commercial planters since the colonial period (before 1949). Since the mid-1970s, there has been an accelerated movement to clear the highland forest to plant coffee. Periods of greatest deforestation have coincided with high coffee prices on the world market. By 1990, only the upper elevations and steepest slopes in the highlands were still under forest cover. An evolution in transportation accompanied this colonization of the hills. Prior to 1980, porters brought coffee down from the plantations and brought supplies up. Horses replaced porters, and in 1985, trail motorcycles began to replace horses. Motorcycle transport hastened the clearing of many remaining forest patches, and planters became increasingly dependent on them for their daily needs and for contact with the outside world (Figure 1).

Two patterns of forest clearance have characterized the growth of coffee planting in South Sumatra. One pattern is for clearings to be made on the periphery of existing plantations or indigenous villages. Many indigenous villages in the highlands are located along river valleys where rice cultivation provides the economic base, while coffee is cultivated on the adjacent slopes. As yields decline, coffee prices rise, or labor becomes more available, these clearings are further extended.

A second pattern of forest clearance that has been observed is for a group of local Sumatrans, most notably people from the Semendo ethnic group, to go deep into the forest to seek ideal spots for planting coffee.

Figure 1 : Motorcycle transport in pioneer plantations near Danau Jaya  
(drawing by Y. Why from photo by G. Smith).



Besides the fact that the Semendo have an intimate knowledge of local conditions, their social structure encourages migration. According to Semendo inheritance practices, the house and rice paddies are transferred entirely to the eldest daughter, who takes care of her parents in their old age. Men who cannot obtain land and house through marriage must make a living from coffee cultivation. When land near their home villages becomes degraded, a group will sometimes set off to colonize a distant area of forest.

A group of 10 Semendo men, for example, traveled 50 km from their home village in 1977 to open the forest between the two long-established plantation areas of Gunung Raya (near Lake Ranau) and Kotaway-Sipin. They chose an area of high plateau with a small lake, and named it Danau Jaya. Working collectively, the settlers opened up enough forest to provide themselves each with one to four hectares of land suitable for upland rice and coffee. The Semendo received additional aid from their home villages before the rice harvest. Some Javanese, servants from the Semendo village, were brought along to help establish the settlement. They cleared land of their own, and spread the word to others back home who would later come join them or open similar settlements nearby.

The system used by the Semendo and others who have cleared forest in this area is to plant rice once the big trees have been removed, and one to three months later plant coffee seedlings. By and large, migrants have

adopted local practices for the cultivation of coffee. The settlers receive aid from family or rely on their own capital until the rice is harvested. Much primary and secondary forest has also been cleared by small groups of men (*kungsi*) working collectively, and receiving subsistence aid from a “landlord” who was able to obtain the authorization to clear forest. A group would clear and plant, for example, 8 ha, 4 of which would be given to the “landlord” and the remaining 4 ha divided evenly among the members of the group. After one or possibly two rice harvests, the shoots are removed and the coffee left to grow on its own. At four years of age, the coffee provides a bumper harvest (*panem agung*). In frontier plantations, the yield falls drastically in the following years since fertilizer and shade trees are rarely used. Some trees eventually degenerate and die from overbearing dieback, a condition caused by inadequate shade and fertilizer. Most settlers simply use pruning (*memudahkan*) to rejuvenate their trees following the bumper harvest.

Figure 2 : Drying coffee beans in Danau Jaya village in 1990  
(drawing by Y. Why from photo by G. Smith).



To reach the Danau Jaya settlement in 1977, the Semendo had to walk 9 to 12 hours through the forest. By 1990, the forest between the two long-established plantation areas was entirely filled in by small-holder coffee plantations as far as the eye could see, due to expansion on the two older fronts and of the Danau Jaya deep-forest settlement (for a view of the core village in 1990, see figure 2). Near Danau Jaya, there are predominantly Javanese settlements, settlements where Sumatrans from the Semendo,

Kisam, Komerling or other groups are in the majority, and settlements where the proportion of migrants and locals is about equal.

Today, land can only change hands through the buying and selling of plantations. The prices depend on the intrinsic value of the plantation, the accessibility of the site, and whether or not land tenure documents can be obtained. Land ownership papers are not available for most of the recently cleared forest sites, thus the constant concern of settlers is the possibility of someday being expelled.

### **Settlement Authorization and Protected Forests**

As in the lowlands, authorization for many of the early upland clearings, including the deep-forest Semendo settlement, were received from sub-district officials, and sometimes from the highest district authorities. Although official declarations call for a moratorium on forest clearing and the creation of natural reserves, on the provincial and local levels forest clearing generates wealth, at least in the short term. Settlers in the protected areas pay land taxes, despite the fact that they have no hope of obtaining legal title to their land. Migrants in such places also pay "protection" money. Migrants we talked to spoke of various sub-district or police officials roaming the hills demanding money from them to be used, so they claimed, to bribe higher-ups so the settlements could remain. A struggle apparently exists over forest policy between district, provincial, and national officials. When smallholders cut down forest to plant coffee, most of the wealth thus generated circulates locally or at least in the province. When forest concessions are given to loggers and commercial planters, however, the bulk of the wealth is channeled out of the province to the capital. On several occasions, migrants told us that local authorities had ordered them to clear the remaining patches of forest in their area.

Considerable ambiguity exists over the creation of forest reserves. In 1990, few officials or settlers could state unequivocally which areas were to be set aside as reserves. Government maps of forest status are imprecise, often differ from one bureau to another, and are not communicated widely (Durand and Pain 1993 : 300). Enforcement of the boundaries stipulated on the maps is usually lax but at times can suddenly become heavy-handed. In several areas, settlers have been forcibly evicted with little or no notice given, thus all settlers without legal title to their land live in anticipation of a similar fate. Many long-established indigenous villages fall within areas slated for conversion to protected forest. Where such insecurity exists, migrant and indigenous planters are inclined to reason that they must get what they can out of their land before they are forced off. This attitude was voiced in many interviews with settlers. It seems as if local

and regional leaders reason that if the forest can be cleared first, perhaps there will no longer be any basis for creating a forest reserve. At least that would explain their desire to clear remaining forest patches.

As we recall, most migrants in our study were coming to Sumatra to find a better life for themselves and their families, but a return to their village of origin remained an option. If the situation they find in migration is one of insecurity, hardship and isolation characterizing the frontier settlements, it is not surprising that they select short-term strategies in the expectation of a future return to their home villages. Cutting the forest may be the only means available to them for meeting their goals.

Unfortunately, within the current institutional setup, a settler who manages to be among the first to clear forested land is often playing a winning strategy. Given the ambiguity over forest status, and the inertia of local authorities, settlers with enough capital to open forest and plant coffee can reasonably expect to remain long enough to obtain a bumper harvest. With a little luck, before the risk of eviction becomes immanent they can sell their plantation for a handsome profit. They then have the option of buying titled land in a "safe" area or take the risk of opening new forest elsewhere.

## Conclusion

Preserving what remains of South Sumatra's forests will depend on transforming existing settlements into sustainable communities. Settlements carved out of the forest for coffee planting can, in fact, develop into stable communities integrating food crop agriculture with home gardens and tree crops. Sipin village, for example, near Kotaway, has some older neighborhoods first settled in the 1940s. Residents have legal title to their land, and one finds the usual amenities of an Indonesian village (such as road access, small shops and primary schools). Sipin also includes dispersed settlements in the upper elevations opened in the 1970s and 1980s, where legal title is unavailable. Distinct differences in economic behavior characterize each area. In the upper hilly areas, settlers adopt an attitude of temporary residents practicing coffee monoculture, and seeking short-term returns. The older part of the village, however, has evolved to where more long-term strategies can be adopted by residents. With their land tenure secure, they have diversified beyond a strict dependence on coffee to include pepper, rubber and cloves among their cash crops, and they also plant food crops and maintain home-gardens. Since their income is derived from a variety of sources, they can stock their coffee harvest and sell when market conditions are favorable.<sup>4</sup> In Sipin and similar communities, planters are much more

---

<sup>4</sup> Diversification among coffee small holders in another part of South Sumatra Province is discussed by Godoy and Bennett (1988)

likely to use fertilizer, pruning, shade trees and mulching as tools for intensifying production while protecting the landscape.

Secure land tenure thus emerges as a primary condition for the development of diversified communities based on sustainable production systems. Similarly, the policy on forest reserve creation needs a thorough revamping in order to take better into account the human dimensions. Finding a way out of the current disarray will imply giving indigenous and migrant communities the right to participate in the critical job of remapping land status and use. Protected forest areas which no longer contain forest, for example, could be redesignated as production forests and control over their use transferred to the local people who would receive secure title to their land. In exchange, local communities could be expected to contribute to more effective monitoring and enforcement of mutually agreed-upon protected forest boundaries. People with legal ownership of their land are also more likely to adopt soil and watershed conservation techniques to the extent that they are able to benefit over time from the required investments (Batie, 1986 ; Napier, 1991a, 1991b). Furthermore, should not local groups be allowed to bid on and acquire forest concessions, and receive loans for this purpose as do commercial ventures ? Though the prospects are slim that these changes can be adopted soon amid the current political and monetary instability in Indonesia, the fate of the last remaining forests in South Sumatra decidedly hangs in the balance.

## BIBLIOGRAPHY

BATIE S., 1986, Why Soil Erosion : A Social Science Perspective, in *Conserving Soil : Insights from Socioeconomic Research*, Lovejoy, S.B., Napier, T.L., eds, Soil and Water Conservation Society of America Press, Askeny, Indiana, pp 3-14.

BOGUE D. J., 1977, A Migrant's-Eye View of the Costs and Benefits of Migration to a Metropolis, in *Internal Migration : A Comparative Perspective*, Brown, A.A., Neuberger, A., eds, Academic Press, New York, pp 167-182.

DURAND F., PAIN M., 1993, Regional Policies and Management of the Environment, in *Spontaneous Settlements in Indonesia : Agricultural Pioneers in Southern Sumatra*, Charras, M., Pain, M., eds, ORSTOM, Paris, pp 281-305.

FULLER T.D., KAMNUANSILPA P., LIGHTFOOT P., 1990, Urban Ties of Rural Thais, *International Migration Review*, 24, 534-562.

GODOY R., BENNETT C., 1988, Diversification among Coffee Smallholders in the Highlands of South Sumatra, Indonesia, *Human Ecology*, 16, 397-420.

NAPIER T.L., 1991a, *Property Rights and Adoption of Soil and Water Conservation Policies for Sustainable Hillside Farming*, Conference paper, Solo, Indonesia, 20 p.

NAPIER T.L., 1991b, Factors Affecting Acceptance and Continued Use of Soil Conservation Practices in Developing Societies : A Diffusion Perspective, *Agriculture, Ecosystems and Environment* 36, 127-140.

SMITH G., BOUVIER H., 1993, Spontaneous Migrant Strategies and Settlement Processes in the Plains and Mountains, in *Spontaneous Settlements in Indonesia : Agricultural Pioneers in Southern Sumatra*, Charras, M., Pain, M., eds, ORSTOM, Paris, pp 101-175.

SRIPRAPHAI P., SRIPRAPHAI K., 1983, Migration in Thailand : A Social, Eco-Psychological Approach. *Ethnologica Helvetica*, 7, 205-224.

## Résumé

### **Les migrants dans les forêts de Sumatra-Sud : pionniers du développement ou intrus destructeurs ?**

Les feux de forêts de 1997 en Indonésie, qui ont réduit en fumée une grande partie de la région, nous ont rappelé la fragilité des forêts tropicales. On a lié le désastre aux activités de défrichage des agriculteurs locaux et des planteurs migrants, ou encore aux intérêts industriels et de l'exploitation forestière, en interaction avec le phénomène El Niño. En Indonésie, ceux qui migrent vers les régions forestières ont de longue date été associés à la déforestation, à l'érosion des sols et aux autres formes de dégradation du milieu. Comme dans le cas des intérêts industriels, leurs actions sont concentrées sur des défrichements fixes et permanents, donc plus faciles à repérer que celles des agriculteurs indigènes. Etant donné qu'il est virtuellement impossible, en Indonésie, de critiquer les activités des entreprises forestières bien établies, les migrants pauvres sont un bouc émissaire pratique pour des problèmes d'environnement, un paradoxe dans un pays qui a l'un des programmes de transmigration les plus ambitieux du monde afin d'encourager la migration vers les zones faiblement peuplées.

Dans le Sud de Sumatra, une grande part de la couverture forestière d'origine a été transformée à des fins agricoles par des générations de migrants venus de Java et d'ailleurs. Cet article traite des motivations de ces migrants, des communautés qu'ils y ont créées et de leur impact sur l'environnement, ainsi que du contexte politique et économique dans lequel se forment les stratégies de migrations. L'auteur arrive à la conclusion que les récentes politiques de gestion des forêts, en ce qui concerne le droit foncier et la création de réserves, par exemple, décourage le développement de communautés durables de migrants et encourage au contraire les individus à adopter des stratégies à court-terme et écologiquement destructrices.

# Travaux de la Société d'Écologie Humaine

Directeur de la Publication : Nicole Vernazza-Licht

Déjà parus :

*L'homme et le Lac, 1995*

*Impact de l'homme sur les milieux naturels : Perceptions et mesures, 1996*

*Villes du Sud et environnement, 1997*

*L'homme et la lagune. De l'espace naturel à l'espace urbanisé, 1998*

Cet ouvrage trouve son origine dans les X<sup>e</sup> journées scientifiques de la Société d'Écologie Humaine (Marseille, novembre 1998) organisées par la SEH, le programme Avenir des Peuples des Forêts Tropicales et l'UMR 6578 du CNRS-Université de la Méditerranée. Elles ont bénéficié de l'appui du programme "Environnement, vie, sociétés" du CNRS et du Département "Environnement, technologies et société" de l'Université de Provence.

Les éditeurs scientifiques tiennent à remercier : Patrick Baudot (Université de Provence, Marseille), Edmond Dounias (IRD, Montpellier), Alain Froment (IRD, Orléans), Annette Hladik (CNRS, Paris), Annie Hubert (CNRS, Bordeaux), Pierre Lemonnier (CNRS, Marseille), Glenn Smith (LASEMA, Paris) et Theodore Trefon (APFT, Bruxelles) pour leur aide précieuse dans la relecture de certains manuscrits.

Cet ouvrage a été publié avec le concours financier de l'Union Européenne (programme APFT, DG Développement) et du Conseil Général des Bouches-du-Rhône.

*Les opinions émises dans le cadre de chaque article n'engagent que leurs auteurs.*

**SOCIÉTÉ D'ÉCOLOGIE HUMAINE**

c/o UMR 6578 du CNRS-Université de la Méditerranée

Faculté de Médecine, 27, boulevard Jean-Moulin

13385 Marseille cedex 5

Dépôt légal : 2<sup>e</sup> trimestre 2000

ISBN 2-9511840-5-0

ISSN 1284-5590

*Tous droits réservés pour tous pays*

© Éditions de Bergier

476 chemin de Bergier, 06740 Châteauneuf de Grasse

bergier@wanadoo.fr

# L'HOMME ET LA FORÊT TROPICALE

**Éditeurs scientifiques**

Serge Bahuchet, Daniel Bley,  
Hélène Pagezy, Nicole Vernazza-Licht

Travaux de  
la Société  
d'Ecologie  
Humaine



1999