

## Forest deforestation and reconstruction

### *Lines of research for a hybrid issue*

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What does the pasture with which migrants have replaced forest in Amazonia or Madagascar have in common with the complex agroforests rebuilt around damar or rubber by Indonesian communities that have lived in forest regions for some considerable time?<sup>1</sup>

There are two answers. Although the final results are diametrically opposed, they both involve the eradication of the initial forest environment. Again in both cases, the second stage of conversion consists in rebuilding an agro-ecosystem suited to new uses and user categories. The difference lies in this second stage, when it comes to matching or to reconciling an agro-ecosystem combination with the target uses and priorities of a given community. The two dimensions – social and ecological – of forest conversion are inextricably linked. Assuming, as is implicitly the case in analyses of this type of phenomenon, that nature and humanity are implacably distinct and can be understood independently of each other prevents us from understanding – and intervening effectively in – these specific cases in which they quite evidently interact. For research, the topic or issue is indeed this variability of the relationship between communities and forest.

A comparison of forest conversions in north and sub-Saharan Africa, Latin America and Asia<sup>2</sup> led us to redefine the phenomena covered by the term 'deforestation', since it was too simplistic and therefore inappropriate. It in fact covers a wide range of environmental conversion patterns that have very contrasting ecological impacts, at least if one considers these phenomena for what they are: historical processes of reciprocal adjustment between human communities and the rest of their ecosystem, in this case, forests. These interactions between social systems and ecosystems, which evolve and thus need to be viewed long-term, indeed constitute a hybrid issue.

There is obviously no question of denying the massive extent of forest conversion in tropical regions. However, it is necessary to look more critically at previous quantitative estimates.<sup>3</sup> Moreover, it is important to bear in mind that such conversions are to tropical countries today what they were to temperate countries in the past: operations aimed at reappropriating an environment or merely its forest component for purposes suited to a changing community. Lastly, as shown by the above examples, these phenomena can always be broken down into two phases. The first consists of what we shall

refer to as deconstruction, insofar as total eradication is merely an extreme option in a range of intermediate solutions. The second always consists of a reconstruction phase, which can range from purely agrarian or pastoral systems to complex forest gardens set up within smallholder units. It is worth noting that for those examples for which enough time has passed to enable a valid assessment, more often than was previously thought, the pioneer stages of radical conversion are followed by a rebalancing phase that benefits forest components and sometimes forest formations.

It is necessary to pinpoint current smallholder practices and their impacts on the ecosystem case by case, as a point in a process of change. On a global scale, it is reasonable to wonder whether the historical conditions that governed the generalization of these forest conversions are not coming to an end and also whether agroforest-type reconstruction practices are not now spreading.

By focusing on the negative impacts, preferably on a global scale (loss of biodiversity, global warming), the dominant debate on this issue has, if not overlooked, then at least excessively over-simplified the range of conversion processes and their impacts. By lumping specific situations together, it tends to make them look like a single phenomenon related to a 'global' process: deforestation.

To report on the main information gathered by comparing the socio-historical process analysed, we shall begin by reconsidering this myth surrounding 'deforestation', in terms of both its characterization and its assumed causes. We shall then present the unexpected observations and recurrent phenomena concerning conversion patterns, and conclude with the questions raised by these examples and the research topics they could generate.

## **THE 'DEFORESTATION' MYTH**

While there was an increase in deforestation or forest conversion in the last two thirds of the twentieth century, as confirmed by the examples quoted below, these phenomena were limited to specific regions and particularly to socio-historical situations. Moreover, they have often been overestimated or wrongly interpreted due to a lack of or over-hasty field characterizations and checks. Lastly, the main three causes generally quoted – population pressure, public policy failure and market malfunctions – in themselves generally have only a low heuristic value in the cases studied.

Using statistical data and spatial imagery does not compensate for a lack of caution or common sense when interpreting the situation. As in the case of Côte d'Ivoire described in Chapter 6, this can result in the doubling of loss estimates for forests implicitly considered as primary or intact. However, if around 6 of the 12 million ha cleared by Ivorian smallholders had already been cleared by their ancestors, the current 'deforestation' in

the country is neither as extensive nor, above all, as significant as statistical or aerial studies would generally have it. Concerning Guinea, Fairhead and Leach (1998) reported that woodlands in the intermediate forest-savannah zone they studied were entirely artificial and used extensively by villagers, who tended to enrich and extend them. However, they were considered by state foresters and consequently by the international evaluation bodies which those foresters supply with 'data' as 'forest relicts'. Thus in the vision put forward on an international level, these smallholder reforestation practices become a form of proof by default of a 'deforestation' phenomenon seen in all likelihood as 'no doubt longstanding'. This type of blunder is more common than it might seem. Without casting doubt on the intensity of forest conversion worldwide, it is important to point out that the evaluation methods used tend to play down if not totally overlook the wide range of past or current processes.

However, it is the main factors or forces accused of causing deforestation that best demonstrate the myth:

- In a single country, Indonesia, the expansion of market-based thinking to areas that were previously relatively marginal has led to the eradication of 55–95 million of the 145 million ha of forest, as well as to the creation of the damar, rubber or benzoin agroforests already mentioned (Michon and De Foresta 1995, Michon et al., 1995; Karsenty, 1999).
- Population growth is not in any way responsible for the conversion of the Ivorian forests, which on the contrary was prompted by an extensive development system fostered by land availability and incentive policies, and then by smallholder strategies favouring migration (see Chapter 6; Verdeaux and Alpha, 1999). A similar observation has been made for Brazilian Amazonia, although the foreseeable population growth among migrant populations is a cause for concern for the future (Léna, 1999). Nevertheless, generally speaking, the effects of population and land pressure are ambiguous. Beyond a certain threshold, which varies depending on the situation, such pressure leads to intensification practices and/or makes use of forest resources and ecological services, as in the case of the Chaggas agroforest gardens of Tanzania (Fernandes et al., 1984) or the orchard gardens set up in the valley bottoms of the fossil hydrographic network of Niger (Roussel, 1999).
- Public policy, on the other hand, has triggered massive conversion processes in several cases (Côte d'Ivoire, Brazil, colonial Indonesia), or deliberately organized them (Indonesia since independence). However, the state is increasingly just one of many players, whose role varies considerably depending on the situation. It generally tends to defend its own interests against different forms of international pressure. If it has a failing, this most probably lies in its loss of control of social dynamics that it often set off itself and which often prove to induce resource

management and land appropriation practices (as in Côte d'Ivoire, Brazil and Nicaragua).

- In terms of impact on biodiversity, the only example in our comparison that looks at this aspect (Niger) indicates an increase in plant biodiversity values between the initial gallery forests (of *Acacia nilotica nilotica* and *Indigofera oblongifolia*) and the orchard gardens that replaced them (Roussel, 1999). The practices aimed at enriching the forest formations induced by human activity with plant species have also been observed in the Guinean smallholder woodlands and Chaggas multi-storey gardens. Without casting doubt on the diagnoses of losses of certain types of biodiversity on a global scale, these comments again show that on the one hand, each situation should be appraised individually and not using standardized observation grids, and on the other that while agro-ecological reconstruction by humans modifies this diversity, it does not necessarily reduce it.

#### **CONVERGENCES AND RECURRENCES BETWEEN SPECIFIC CASES**

None of the possible forest uses seems in itself to be inevitably destructive. Besides gathering and hunting, which are clearly at the start of the scale ranging from protection to destruction, none of the other three uses is necessarily at the other end. The cases quoted are thus generally somewhere in-between the two extremes.

- Animal production, which results in the total eradication of the forest in Amazonia or Madagascar, causes only relative degradation in Tunisia (Auclair, 1999) and is a seasonal operation that does not destroy the lowland forests of Niger.
- Agriculture only results in total conversion under certain conditions: when it is planned and practised in the form of fields and pasture, geared towards mass production and maximum yields per plant and per area unit. Other, more conservation-oriented forms are still practised in tropical forest regions. Initially, the conversion of Ivorian forests led to the adoption of tree crops combined with food crops (tubers and banana) compatible with partial maintenance of tree cover. The subsequent more rapid destruction of the tree cover was partly caused by the introduction, which was unfortunate in this respect, of 'improved' cocoa and coffee varieties that were more productive but had very little need of shade.
- Particularly in the event of population growth and land pressure, shifting agriculture based on slash-and-burn does not subsequently rule out controlled, sustainable reconstruction of forest-type plant formations. The complex agroforests of Indonesia are a prime example. Cleared

secondary forest land is initially used to grow rice. It is then planted with coffee and shade trees, intercropped with pepper. In the third phase, the damar trees planted during the second phase form the basis for selected, enriched forest regrowth, particularly of fruit trees (Michon and De Foresta, 1995). The complementarity of the various products over time, the gradual recognition of the environmental services provided (erosion control, river regulation, water quality), the minimal amount of upkeep that the trees require and the reduced climatic and economic risks resulting from the wide range of activities apparently replace the optimum yields ensured by the previous field and pasture-based systems.

- As in Indonesia, logging can result in clear cutting and the definitive conversion of the areas freed from their initial protected 'resources' into monospecific plantations (palm oil, rubber and so on). It can also be selective, as was the case in Côte d'Ivoire in the first half of the twentieth century and subsequently to a lesser extent. In view of the threats currently hanging over the country's remaining listed forests, international donor agencies see logging as the best way of protecting them by making optimum use of them. This idea would be more credible if, by reversing the relations between farmers and the forest, which date back to colonial times, a way was found of involving local farming communities in forest management. More generally, the state's renunciation, in both Côte d'Ivoire and Indonesia, of its monopoly on wood resources could encourage farmers to consider and manage trees as elements of their heritage that are both economically worthwhile and socially transmissible.

In short, it is the socio-political context that seems to be the most determining factor in triggering the processes leading to the different types of conversion. The initial options chosen concerning the modes of these processes and the paths taken were for the most part prompted or governed by public policies. The divergence between the proclaimed objectives and the practicalities, which we have already seen for Côte d'Ivoire but which also applies to Indonesia, cannot solely be put down to their misuse. Such divergence are seen wherever the state and its current substitutes, international organizations or NGOs, prohibit access to and use of an area on the premise that it is forest.

The discrepancy is inevitable given the more-or-less deliberate ignorance of the hybrid nature of the processes at play. Whereas the protection and effective management of so-called 'natural' heritages and resources are highlighted, all the measures taken are political, leading to sociological reshuffling. They consist solely in reorganizing the relations between different groups concerning these resources and areas. Irrespective of certain variations, these social relations systematically centre on the same issues: delimitation of agricultural

and forest zones, each reserved for a category of users, hence invalidating any existing access and usage systems; redefinition and reallocation of resources and areas based on a new social classification (foresters versus farmers in Côte d'Ivoire) and exclusive access for one category to the target resource; varying distribution of income from forestry according to the same sociological classification; and changes in land status and transfer of ownership to the categories the state has decided to favour.

In Côte d'Ivoire, farmers eventually managed to overturn in their favour the land allocations made to forestry companies by the colonial authorities. They stripped the areas of the elements (trees) that had in their view become a non-resource and that justified the access rights granted to logging companies. In Indonesia, on the other hand, once they have been exploited to produce timber, logging concessions, which are by nature temporary, are generally converted into almost fully-owned areas (long-term concessions) and again granted to logging companies, which convert them into tree plantations (palm oil, rubber, fast-growing species for paper-pulp production). The farmer/slash-and-burn farmer/gatherer communities whose common law rights are recognized by the Constitution are thus definitively expropriated and become migrants in search of new areas to clear, unless they agree to be employed on site, in the plantations set up on their land.

Those excluded or marginalized may also react very violently: in addition to rebellions, they sometimes also opt for immediate gain and over-exploit the remaining resources or eradicate the trees at the same time as their corresponding rights are invalidated, as in Côte d'Ivoire. In extreme cases, even more desperate solutions are chosen, such as the burning of the forests in Kalimantan, Indonesia, in 1997/98. It is worth noting that this was presented as an 'ecological' catastrophe, yet again emphasizing only its impact and supposedly 'natural' aspect.

## **CONCLUSION: ISSUES AND LINES OF RESEARCH**

At least in terms of research, four main items of information can be drawn from the comparative analysis of forest conversion in the three continents covered by the tropical zone: Africa, Latin America and Asia:

- The processes identified are hybrid, in terms of the ongoing interaction between the social restructuring and environmental reconstruction that characterize them. Forest conversions are not inevitable and do not obey any evolutionary function or law: they vary considerably and arise out of the social conditions in specific historical situations. Moreover, it is the new social relationships established through land and resource appropriation, generally by force, that give rise to environmental use and resource management methods, rather than the contrary. In practical terms, the only way of influencing these use and management methods is to intervene in regulating the relations between different groups concerning

their environment and, through a series of links, well beyond. Once the environment becomes an issue, even to ensure total protection, it is no longer 'natural'. From this point on, even allowing for the very unlikely possibility that there were no links beforehand, it is clear that everything that happens, is negotiated and established, concerns not nature but only the relations between humanity and the other living elements usually known in any given culture as 'nature'.

- The time aspect seems to play a role in the establishment of these processes. It is therefore essential to take this into account, since the processes are set within and thus can only be understood within this dimension or, in other words, on this type of scale. The more-or-less radical eradication of the forest is always temporary. Deconstruction and reconstruction follow one another, but there is no single pattern. On the contrary, each type of conversion seems to follow a specific pattern determined by the initial situation that triggered the process. However, the most interesting aspect is the unplanned, experimental and innovative adjustments made in certain cases of post-pioneer reconstruction.

Through the questions and hypotheses they prompt, the last two points could be possible lines of research for understanding not 'forest dynamics' but the relations between communities and forests in future.

We have stressed the importance of the contexts in which forest conversion processes occur in tropical regions. When looking at this on a global or more precisely a historical scale, they are seen to correspond to the pioneer phase of what is now known as 'globalization': the colonial period and its protraction. Despite its late occurrence, forest colonization in Indonesia and Amazonia is still part of this historical period. In both colonial and independent Côte d'Ivoire and current-day Indonesia or Brazil, the central authorities have made forests a political resource. Depending on the situation, they have served to confirm state power (colonial Côte d'Ivoire); prevent difficult social and land reform (Brazil); enable primitive accumulation of capital by the governing oligarchies (Indonesia); and as a means of generating and controlling the political redistribution of different types of financial income (Côte d'Ivoire).

However, this historical period is apparently drawing to a close and the proprietary use of forests by the state has run up against a dual barrier: the physical barrier of the forest, which is now largely occupied, and that of international pressure in favour of forest protection. We can thus reasonably assume that the future pattern will primarily be that of the second phase of the conversion process: reconstruction.

In this respect, the second possible line of research concerns these afforestation practices, which have as yet only been described in a small number of cases, but which are increasingly common if one looks more closely. Over and above the academic distinction made, for instance by A. G. Haudricourt (1962), between '*ager*' and '*orthus*' oriented agro-eco systems, the questions

raised by these practices mostly remain unanswered. We are beginning to understand that far from being a transitional stage in a shift towards agrarian systems, these modes of management and usage are in fact deliberate, long-term 'intermediate' systems (Angelsen et al., 2000). While this sustainability is obvious, it is not yet fully understood. Moreover, this type of solution is apparently restricted to specific regions and situations. In what way and in what environmental and also political, social and cultural contexts are they a relevant solution? They run counter to the dominant productivist trend and the interest they hold for the farmers that practise such systems does not only lie in their economic advantages. According to the studies carried out (Indonesian agroforests, Guinean village woodlands, Chaggas gardens in Tanzania), the populations concerned are apparently looking to reconcile the resilience of the agro-ecosystem (minimum human intervention) and social reproduction (optimization and organization of the transmission of a productive heritage from generation to generation). These practices therefore correspond to a post-pioneer stabilization phase in terms of the relations between these communities and the forest components of their environment.

## NOTES

1. See the corresponding references. Amazonia: Léna (1999); Madagascar: Moizo (1998); Indonesia: Michon (2002).
2. In addition to the seven case studies presented in 'La forêt monde en question. Recomposition du rapport des sociétés à la forêt dans les pays du sud' *Autrepart*, Vol. 9, 1999, Editions de l'Aube, IRD (in French), concerning Niger, Côte d'Ivoire, Tunisia, Nicaragua, Brazil and Indonesia, other case studies, particularly in Indonesia, Tanzania, Guinea and Madagascar were also taken into account.
3. See the re-evaluation of the statistics for West Africa suggested by Fairhead and Leach (1998).

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# Beyond Tropical Deforestation

From Tropical Deforestation  
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