

III – Managing wild resources:



Hunting, gathering, and extractivism in natural forests and on farmlands

1. How does indigenous forest management integrate extraction activities?

Extraction concerns the collection and utilization of natural stocks of forest resources. Extraction per se does not constitute a management system, but, embedded in local frameworks of representations and beliefs, knowledge and practices, customs and institutions, it refers to three broad categories of forest management: timber extraction by logging firms, hunting and gathering by local communities, and ‘extractivism’, or the extraction of NTFP by individuals or small-scale entrepreneurs for trade⁽¹⁾.

For centuries, people of tropical rainforests have been collecting wild forest resources for their subsistence. In South-east Asia, subsistence gathering is still important. Hunting, fishing and the gathering of plant foods and medicines still provide an important part of the diet and health system of rural people in the region, and the forest still provides essential plant material for household use—leaves, lianas, resins and latexes, bark and palm fibres as well as timber and firewood. Besides collecting forest resources for subsistence, rural people also visit the forest to get cash. In South-east Asia, collection for trade (extractivism) represents an important branch of forest gathering. Extractivism is not a new practice in South-east Asia, as it emerged as far back as the prehistoric period with the development of inter-island exchanges based on animal products and resins⁽²⁾. It slowly flourished and became the main economic activity in the region with the development of first Chinese, then Hindu and Arab trade routes. Products traded ranged from parts of animals (bezoar stones, birds’ nests, rhino horn) to spices and resins for medicinal and ritual purposes (benzoin, camphor, eagle wood). Colonial trade with Europe gave a new dimension to extractivism, first with spices (cinnamon, cloves, nutmeg, pepper), then with raw material for industries, especially resins (copal, damar, turpentine) and latexes (gutta percha, rubbers)⁽³⁾. Since World War II, many of these products have lost their economic importance, and the present extractive economy in the region has developed around two important poles: rattan, which represents the largest forest activity, in volume and benefits, after timber; and luxury products like birds’ nests and dragon’s blood (eaglewood)⁽⁴⁾. Collection of natural chemicals for the pharmaceutical or insecticide industries is emerging as a promising industry.

We have encountered extractive activities for either subsistence or trade in all the study sites of the project. ***Extraction is not a uniform strategy throughout the study areas, but is adapted to the structure of the local farming system, to market and policy imperatives and to the individual and collective strategies of local communities.*** Various

1. Fearnside 1989, Allegretti 1990, Salafsky *et al.* 1993.

2. Dunn 1975.

3. Michon & de Foresta 1997.

4. Sellato 2004.

categories of people engage in extraction for a variety of reasons and in various ways. The impact on the ecosystem or on particular resources is also highly varied, as are the social and economic consequences. However, in all cases, *these activities are not exclusive, but are integrated into agricultural and other activities*. In many cases, *these activities are not carried out exclusively in natural forests, but also (sometimes almost exclusively) on agricultural territory, in predominantly anthropogenic or cultivated vegetations*. How does this integration occur, especially within household and village economies? How do forest activities and agriculture relate? What are the important points of these complementarities between forest collection and collection on farmlands? How far do rural people of the twenty-first century still depend on ‘wild’ resources?

Various ways: Even if it is impossible to draw a single general model of forest extraction for the region, some general tendencies have been analysed:

- There is a *continuum of activities* between a ‘generalist model’, implying regular and diversified, multipurpose activities, and a ‘single-focus model’, where the forest is exploited for a particular product or to meet a particular need. The generalist model is now uncommon as a dominant mode of production and mainly concerns people living in deep forests with rudimentary swidden cultivation systems (Punan in East Kalimantan and Talang Mamak in Sumatra, as exposed further in this chapter). Traces of it can still be found in most rural areas, however, where collection of wild plants, hunting and fishing are still practiced either regularly or seasonally as a complement to regular agricultural activities. Single-focus extraction is more frequent, either regularly or sporadically, and often co-exists in a given society with the generalist model. For example, nomadic Punan in East Kalimantan combine generalist harvesting for sago, game and fruits and specialized extraction of commercial products as a source of cash income.
- There is a general, and ancient, tendency to *cultivate and domesticate* interesting products (on this particular point, see Michon *et al.* 1998). Domestication has been achieved in a long process over the last centuries for most of the local fruit species, for sago and sugar palms as well as for internationally traded spices (cinnamon, clove, nutmeg, pepper). More recently, the cultivation of key commercial forest products such as small cane rattan, benzoin, damar and rubber in restored forestlike gardens has fostered a semidomestication process (as we will abundantly detail in this volume). New attempts for local domestication are being developed nowadays with birds’ nests (see this volume), large cane rattan, and timber (see this volume).

A variety of reasons: From an economic point of view, forest extraction can be characterised as follows:

- Local people usually maintain forest harvesting, especially commercial extraction, by choice rather than by necessity. Even for poor and isolated forest dwellers the practice is considered an alternative or complementary option in the economic portfolio, and it is developed in different types of livelihood strategies. Forest extraction is usually opportunistic (i.e., practiced when it is considered more profitable than other options). The importance



The meadow of the sagu palm provides starches.



The forest is often the main provider of protein foods like game and fish.



Forest fruits in South-east Asia exhibit an astonishing variety.

Durio kutejensis



Wild honey is an important traditional forest food.



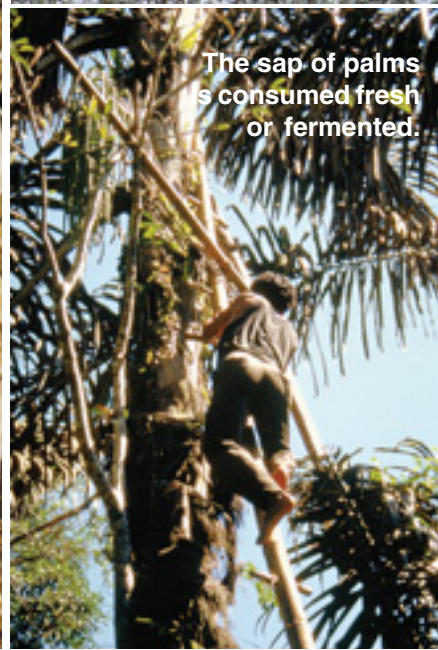
Mangifera sp.



Dialium sp.



The forest provides vegetables, here bamboo shoot.



The sap of palms is consumed fresh or fermented.



The forest provides material for building . . .

Harvesting for subsistence



. . . and for daily-use handicraft, here rattan



Extractivism is indifferently practised in the forest (rattan palms, left) and in open vegetations (alang-alang grass, right).



Forest extraction for trade

Extractivism concerns low value species (leaves for mat weaving, above) as well as high value products (sandalwood, middle, and gold, below).



Extractivism concerns products traded for centuries (like damar resins, left) as well as 'new' products for emerging markets, like the tree fern (right) for urban horticulture.



given to forest extraction usually varies along the life cycle and the social category of the household.

- In shifting cultivation areas, subsistence harvesting represents the main source of food (except for staples) during the swidden season, providing protein (fish, game) and vitamins (fruits, vegetables). It also represents an important source of building materials and materials for productive activities and home handicraft.
- Forest extraction for commercial purposes represents an important starter or transitional activity for bachelors or newly established households with little patrimony. In areas where the management of a cultivated forest represents the main activity, extractivism brings cash income during the few years between the plantation of the forest plot and the first harvest.
- Extractivism is used by some farmers as a strategy for capital accumulation, especially with high-value products such as eaglewood, logs and large cane rattan.
- For the majority of farmers, commercial extraction represents either an additional or a seasonal source of income, which is particularly useful in times of agricultural recession. Social and economic welfare is not usually achieved through forest collection, but mainly through forest cultivation. In other words, the majority of people do not get rich if they stick exclusively to extractivism.
- The importance of forest products in the economic life of households has in most areas declined during the last 20 years, reflecting new economic opportunities (better market access, temporary migration, wage labour, commercial agriculture or forest product cultivation) and farmers' negative perception of forest-related activities.
- Nevertheless, forest extraction and cultivation still represent a major source of livelihood and survival in times of crisis, as illustrated by farmers surviving the 1997–1998 drought and associated economic crisis thanks to the forest (as illustrated in chap. II section 6 for Muara Bungo; see Clément *et al.* 1998; Clément 2000).

Various categories of people: The degree of involvement in forest collection varies among social groups.

- It is mostly women who carry out the collection of subsistence products. Men preferably engage in hunting, wood cutting and commercial collection.
- Commercial collection involving long expeditions deep into the forest is preferentially practiced by
 - strong bachelors who prefer forest collection over migration or wage labour in order to obtain sufficient capital to start their own enterprise or establish their own household
 - specialized or professional collectors, who permanently or temporarily set aside their agricultural activity. They usually collect illegal products (e.g., timber or tiger skins) or products that require a certain knowledge or *savoir faire* such as dragon's blood, eaglewood or fish.
- There is strong competition between local collectors and outsiders, especially for high-value products such as birds' nests, eaglewood and timber. Nontraditional products are usually collected by outsiders, as local people ignore or

are unaware of the market niche. (In Riau, nontraditional products targeted by outsiders include turtles and singing birds.) Local farmers may join in the collection of these nontraditional products, but when they do so, the resource is already declining. This kind of nonlocal extractivism is almost always unsustainable and conducted in a 'collect and run' style.

Various dynamics and various impacts: The evaluation of the impact of subsistence gathering and extractivism on the ecosystem depends on the type of activity considered and on the scale (in space and time) at which the analysis is carried out. Broad conclusions can be drawn, however, on global dynamics of forest extraction in the region.

- Extraction for subsistence purposes is usually quite sustainable, having little negative impact on individual resources and the ecosystem because demand for subsistence products is relatively low compared with the availability of the targeted resources. In times of crisis, however, the impact may become temporarily negative as pressure on wild foods and materials increases. As long as crises occur far enough apart in time, individual resources generally have time to regenerate.
- Extraction dynamics linked to extractivism are often destructive for the targeted resource (as illustrated further for the Toba Batak highlands). In boom periods, incentives for harvesting as much as possible (immediate profit, competition with outsiders, abuse of power by external authorities towards local collectors and related fears of being evicted) are obviously higher than incentives for sustainable management. This pattern is strongly correlated to the highly fluctuating and fleeting nature of external demand for forest products conveyed by outside traders, e.g., a given product may be in high demand one day, having not been a few days earlier, and then a few months later is reduced to its valueless state once again. Uncertainties introduced by abrupt changes in policies, such as the imposition of concessionary or auction systems for, say, the exploitation of edible birds' nests, or the creation of a unique buying body (as the buying system established for rattan in the late 1980s) often appear when a product gains in value. They may deeply affect prices paid to producers and lead to the collapse of the collection, as we will illustrate for birds' nests. Farmers react to this uncertainty by maximising the profitability of extraction, setting aside any long-term concern for sustainability, as there is no related intrinsic sustainability in the market.
- Nevertheless extractivism, considered an economic activity made of a succession of collecting booms targeted at individual resources that change in time, appears to be quite sustainable over long periods of time. From the times of early trade in forest products until now, extraction for trade has persisted as a profitable economic activity with the permanence of a large stock of forest resources.
- The main threat to the future of extractivism is not the rate at which the activity is carried out, but the present forest conversion to non-forest uses.
- Timber extraction (usually illegal) for local sawmills has boomed since 1996 (as observed at all Indonesian locations). It tends to replace all the other extractive activities where it develops. The observed rates of log extraction lead us

to conclude that this activity is highly unsustainable. All the valuable species are collected, independently of their diameter, and the most valuable have already gone.

- Extraction dynamics are mainly determined by traders' strategies and by government policies.

Conclusions

1. In any support programme, forest extraction as a management system should be considered for the long term and in a global environment relating local dynamics to national and international market and policy trends. The global tendency of present extraction habits for trade is to be unsustainable in the short term, but to remain globally sustainable in the long term. As an economic strategy, 'extractivism' is maintained as long as the forest itself exists. It is therefore more important to foster the maintenance of a diverse forest that can be used in a flexible way than to base a project on the extraction of a unique product, and to work on a policy environment that would give more incentives for sustainable management of individual resources.

2. The complementarity between forest and agriculture is still essential in all rural areas where farmers do not have enough capacity for income accumulation and are still quite exposed to risk. To retain this forest–agriculture complementariness, it is essential to maintain patches of natural forests or enough 'wild' or forestlike spaces on farmlands (i.e., niches for wild plants in cultivated spaces), especially until other strategies can be used on farmlands.

2. Is the concept of extractive reserves as developed in the Amazon region useful in the South-east Asian context?

Extractive reserves are large areas of undisturbed forest given in long-term concession to indigenous communities for the exclusive practice of extractivism and forest collection for subsistence⁽⁵⁾. Conversion to agriculture is strictly controlled. It is usually forbidden, or at best restricted to the development of small home gardens around dwellings. The benefits of extractive reserves are twofold: they serve as conservation areas, while allowing local communities to retain their authority over the protected forest and to draw their subsistence and cash from it.

Can conservation areas of this type be conceived in the South-east Asian context?

Our conclusion is that several factors linked to the reality of forest extraction in the area render the Amazon model quite undesirable from the point of view of local communities.

- Unlike that reported from the Amazon region, and in contrast to large-scale timber harvesting, forest harvesting practiced by local people in the region is not a standalone activity. It is always associated with one form or another

5. Allegretti 1990

of farming (sedentary or shifting cultivation) and cannot be dissociated from the management of tree gardens and planted forest resources. Complementarity between extraction and farming concerns economic as well as social and cultural fields.

- Collection of wild products is not restricted to areas of primary forest, as already mentioned. A large part of the activity, and especially generalist harvesting for subsistence, is practiced close to the villages, in secondary forests, fallows, field borders and roadsides or in plantation forests established by the farmers themselves. Extraction patterns and purposes vary with each vegetation type. Primary forests are mainly visited for the collection of commercial products, and extraction practices tend to be quite unsustainable because of a combination of economic reasons (quick market and traders dynamic) and policy factors (conflicts in the public forest domain between locals and outsiders). Forest gardens and fallow vegetation are the main providers of plant material for domestic uses and of plant foods. Collection is more careful and therefore more sustainable.

For these first two sets of reasons, extractive reserves in the region should accommodate large areas ‘disturbed’ by local farming activities and allow the evolution of these farming areas.

- The management of forest resources in the wild is governed by the superimposition of national forest regulations over local customary systems. The establishment of logging concessions, conservation areas and, more recently, large-scale industrial plantations has displaced ‘traditional’ extraction dynamics. Industrial projects do affect farmers’ access to the wild resources, and farmers perceive the restrictions imposed upon their forest collection activities in a highly negative way, which has a direct negative impact on their respect for customary as well as national rules.
- The growing importance of outsiders in the collection of valuable forest products increases this perception. The main consequence is that most of the commercial collection is not governed by any regulation—or by any ethics. More recently, the fear that most of the forest will be either converted to non-forest uses or set aside for strict conservation, with the probable exclusion of local people in either case, or that outsiders will anyhow capture most of the benefits of forest resource exploitation, combined with current economic and political uncertainty, has led local people to either plunder their resources or sell them at the best price to outsiders.

For the last two sets of reasons, local customary systems concerning forest management, including the strict control of outsiders, should be acknowledged and enforced.

Conclusions

Under these conditions, it seems unlikely that the much discussed concept of ‘extractive reserve’ can be of any relevance in the region, whether in Indonesia or the Philippines. Compared to the Amazon, the remaining large tracks of forested areas in the region are much coveted by all kinds of actors who interact with different types of management

practices and purposes to the detriment of sustainability. We do think that hopes for sustainable forest management can come from the local models of forest domestication and cultivation rather than from extraction systems.

3. The history of forest extraction dynamics in the Bulungan regency, East Kalimantan: from the unsustainable extraction of individual resources to the sustainability of extractivism as a whole

Bulungan is the main NTFP producing district in East Kalimantan Province. (For a history of NTFP trade in East Kalimantan, see Peluso 1983; for a critical analysis of NTFP extraction in Bulungan, see Sellato 2001.) Extractivism in Bulungan is characterised by a superimposition of various dynamics related to individual products. The sustainability of these dynamics depends primarily on the biological characteristics of the resource as well as on market constraints. According to our analysis⁶, extraction dynamics are determined by two combined sets of criteria, defined as follows.

1. Criteria related to fluctuations of external demand over time, defining the degree of permanency of the practice, fall into three broad categories:
 - activities that have steadily survived over the last decades
 - activities that appeared (or boomed) recently
 - activities that did not survive or hardly survived because of market displacement for the product
2. Criteria related to the intensity of the collection practice and its impact on the renewal of the resource, fall into three broad categories:
 - activities leading to the (local) exhaustion of the resource or even the extinction of the species
 - activities leading to cyclical reduction in resource availability
 - activities allowing the conservation of the resource

The combination of these two sets of criteria allows for the definition of several striking extractive dynamics.

1. Extraction driven by constant demand and resulting in species extinction

The best example of collection for trade that led to extinction of the species is that of the *rhinoceros horn*. Rhino (*Rhinoceros sumatranus*) horn for the Chinese market was, for centuries, one of the most valuable forest products in Bulungan as well as all over Java, Borneo and Sumatra. Increasing rates of extraction compounded by the slow reproduction dynamics of the animal has made the species reportedly extinct in Borneo over 40 years ago.

6. Katz *et al.* 2002.

The other highly valued animal product traditionally traded with China for which the constant increase in demand is threatening species survival is *bezoar stones*, collected in the bladders of monkeys (*Presbytis hosei*) and porcupines (*Hystrix brachyura*).

2. Extraction stopped by lack of market

Many of the traditional products of extractivism in Borneo are not collected anymore, not because they are rare or scarce, but because their market has failed.

Camphor is an oleoresin from the tree *Dryobalanops aromatica*. It used to be a luxury product exported to China, India and the Middle East since the sixth century⁽⁷⁾ and harvested in a sustained way for at least 10 centuries, in spite of drastic collection methods (the tree must be felled). International demand increased during the course of the nineteenth century, threatening the very existence of the species in Borneo, but before any solution was found, Bornean camphor was partly replaced by Chinese camphor (*Cinnamomum camphora* and *Blumea balsamifera*, produced in a more sustainable way through cultivation in China). But by the end of the 1930s, *Dryobalanops* had already become more important for timber than for camphor. (Camphor wood is one of the three major timbers in Kalimantan.) Some camphor was still exported from the area until 1980, but quite likely it came from loggers, not local collectors.

The collection of *gutta percha* (the latex from *Palaquium* spp. and *Payena leeri*) stopped not because of the replacement of the wild species in Borneo by trees cultivated elsewhere, but because of the displacement of the market by a substitute resource. *Gutta percha* used to be an essential coating for European submarine cables. Between 1840 and 1915, it was the main product extracted in the Bulungan area, as in the whole of Borneo. The high demand from European industries and the common harvesting practices that entailed the death of the collected individuals (most trees were cut and then tapped) almost drove the species to extinction before World War II. But the market was suddenly displaced by the increasing importance of Para rubber from Indonesia, and *gutta percha* collection stopped. *Palaquium* trees are now common again in the area and sometimes tapped for local purposes.

The collection of *damar* (*Shorea* and *Agathis* resins) stopped because of the generalised use of chemical substitutes. Damar was the most important forest product in the area from World War II until the 1960s. Collection entailed the rarefaction of the product but never threatened the species itself as the resin is collected from either the base of the tree or the trunk itself, but not through tapping or felling of the tree. After 1960, the price for damar suddenly decreased because of the increasing use of petrochemical resins. Though still abundant, damar is no longer collected in the Bulungan region.

3. Extraction that recently boomed and might lead to exhaustion of the resource

Two products that have recently acquired an important market value and are heavily sought after are eaglewood and birds' nests. Having been managed and traded for centuries, both products are presently threatened by exhaustion as prices are starting to skyrocket.

7. Burkill 1935.

The *edible nest* of the cave swiftlet (*Collocalia* spp.) is a common ingredient in Chinese medicine. It is an item of longstanding trade with China, but its price boomed in the mid 1980s, probably because of the opening of the market with continental China. Traditional cave management systems have since been replaced by short-term (maximum one year) concession rights bought through auction. This measure, which was meant to protect the resource, is in fact causing its depletion as it pushes concession holders to harvest as much as they can and provides no incentive for sustainable practices.

Like camphor, *gaharu* or eagle wood, also used for medicine, has been exported for many centuries. The demand increased significantly at the end of the 1970s, when the supply of high quality *gaharu* from Vietnam and Cambodia was cut because of the political situation⁸, while demand from Saudi Arabia and the Gulf Emirates increased after the oil boom. In Bulungan, it seems that *gaharu* has always been collected, but its importance first slightly increased in the mid 1960s, and more seriously in the early 1990s. The *gaharu* boom attracted many outsiders to the area, who participated in large expeditions to the interior forests. As a result of the ‘*gaharu* rush’, the product became much harder to find after only two or three years, and by 1995 traders had stopped funding high cost expeditions. Looking for *gaharu* now belongs to the past.

4. Stable, though cyclic extraction

Rattan extraction dynamics follow cycles by which intensive periods of harvesting alternate with periods of low levels of collection. Rattan has always been traded in the area, but it gained importance in the late 1970s. When rattan started fetching a higher price, many outsiders also went into the forests to collect it. Just like *gaharu* it became more and more difficult to find. Since the price collapsed in 1989 as the result of an export ban, rattan collection declined, and it is now growing abundantly in the region again.

8. Peluso 1983; Jessup & Peluso 1986.

Conclusion: unsustainable extraction but sustainable extractivism?

The history of extractivism in Bulungan shows that, except for rattan, extraction of individual products appears to have been, for either biological or market reasons, quite unsustainable over time, going through boom periods and through recessions or exhaustion. The historical evidence questions the supposed intrinsic ‘sustainability’ of extractivism carried out by local people in the whole of Borneo as well as all over Indonesia. Apart from a mythical ‘environmental wisdom’ of indigenous people, there is no obvious reason why extraction for trade should be sustainable rather than practiced in a mining mode. In normal periods, sustainability usually happens by accident, as demand-driven collection pressure does not exceed the renewal rate of the resource. But in boom periods, incentives for harvesting as much as possible obviously run contrary to any potential arguments for sustainable management. These incentives include hopes for immediate gains, of course, but increasing competition with outsiders also eradicates any concerns for sound management. The obvious abuse of power by local or regional authorities over local collectors, and the

collectors’ related fears of spoliation or eviction, also plays against sustainability. Past experience of collectors, based on the marked instability of demand for forest products, has shown the relevance of opportunistic habits like switching from one product to another for income generation. Disincentives for sustainable management have increased with the recent fears that the forest will be logged or converted and that sustainability of forest management as a whole is not a relevant concern anymore.

As an integral economic and social activity, however, extractivism appears to be highly sustainable over a long time span and over a large geographical area. From the early times of trade in forest products until now, local people in Bulungan have managed to get what they need from the forest, in terms of both products and income. People of the interior of Bulungan district are quite well off, and this clearly is so because of extractivism: some forest products are more valuable than gold. With successive booms in *Gutta percha* and

camphor, then damar, *gaharu* and birds' nests, collectors have managed to stay active and productive for the last 150 to 200 years, relying on more or less constant products like rattan and fruits in times of scarcity. This situation gives interesting insights for further

assessment of extractive strategies in our study fields. What should sustainability aim at, sustainable management of individual forest resources or sustainable management of the forest resource as a whole?

4. Extraction of forest products in the Gangsal valley, Siberida, Riau: the permanence of forest extraction as foundation of the economic system

The people of the Gangsal valley belong to the Talang Mamak group, which is usually considered an isolated ethnic group (*suku terasing*). The Talang Mamak used to be forest collectors, but in many areas they have become more or less settled and now engage in rice cultivation through slash and burn systems. The Talang Mamak in the Gangsal valley, which still contains large tracks of good forest, live in settled villages, grow some rice in swidden and have started to grow rubber, but they still rely upon the collection of forest products. This forest dependence is nevertheless evolving quite rapidly, in close correlation with the growing importance of rubber cultivation.

Subsistence harvesting targets fish, game, fruits and staples for the daily diet. Though they grow rice in swidden fields, the Talang Mamak still rely on the starchy grains of the sago palm, which provides half of their annual needs in staples. This dependence on wild staples seems to be a choice dictated by taste and work efficiency, rather than a necessity. Subsistence harvesting also includes benzoin, locally mixed with tobacco, and building materials, as well as light materials for agricultural and forest collection activities or for home handicrafts.

Extractivism is an age-old practice, and the Talang Mamak are known to be the specialist collectors of one of the oldest traded forest products from Sumatra, dragon's blood, or *jernang*, a red wax covering the scales of the *Daemonorops draco* rattan fruits. They also collect *jelutung*, a wild latex produced by *Dyera costulata*, which was extensively traded in the eighteenth and nineteenth centuries. Extraction used to be the only income-generating activity in the valley. However, the importance of extractivism in the economic life of households has considerably decreased during the last 20 years. This decrease is strongly correlated to the increasing importance of rubber growing. Villages still actively collecting forest products are those that are just starting to grow rubber, whereas the less involved are those where rubber gardens are already extensive. There is a clear transition from the collection of *jelutung* in the forest, which is still important in the first set of villages, to the cultivation of Para rubber.

Extractivism is generally used as a complementary strategy in a system dominated, or starting to be dominated, by rubber production. It compensates for regular seasonal decreases in rubber production as well as for unexpected price drops, and it provides a regular additional source of cash income in the economic portfolio of households. There are obvious differences in the management of the different forest products. Whereas *jelutung* tapping appears to be a relic activity present only in villages with young rubber gardens, rattan collection is more adaptive and flexible. Dragon's blood collection is a more specialised activity that keeps a relatively constant importance, probably because of its high value per unit of weight and historical affinity of the Talang Mamak for the product. The Talang Mamak tend to stick to 'traditional' forest products (rattan, dragon's blood, *jelutung*), and collect them in a sustainable way, in contrast to extractivism carried out by outsiders, who plunder fancy and high-value products such as *gaharu* a few years ago, and more recently turtles, songbirds and timber. The Talang Mamak are slow to understand the profits obtainable from aggressive extractivism, and when they finally decide to join in, the resource is already declining, and the profits they make are meagre.

Extractivism is important as a starter activity for newly established households. It brings income during the few years between the establishment of a rubber garden and its full production. The social and economic welfare of established households, however, is usually not achieved through extractivism, but mainly through rubber cultivation. In other words and as stated earlier, people do not get rich if they stick exclusively to extractivism, which probably explains why extractivism is perceived as a backwards activity in comparison with rubber growing.

Conclusion: Is the extraction of forest products a declining base for household economy and a devaluated mode of subsistence?

Even though it represents the main, if not the sole, economic activity in the valley, the extraction of forest products, and in particular commercial extraction, is rapidly declining. This decline stems from the negative perception of the activity among the practitioners themselves and among the surrounding social groups of Melayu farmers and village traders. This negative perception concerns the economy of forest subsistence and extractivism, as benefits of extraction are perceived to be less important than those that can be obtained from rubber cultivation and more difficult to get in terms of labour and physical effort involved. The low economic profitability includes collectors' perceived lack of bargaining power when facing organised traders and fluctuating international markets, even though most villages have refused to accept any credit from local traders in order to keep some

'freedom'. But the negative perception also concerns the social and cultural value of the activity, which is considered 'backwards'.

As for all isolated forest tribes in Indonesia and the Philippines, the gradual abandonment of the collection of forest products epitomises the current economic, socio-cultural and political transition of the last true 'forest people' in the region as they witness the perceived benefits linked to the 'development' of their neighbour farmers. The collection of forest products might be important for identity claims, but it is undesirable as an integral economic activity.



The Gangsal valley is still forested.



Access to villages is by river.



Fruit trees surround villages.



A recent activity, the cultivation of swidden rice provides for half of the annual starch needs.



Wild fruits (here *Baccaurea* sp.) represent an important part of the diet.

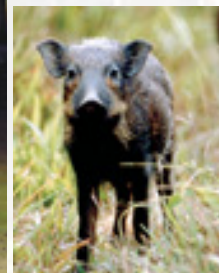
Forest foods are essential for the Talang Mamak.



Benzoin is a culturally important forest product in the Gangsal valley. Besides being used in religious ceremonies, it is mixed with locally grown tobacco and smoked.



Starch extracted from wild sagu palm provides half the annual need of staples.



Hunting is a major activity and provides the totality of the proteins.





Extractivism in the Gangsal Valley.



Rattan is still an important income-generating forest product.



Outsiders are initiating the Talang Mamak to the collection of new products, like these turtles to be sold in Jakarta and Singapore markets.

Extractivism is the major cash-generating activity among the Talang Mamak. It mainly concerns traditional forest products, traded for centuries from the eastern Sumatra lowlands.



Benzoin is also traded locally.



The Talang Mamak are still collecting the latex of Jelutung, which was the main product traded from the Sumatra lowlands during the eighteenth and nineteenth centuries, but now has a very limited market.

Dragon's blood is among the oldest products traded from Sumatra by forest people. The red resin covering the fruits of rattan *Daemonorops draco* is processed into a deep-red wax in China.



5. Extractivism as an integral system: the Batak in Palawan

In less than a century, the Batak community of Tanabag, Palawan Island, Philippines, has evolved from nomadic hunting and gathering to sedentary systems. They have engaged in swidden rice production and in trading NTFP formerly collected for subsistence purposes. Almaciga, the resin of *Agathis*, and rattan used to represent the major trade products until the early 1990s, but presently they constitute only 37% of village income. This decrease is a consequence, in particular, of (i) forest resource decrease; (ii) price drop, and the related reluctance to engage in a strenuous activity for a decreasing return; and (iii) strong dependence on concessionaires. These factors drove the Batak to diversify their activities in the early 1990s. Besides off-farm employment, the Batak have taken advantage of locally developing markets in NTFP. They engaged in the commercial collection and direct sale of more 'traditional' products with a high social value, like honey and game meat, which give them more independence and help to better distribute incomes over the course of the year.

The Batak still rely heavily on indigenous knowledge systems for the collection of almaciga and rattan. They have their own rotation system for the gathering areas, whereby a particular portion of the forest is left to regenerate for a period of time—usually five years—before being harvested again. The Batak system of tapping almaciga trees may not be ideal, but they are aware that they should not wound the tree to such an extent that it will die. The sustainability of almaciga and rattan collection is endangered by external factors, among which is the entry of professional collectors from the lowlands. Competition for the resources erodes the strict adherence to positive indigenous knowledge systems, and as lowlanders are gathering rattan from the fallow areas, the Batak are forced to harvest the canes before the usually observed term. Lowlanders introduced the deep wound system of tapping almaciga trees to maximise the oozing of resin, and there were cases of resin poaching from trees the Batak considered their property.

Historically, honey defined the relationship of the Batak with the forest. During their lives as nomadic hunters and gatherers, they used to temporarily settle where honey was abundant. From these spots, they enjoyed other resources available for extraction. Now that they are relatively stationary, honey is losing social meaning, but may be more commercially important. Palawan honey has considerable demand outside the province. Some fly-by-night processors, however, sell the honey in adulterated form, to the detriment of those who sell pure honey. In terms of resource management, the Batak know the factors that enhance bees' honey production and their association with certain tree species, and they have a distinctive way of gathering honey from the hive.

Though extractivism provides 80% of Batak household income, it is difficult to conclude that village economy is exclusively based on extractivism. Contrary to the situation observed among the Talang Mamak, extractivism here is not an integral professional activity, but one among other strategies to ensure food security at the village level. The Batak have kept a highly communal social organisation based on the sharing of all available resources. The economic behaviour cannot be encompassed at the household level, but at the village level. The economic activity of each individual household converges towards the collective subsistence strategy. Agricultural production at the village level is insufficient to provide enough food for all villagers. But income provided by extractivism allows them to balance the insufficiencies of the food production systems. Some individuals produce more than others, in terms of either direct food production or income provision, but individual benefits are redistributed among the community. Whereas many families cannot provide food security, kin food—the interhousehold sharing of food—circles permit resource repartition and, then, the survival of the community.

6. Forest collection and survival in the Bungo valley, Jambi, Sumatra, 1997–98

The extreme drought of 1997–98 in most of South-east Asia under the influence of El Niño, which entailed the almost complete failure of rain-fed rice crops, illustrated how forest collection and extraction can suddenly become essential even to settled farming communities situated on the edge of the forest and engaged in commercial agriculture, communities which, in normal times, hardly rely upon the forest for subsistence or cash income⁽⁹⁾.

In the Bungo valley of Jambi Province in the eastern lowlands of Sumatra, farmers live in settled villages, grow wet rice in seasonally flooded lands and dry rice in swidden fields opened in secondary forests, and produce rubber and cinnamon for export markets. Initiated 100 years ago through integration into local shifting cultivation systems, rubber cultivation is the main income-generating activity. It is practiced not in specialized stands but in complex agroforestry gardens, which also include fruit trees, timber species and other useful plants. Few patches of natural forests remain on the borders of agricultural lands. Gathering of wild plants for subsistence usually occurs in the rubber agroforest belt, while some commercial extraction activities take place in the natural forest.

Together with the near-total failure of rain-fed rice crops, the prolonged drought of 1997–98 entailed the collapse of vegetable and fruit production in open fields and gardens, and a sharp decrease in rubber sap flow, which translated into a more than 50% fall in daily harvest. At the same time prices of basic commodities soared, while prices of export commodities

9. Clément *et al.* 1998.

decreased. For all farmers, income sources literally dried up while expenses increased dramatically.

The immediate reaction in all villages along the valley was a generalised rush towards the forest in order to harvest any potentially edible or marketable product available. Collection of forest game and plants significantly improved the villagers' diet, while extraction of forest resources for trade boomed, witnessing both a generalisation of commercial fishing and bird catching and a diversification towards new products including lower-value birds, tortoises, wild cats and bears, but also rattan, the edible pods of *Pithecellobium lobatum* and *Parkia speciosa* of the legume family, which exhibited an unusually plentiful fruiting season, and honey, which also enjoyed exceptional production, allowing 'miracle' harvests for more than two months. The profitability of this quite aggressive emergency extractivism was impressive. For example, a single honey tree, harvested by a group of a dozen people, yielded between 100 kg and 400 kg of honey, which sold at Rp. 4500/kg (about US\$1.60 in November 1997), enough to cover the expenses of the families involved for more than two weeks. The gathering of legume pods yielded a daily average of 25 kg of husked fruits, worth Rp. 7500 (US\$2.60). Compare these returns with those from rubber tapping, which usually provides about Rp. 4000 (US\$1.40) per collector per day.

The sudden burst of forest-related activities was quite different from regular forest harvesting. It was really aggressive and unsustainable, even for a medium term, and it targeted any source of food and cash at whatever costs in human energy. The best illustration of the desperation was the revival of rattan collection, formerly considered unprofitable because of the low market prices and the long walking distances. The emergency extractivism did not involve rubber agroforests, which did not have enough untapped resources or unexplored space to accommodate the needs of whole villages. It did not rely on external demand—but rather stimulated it—or external organisation. It was not confined to a given social group, but attracted all classes and ages, men and women, elders and children, wage labourers as well as landlords and shopkeepers.

Conclusion: the irreplaceable complementarity of forest and agriculture in the tropics

This forest-related emergency strategy developed in many places of Sumatra and Kalimantan during the long El Niño period in 1997–98. It highlights the ultimate complementarity of forest and agriculture in relation to risk management. The buffering role of forests is not only essential in remote forest communities, but persists even in communities where farmers have a diverse production system and are well integrated into a market economy and commercial channels. Indirectly, it points to the invisible consequences of rapid and massive forest conversion, for example, conversion to monocrop

tree plantations by estate companies. Most farmers in the rural areas of tropical countries lack the capacity for income accumulation, saving or hoarding. They usually consume all they produce and are therefore highly vulnerable to any unexpected decrease in their regular food production or income. Maintaining patches of natural forests in farmlands in order to retain this forest–agriculture complementarity is essential, especially until other strategies can be found.



Bush fires followed the drought.



When farmers survive through the forest: Muara Bungo, Sumatra 1997

During the long drought of 1997, settled farming communities in Sumatra survived the total loss of their rice crops and the decrease of rubber production by turning to the forest to collect any potentially edible or marketable product available.



Commercial fishing and bird catching boomed, providing important income.



Hunting significantly improved the villagers' diet.



The whole village, including women and children, rushed to the forest in order to survive.




The honey season was exceptional and the sale of honey allowed to purchase complementary foods.



Legume pods (*Pithecellobium* and *Parkia*) were abundant and constituted an important vitamin supply as well as an interesting source of cash income.

Timber harvesting drastically increased during the drought period.





A worker cleans the bark of Lauraceae, used in the manufacture of incense sticks.

Extractivism in the Batak lands

Extractivism in the Batak area is totally opportunistic and driven by the dynamics of traders. Managed so as to get maximum return in minimum time with minimal labour input, it temporarily affects resources negatively. After having exhausted the stock of aromatic Lauraceae bark, collectors switched to illegal timber harvesting and to an intensive collection of singing birds for large city markets.



This debarked Lauraceae tree is not going to survive.



The few extractive activities that remain sustainable are mainly 'traditional' ones linked to old markets, like the collection of rattan or, here, of *Uncaria* leaves. The leaves are locally processed to produce *gambir*, a substance locally used in the preparation of betel, and processed industrially as a tanning agent.

7. Extractivism in the Toba Batak highlands, North Sumatra: the opportunistic nature of forest products extraction for settled farming communities

Forest extractivism in the Batak highlands is marked by a succession of generalised rushes on a given fancy product involving the whole population. There is always a strong correlation between this sporadic forest extraction and the intensity of benzoin tapping. In rush periods, benzoin harvesting may temporarily be neglected.

One fancy forest product was the tree bark of *Lauraceae* and related species, presumably for the processing of incense sticks. Tree bark is an easily accessed and harvested resource. Most of the Batak highlands households responded to the solicitation of traders and rushed to any available tree. The rush exhausted the resource, including from saplings, in less than two years, and traders moved to new areas. The next rush seemed to concern singing and ornamental birds for city markets in Indonesia and surrounding countries.

There is also a more regular background of specialized harvesting carried out by ‘professional’ individuals. This specialized extractivism recently switched from rattan to timber. As far as profitability is concerned, timber is the most profitable of all collected forest products in the area. Timber is risky business, however, as it requires investment for chainsaws and sometimes minivans; labor organisation with a boss, chainsaw operators for cutting trees and preparing boards, and transporters; and proper connections to the authorities in charge of the timber business, as marketing of timber collected by farmers is totally illegal. Because of the high risk, not everybody engages in timber harvesting and there is a marked tendency to maximise short-term profits, which translates into cutting as many trees as possible as long as business goes on.

This form of illegal timber harvesting seems to have generalised over Sumatra and Kalimantan since 1995-96. It was observed in the Riau and Muara Bungo sites, as well as in the Rantau Layung valley in Pasir, East Kalimantan. In most places, it was correlated to the development of illegal local sawmills. With the rates of extraction observed in all the surveyed areas, the timber business was destined to last for a brief period, with most of the more valuable and accessible trees probably gone within two years.

Conclusion: the relation between dynamics of demand for forest products and lack of sustainability of extractivism

Extractivism in the area illustrates the totally opportunistic and unsustainable management of modern demand- and profit-driven forest collection. In the array of economic activities available to benzoin farmers, extractivism is one way of getting the maximum return in the minimum time with minimal labour input. This attitude towards forest collection is strongly correlated to the highly fluctuating and fleeting nature of external demand for forest products

conveyed by outside traders. Farmers react to this uncertainty by maximising the profitability of extraction, without long-term concern for sustainability, as there is no related, intrinsic sustainability in the market. Traders also maximise their profits by targeting places where there is ample supply, which they exhaust before switching to another promising place.

8. The rush on birds' nests in East Kalimantan: who benefits from the trade? Lessons from Long Apari

The birds' nests referred to here are the nests produced by several species of swiftlets (*Collocalia* spp.), which are made of the bird's saliva and certain other materials. Several trade categories are recognised, which correspond to either zoological subspecies or varieties, or to local environmental or possibly seasonal factors. The most highly valued is the 'white nest' (*sarang putih*) made by *C. fuciphaga*. Others are the 'black nest' (*sarang hitam*) made by *C. maxima*, 'mossy nest' (*sarang lumut*), 'bald nest' (*sarang gundul*) and 'pink nest' (*sarang merah*).

Birds' nests have been collected and traded in Borneo for centuries, and probably well over a millennium, mainly or solely for the Chinese market. Up to this day, the market for these nests is China and the overseas Chinese communities, where they are used as a tonic and medicinal food. Although macroeconomists call it a residual market, it involves huge amounts of money. While the bulk of Indonesian birds' nests is now produced in 'domesticated' conditions (see section 10 below), people in East Kalimantan still exploit the nests found in natural caves in the forest.

The remote district of Long Apari along the Mahakam river in East Kalimantan is, with the regency of Berau, one of the principal producers of birds' nests in Kalimantan. In 2001, it exported an estimated 30 metric tons, for a value of about Rs. 60 billion.

The Aoheng people living in Long Apari have long known and occasionally collected and traded the edible nests of swiftlets. Because nests fetched low prices, however, the Aoheng preferred to collect other forest products. In the 1930s, Long Apari exported mainly the *jelutung* latex (*Dyera costulata*). The focus shifted to timber in the late 1960s, to *damar* resins in the mid-1970s and then to rattan canes. In the early 1980s, the birds' nest trade in Long Apari was suddenly and powerfully boosted by rapidly rising world market prices. From 1987 on, birds' nests became the most sought-after forest

product, along with incense wood (*gaharu*, *Aquilaria* spp.). Prices rose steadily to reach Rp. 500,000 per kilogramme in 1990, and production rose to between four and five tons per year. This development marked the beginning of deep trouble for Long Apari.

In local customary systems, caves were privately owned by their finders, the rights passed from one generation on to the next. Collectors could freely sell the nests to traders in Samarinda at market prices. In 1978, the regent of Kutai issued a decree on birds' nest exploitation, ruling that all birds' nest caves in the regency were the property of the regency government, which could appoint a concessionaire to exploit them on government's behalf*. The decree was not enforced in Long Apari until 1990, when a concessionaire for Long Apari was appointed through an auction held by the regency government. Traditional cave owners then had to sell their harvest to the concessionaire at a set price much lower than market price. Over the following years, the local collectors increasingly tried to evade the concessionaire's monopoly and smuggle nests to Samarinda. The concessionaire reacted by involving army and police to catch the smugglers.

In 1993, the situation started to deteriorate. People were harassed by plain-clothed police and military personnel. Hundreds of outsiders flooded Long Apari. Exploration of the territory intensified dramatically, with hundreds of men roaming the vast forests and discovering many new caves. The district's overall production rose to 20 tons per year.

In 1995, and again in 1997, the Foundation for Aoheng Development, an association of Aoheng personalities with supposedly nonprofit goals, entered the game as the winner of the concessionaire auction. It proved even worse than its predecessors in the eyes of the local people. It bought birds' nests at only Rp. 1 million per kilogramme in Long Apari, while the price in Samarinda had risen to Rp. 2.5 million. It brought more outsiders to the district and relied in a more heavy-handed way on army and police to catch smugglers and intimidate the population. Worse, it contributed to pitch community leaders against one another and split the local communities into warring factions.

In 1997, new administrative and legal problems added to the already tense situation. In an effort to gain control over the birds' nest trade, the Directorate General of Forest Protection and Nature Conservation (PHPA), viewing the swiftlets as wild fauna and thus lying under its jurisdiction, began to grant concessions to large companies to exploit the nests. Thus it appointed the LBPS company for the district of Long Apari. The Foundation for Aoheng Development called on special units of the army to prevent LBPS from effectively operating in Long Apari. In 1999, after Soeharto's fall, the situation became even more complicated. While the director general of PHPA and the regent of Kutai were suing each other over the question of which had authority to control the birds' nest trade, the law on Regional Autonomy (Law No. 22 of 1999) established the new regency of West Kutai, among others. The newly installed regent of West Kutai invalidated the concessions previously granted by the head of the former regency of Kutai, and he issued exploitation rights over various sectors of Long Apari to several local parties. Those and the earlier concession holder then sued each other.

In 2001, Long Apari had a registered resident population of 4,000 to 4,500, some 800 of whom were outsiders. There were also possibly over 1,000 unregistered people wandering in the forest, in the vicinity of cave areas, where base camps

* This measure primarily intended for the government to appropriate the profit of the strongly developing market of white birds' nests in Sangkulirang in the northeastern part of the regency, where concessionaires were indeed appointed.

had been established. The police, in turn, established stations (*pos*) at strategic locations to control the collectors, appropriating 10% of their harvest as a sort of tax. Plundering of caves by masked and armed gangs became common, and some fifteen birds' nest-related murders were recorded over the period 2000–2001. Following the murder of one customary chief in May 2001, the Aoheng started retaliating by stalking isolated outsiders in the forest.

Among the Aoheng, suspicion and factionalism prevailed. In the course of time, most of the traditional leaders had been involved in rather shady deals with one concessionaire or another, and not a single one of them retained any substantial measure of confidence among the population. With people spying on one another, occasionally robbing one another's caves, the social atmosphere became extremely pernicious. The traditional custom was no longer abided by, mutual help activities were no longer performed, and the traditional customary community fell to pieces.

Who, in fact, benefited from the birds' nest trade? Winners included the bigger cave owners, who could afford a private militia to protect their caves or were able to bribe the police to do so; the traders, be they Aoheng or strangers, who could make a profit, thin or fat, on small or large quantities of nests; various government agencies including the regency government and the directorate general of PHPA; the police, through licit or illicit 'taxes' and honorariums, as well as the army; and a handful of lawyers, since the confusing legal situation triggered a large number of lawsuits. But most small cave owners could not afford to guard their caves against being plundered repeatedly until they ceased to be productive and were abandoned. Others had to grant exploitation rights to traders, went deep into debt and eventually relinquished ownership of their caves. All in all, few Aoheng have benefited from the birds' nest bounty.

The bird populations were also heavily affected as the collection was carried out in a highly unsustainable way. Instead of the two-and-a-half-month interval that is needed for the birds to reproduce, nests were collected only 45 days, 30 days, or even 10 days after the birds had started building them, which did not allow sufficient time for the young to leave the nests.

What are the prospects for such a business? The combination of the scattered nature of caves in the forest, highly insecure tenure and complex legal framework, extremely high prices and the extractivist approach to the collection of forest products for trade commonly displayed by local groups leaves little hope for a long-term, sustainable exploitation of birds' nests. It is possible that the swiftlets will not become extinct. The disturbed birds may move away to another cave area. Or the birds' nest boom may eventually recede—because of supply depletion or price recession—and, subsequently, outsiders would leave the area and the swiftlet population could grow again.

Beyond its disastrous social effects, this example illustrates the highly unsustainable nature of forest extraction for trade. From the point of view of the local communities, birds' nests, like other forest products, are trade resources, mere commodities, which they exploit in a highly opportunistic way, following market demand and fluctuations, and without any qualms. When supplies of a product are exhausted or market prices fall, they redirect their attention towards other products. In the course of history, the Aoheng and their neighbours have repeatedly switched from one forest product to another.

When birds are gone, the Aoheng will focus again on their swiddens, at times taking advantage, as a side activity, of some new opportunity, be it the collection of yet another forest product, wage work or the growing of magic mushrooms. The birds' nest frenzy will remain in their collective memory as only one episode among many in the long history of their highly diverse successive economic pursuits.

9. Birds' nests: towards domestication?

Before the above-mentioned rush, many of the birds' nest caves, especially in Java, were managed in order to increase production and ensure sustainability. These practices did not really relate to domestication, but at least humans were positively influencing the birds' habitat for production purposes.

Another process of more intense 'domestication', which has been underway for some time, is presently booming. For several decades in Java, more recently in Sumatra, and probably in relation to the reduction of their natural habitat, swiftlets have been coming closer to villages. Some of these birds have started to nest in dark, abandoned houses, and the nests have started to be collected. In Java bird nest production from naturally colonised houses has developed slowly but never boomed. But recently, in conjunction with increasing demand and the related soaring prices, this rather 'traditional' production has been developing the idea of artificial 'caves' that would simulate the environmental conditions of the natural breeding places—constant darkness and humidity—, attract more birds and give incredible returns. Such 'cave houses' have burgeoned during the last few years, especially in the south of Sumatra, and have introduced new domestication patterns. Whereas 'traditional' breeding is usually carried out in a passive mode, by which owners just let their house be invaded by birds (success therefore becomes a matter of good luck), modern breeders engage in active and large-scale breeding. They build huge, concrete birdhouses with all facilities for the birds. They try to attract birds with recordings of swift songs, by spreading guano on the ground or by using other swiftlet species as a relay. The knowledge and practices involved in this modern attempt at breeding are inspired by traditional empirical knowledge—knowing a bird's habits is definitely important—but have also integrated scientific data on bird ecology, as well as technical recommendations conveyed by specialized sources, and modern gadgets like tape recorders, watering systems with timers, barometers, laying machines, etc. In addition to knowledge and practices, some moral norms have to be respected, which include respect for the birds, a humble attitude, patience and a lack of greed. This modern breeders' ethic is a reflection of cultural practices observed by forest collectors, which aim at 'attracting good luck' on the collector.

Unusual ‘breeding’ through unusual ‘farmers’. Does birds’ nest production in artificial caves constitute a true process of domestication? The breeders do not manipulate the resource itself (the bird) or its habitat. Swiftlets are more commensal with humans than domesticates. The main domestication action concerns the breeding place, which is strongly manipulated, even reconstructed, in order to attract the bird and capture its produce. This practice reminds of the current way of beekeeping in the region, whereby farmers capture wild bees and put them into locally built wooden hives. The swiftlet breeders are not former birds’ nest collectors. Whereas collection is carried out by local people living in forest areas, bird breeders are usually not even farmers. Until rather recently, breeding was mostly carried out by middle-class shop owners, often ethnic Chinese. The activity was linked not to the countryside or to the forest, but rather to semi-urban environments like large villages, small cities and the surroundings of large cities. A new process is presently being developed, whereby rich businessmen from large cities, who engage in bird breeding as they would in any other business activity, build large birdhouses in opened rice field areas.