

## 9. Key findings and reflections

In the late 1980s the idea gained ground that stimulating trade in non-timber forest products (NTFPs) would benefit both conservation and rural development objectives. Since then many researchers have studied the production and trade of NTFPs, but they have tended to use different methodologies and definitions and understanding of the potential of NTFP trade beyond the case study level remained limited.

The overall research question I aimed to answer in this dissertation was, ‘To what extent, and under which conditions does commercial NTFP production contribute to conservation and development objectives?’ I used two highly differentiated but complementary methods to explore this question. First, being a member of a research team at the Center for International Forestry research (CIFOR), I conducted a meta-analysis of the effects of NTFP trade on livelihoods and the environment in a wide range of cases – known as the global outcomes assessment.<sup>1</sup> Second, building on the results of the global outcomes assessment, I zoomed in on one particularly successful case to explore conditions and opportunities of commercial NTFP production in greater depth.

With regard to conservation, I found that stimulating trade of NTFPs that are extracted from natural forest is not likely to provide an incentive for natural forest conservation. Although cultivated NTFP systems provide fewer environmental functions than natural forest, they tend to provide more environmental functions

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<sup>1</sup> To improve the understanding of the potential of NTFP trade above the level of individual case studies, the Center for International Forestry Research (CIFOR) initiated a research project to compare a wide range of cases. In the first phase of the project a typology of cases was developed (see Ruiz Pérez *et al.* 2004 and Belcher *et al.* 2005a). In the second phase the outcomes of trade on livelihoods and the environment were assessed. As a CIFOR research fellow I worked on this part of the project – known as the ‘global outcomes assessment’ – and it forms the basis of this dissertation.

than their land-use alternatives. Hence, although NTFP trade may not provide an incentive to conserve natural forest, it may provide an incentive to establish or maintain tree-based systems which deliver environmental services in agricultural landscapes.

With regard to development I found that, while NTFP extraction from natural forest is important to prevent people from falling deeper into poverty, it has limited potential to lift people out of poverty. NTFP cultivation, on the other hand, may actually contribute to rural development, but is only attractive under certain conditions, i.e., when markets are accessible and secure, and people have control over their lands. Hence, the potential of NTFP trade to contribute to rural development depends to a large extent on these context variables.

The support of agroforestry practices seems particularly promising as regards delivering balanced trade-offs between livelihood and environmental benefits. Whether agroforest systems are maintained over time depends on a combination of risk-spreading motives, local traditions, tenure security and economic profitability compared to available land-use alternatives. Agroforests have onsite and offsite environmental benefits compared to other agricultural systems, but the development of such ‘environmentally friendly’ agricultural systems may be at the cost of natural forest. Thus, when conservation of natural forest in protected areas is the objective, encroachment control will often be required.

In this final chapter I first summarise the key findings per chapter. After that, I reflect briefly on these findings and on the lessons that can be drawn for conservation approaches.

## **9.1 Summary**

### *Chapter 1 – Introduction*

In Chapter 1 I described how conservation approaches in the tropics since the late 19<sup>th</sup> century evolved from fortress conservation aimed at separating people from parks into approaches aimed at reconciling conservation and local development objectives. Stimulating trade in non-timber forest products (NTFPs) is an example of the latter approach. The idea that NTFP trade reconciles conservation and development objectives is based on the following three assumptions found in literature: i) NTFP trade is important for local livelihoods and offers opportunities for development, ii) NTFP extraction is more environmentally friendly than land-use alternatives and allows for conservation of key forest values, and iii) increasing

trade of NTFPs will add value to the standing forest, and will provide an incentive for local people to conserve the forest. Based on these assumptions, supporting non-timber forest product (NTFP) trade became a popular conservation approach in the 1990s, often as part of Integrated Conservation and Development Projects (ICDPs). The NTFP approach aims to make markets work to the benefit of both poor people and forest conservation, and includes elements of a neo-populist discourse, as it emphasises the role and potential of local people.

### *Chapter 2 and 3 – Global outcomes assessment*

Chapter 2 presented the methods for the global outcomes assessment, which was developed as part of CIFOR's global case comparison project and which aimed to identify which types of cases are associated with positive or negative outcomes for livelihoods and the environment. For the assessment of livelihood outcomes, the Sustainable Rural Livelihoods framework was used to identify indicators to capture changes in financial, physical, natural, human and social assets at household and community levels. To assess the environmental impacts of commercial NTFP production, indicators were selected at three levels, i.e., the target species population, the land-use ecosystem, and the landscape. The actual assessment was based on judgments by case researchers regarding the effects of NTFP trade on these indicators in their cases. The method was implemented for a total of 55 cases from Asia, Africa, and Latin America.

Chapter 3 presented the analysis of the outcomes assessment. The analysis was guided by the following three research questions: (i) How does NTFP trade influence access to livelihood assets? (ii) What are the environmental outcomes of NTFP trade? (iii) Which case characteristics are associated with positive and negative livelihood and environmental outcomes?

Regarding the first question I found that NTFP trade benefits several components of peoples' livelihoods – both directly (through increased cash income) and indirectly (e.g. when trade results in improved information and skills). Trade tends to have positive effects on financial, physical, human and social assets, but does not always have positive effects on inter and intra-household equity and access to natural assets. The outcomes for one particularly critical indicator, i.e., whether or not money earned with NTFP trade is invested in NTFP production or other productive activities, are not encouraging. In 80% of the cases, the commercial production of NTFPs does not enable people to make financial investments to increase quality and quantity of production, limiting the potential for development.

Regarding the second question the outcomes assessment showed that NTFP trade often leads to depletion of the target resource species when the NTFP is harvested from the wild without further management. In these cases NTFP trade tends to have only limited effect on the environmental functions of the land-use ecosystem because the maintenance of the land-use ecosystem seldom depends on the value of the NTFP. In cultivated cases the land-use ecosystem provides fewer forest functions compared to natural forest. However, NTFP cultivation systems tend to provide more forest functions compared to their most likely land-use alternatives<sup>2</sup>. Likewise, at landscape level, almost all cases have positive outcomes, meaning that NTFP production systems tend to contribute positively to environmental functions in the landscape.

With regard to the third question, I found that in cases characterised by far-away markets, insecure tenure and limited infrastructure, the potential of NTFP trade to contribute to rural development is limited. These are the remote locations where people live in or near natural forest and are largely subsistence oriented. Here NTFP extraction provides one of the few sources, or sometimes the only source, of cash income and may therefore be extremely important when it comes to making ends meet. Selling NTFPs in times of need helps prevent people from falling deeper into poverty (poverty mitigation). However, in such a context, NTFP trade may not provide sufficient income to lift people out of poverty (poverty elimination). Moreover, it does not act as an incentive for natural forest conservation. Often people do not control the land from which they harvest the product. Even if they have some form of access rights, there may still be legal or practical limitations to people's land-use options. In those cases that are characterised by large and accessible markets and secure tenure, it may be feasible for people to specialise in cultivation, with higher livelihood benefits. The resulting production systems are more like agriculture and less like forests. Consequently, higher livelihood outcomes are associated with lower environmental outcomes, and vice versa.

Of the 55 cases that were included in the global outcomes assessment, the case of the *damar* agroforests in the Krui area in Sumatra, Indonesia represented the most balanced trade-off between conservation and development outcomes. Here farmers specialised in the cultivation of a commercially valuable NTFP, but specialisation did not result in a monoculture plantation. Instead the NTFP is cultivated in a

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<sup>2</sup> The most likely land-use alternative is the land use that would most likely occur if the NTFP target species were not to have any monetary value. Often alternatives already exist in the regional landscape, and the most realistic one is the land-use system that would be most attractive to the relevant decision maker. For example, the resin-producing agroforests in the Krui area in Sumatra, Indonesia, will be converted to oil palm or short-term perennials, if the resin would lose its commercial value.

diverse agroforest that mimics natural forest. This case was the focus of attention in the second part of the dissertation. It was used to explore the role of tenure security and dynamics over time.

#### *Chapter 4 and 5 – Introduction to the case study*

Chapter 4 presented an introduction to forests, forest use and forest governance in Indonesia – the country with the third largest area of tropical natural forest in the world. Indonesia's forests have been dwindling in recent decades due to a combination of unsustainable logging practices (driven by overcapacity in pulp and paper industry), plantation development (oil palm in particular), forest fires and agricultural encroachment. The state claims ownership of most of the country's forest resources. Under Suharto (1967- 1998), the central government started the large-scale industrial exploitation of the natural resources by leasing out large parts of the 'state forest zone' to logging and plantation companies. Local communities were denied access to these areas and this led to conflicts between communities and state-supported commercial interests. Some of these conflicts started when lands that were managed by agroforest farmers were suddenly claimed by industrial interests. This also happened in the Krui area in Sumatra. Here, the government (pressured by a consortium of NGOs and research institutions) made a first attempt to resolve such conflicts in 1998 by issuing a special decree that allowed communities to apply for special user rights over the agroforests located in the state forest zone.

Chapter 5 introduced the Krui area, the *damar* agroforest system, and the methods used in the case study. The Krui area is located in the district of West Lampung, at the south-western tip of Sumatra. The area is internationally famous for its complex agroforests, which consist of a mixture of *damar* (*Shorea Javanica*) and other useful trees. The *damar* tree yields a commercially valuable resin that can be harvested throughout the year. The *damar* agroforests are relatively close to natural forests in terms of structure, function, dynamics and diversity, and appear as large forest massifs. The agroforest zone borders the Bukit Barisan Selatan (BBS) National Park – the third largest national park in Sumatra – and functions as an extension of the habitat of many species in the park. Because of this apparent environmentally friendly land-use system, the Krui area attracted a lot of attention from researchers, particularly in the 1980s and 1990s, and the Krui agroforest became widely known as a showcase example of successful NTFP domestication. However, after the much applauded government decree of 1998, not much research was performed to monitor the developments in the area. Between October 2004 and May 2005 I conducted a field research to study what had been

the impact of the decree, and to study to what extent livelihoods and land-use systems were changing over time.

To study dynamics over time (in terms of land-cover and in terms of incomes) I used two quantitative methods: an analysis of land-cover changes through interpretation of satellite images of 1997 and 2002, and a comparison of household income data of 1995 and 2004. For the latter comparison I had access to household income data over 1995 that had been gathered by CIFOR colleagues with a household survey in three Krui villages in 1996. I repeated the survey in the same villages in 2005 (gathering data over 2004). During field research in 2005 I also employed qualitative techniques, i.e., participatory mapping exercises and a wide range of in-depth and group interviews.

### *Chapter 6 – The impact of the KdTI-Krui decree*

Under President Suharto the *damar* agroforests located within the state forest zone in the Krui area became threatened by state-supported industrial interests. As a result, farmers stopped investing in their land-use system and this jeopardised the future of the agroforest system. A decree – known as the *Kawasan dengan Tujuan Istimewa-Krui* (KdTI-Krui) decree<sup>3</sup> – issued by the Indonesian government in 1998 was meant to provide the farmers with tenure security so that they would continue their agroforest practices. Because tenure security is widely considered to be a key condition for successful NTFP domestication I decided to study the impact of the KdTI-Krui decree in Chapter 6.

I analysed the question, ‘What are the effects of the KdTI-Krui decree on tenure security and land-use practices in the Krui area?’ I found that the 1998 KdTI-Krui decree had not resulted in *de jure* user rights for local communities because none of the Krui communities had ever formally applied for their rights. However, since the signing of the decree (by which the government essentially accepted the existing land-use practices in the state forest zone) the government stopped supporting expansion of industrial activities in the area. As such, the threat of appropriation decreased and this, in combination with support from NGOs and research institutions, helped to restore farmers’ perception of security. The KdTI decree therefore helped to maintain the agroforest land-use system. This finding was confirmed by the analysis of satellite images which showed that total area of mature agroforest had not decreased between 1997 and 2002. In 2005 farmers within the state forest zone felt secure enough to continue investing in their

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<sup>3</sup> ‘*Kawasan dengan Tujuan Istimewa*’ means ‘Zone with Distinct Purpose’.

complex agroforestry systems, while planting trees reinforced their feeling of security. I concluded that it is not the legal status of tenure, but the perception of tenure security that is of significance in people's land-use decisions. However, if *de facto* rights are not backed up by *de jure* rights, they are vulnerable when outside interests (re-)enter the arena.

### *Chapter 7 – Dynamics over time*

The NTFP proposition assumes that commercially viable trade will ensure the continued maintenance of a land-use system that provides forest functions. Successful NTFP trade may, however, lead to changing production systems if people invest in more specialised production, or in alternative land uses. In Chapter 7 I used the survey data of 1995 and 2004 to explore these dynamics. The central question was, 'To what extent, and why, is the importance of *damar* agroforestry changing over time, and how does this relate to conservation of the natural forest?'

Between 1995 and 2004 *damar* agroforests remained the main source of income in the surveyed villages and the area of mature agroforest per household had not decreased. In addition, there were no indications of a move towards monoculture plantations. I identified several reasons for the system's maintenance between 1995 and 2004. First, the agroforest's returns to labour and land had remained attractive compared to land-use alternatives such as coffee and pepper cultivation. Second, in villages with a longstanding history of agroforest management, its maintenance was considered a moral obligation towards both past and future generations. Third, the diverse *damar* agroforests are not only a source of monthly income from the sale of resin, but provide many other products for subsistence and commercial purposes, thereby helping to spread the risks.

Though there had been no large-scale conversion of mature agroforests between 1995 and 2004, I found that the option of converting mature agroforest was becoming increasingly attractive because of the rising price and demand of *damar* timber and decreasing resin productivity. At the same time, however, there were no indications of farmers being likely to discontinue tree planting activities in the near future. Planting tree seedlings on recently cleared lands was still common practice in all research villages and farmers are therefore continuing to establish new agroforests.

In the Krui area land is becoming increasingly scarce, but inheritance systems do not result in land division. This leads to mounting agricultural pressure on the national park. Young farmers open new forestlands which, over time, will develop into agroforests. The relationship between agroforest establishment and forest

conservation is therefore somewhat ambiguous. The *damar* agroforests provide environmental functions (e.g. habitat for forest species from the national park) and help limit accessibility of the protected area, but their development does not prevent agricultural pressure on protected areas. Developing new agroforests may imply destroying protected natural forest.

### *Chapter 8 – The non-farm sector's contribution to conservation and development*

In many rural areas in the tropical world the relative importance of the non-farm sector increases under the influence of market integration, improved infrastructure, and higher levels of education and migration. I explored the dynamics of the non-farm sector in the Krui area by comparing household income data from 1995 and 2004, in order to obtain a more inclusive understanding of local livelihood activities and their relationship with forest conservation. The central question was, 'How did the non-farm sector in the Krui area develop over time and what are the consequences for forest conservation?'

In some localities in the Krui area the opportunities to engage in more profitable non-farm activities – both locally and in urban areas – rose with improved infrastructure and education. Nevertheless, the average income from local non-farm activities in the Krui area did not exhibit sustained growth between 1995 and 2004. A large number of young people moved out to urban areas to find jobs. Local income from remittances remained limited, but the non-farm sector in urban areas may have helped to prevent a decreasing per capita income in the Krui area, as out-migration decreased the average household size.

Agricultural wage labour was relatively important for the low-income groups, while non-farm income was relatively important for high-income groups. This finding underlines the distinction between poverty-driven and opportunity-driven diversification. In theory, increased income from the non-farm sector could lead to decreasing pressure on natural resources, for example when rural people abandon farming. I hypothesised that households with relatively high incomes from the non-farm sector would be less dependent on agriculture, and therefore have smaller landholding sizes. However, I found no relation between the relative and absolute importance of non-farm income in the household economy and the size of the landholding. In the Krui area there is no substitution effect between the farm and the non-farm sectors and supporting non-farm activities would therefore not automatically result in reduced pressure on the neighbouring natural forest.

## 9.2 Reflections

### 9.2.1 Methods

The global outcomes assessment method was based on the selection of an easy-to-use and small set of indicators for assessing livelihood and environmental changes. Clearly, the method had its limitations. First, livelihood and environmental changes take place in complex contexts influenced by interventions, trends, events, available resources, institutional processes, and organisational structures. It is often unclear how outcomes are directly or indirectly related to other factors and it is therefore virtually impossible to identify the exact weight of the different factors that contribute to a particular change. Second, the assessment relies on the knowledge and experience of the research collaborators. To assess livelihood outcomes, case researchers were asked to identify causal relations between NTFP trade and changes on indicators. At this level of analysis (per case, per indicator), causality was therefore attributed through interpretation of case researchers and the scoring was only as good as the expert's knowledge and judgment of how NTFP trade affected different aspects of livelihoods in his or her case. In addition, there may have been biases in scoring, for example in relation to the professional background of the case researcher. Detailed guidelines, group implementation and joint field visits helped to reduce biases and to harmonise assessment criteria. Still, it proved essential for a core research team to check all the scores (and their explanations), as to identify misinterpretations and double check ambiguous scores and outliers with the case researchers. Though the method did not allow for much qualitative detail of individual cases, it proved to be an efficient way of obtaining standardised information on the direction of changes, which was then used to explore the contours of larger patterns.

For the Krui research I used a combination of quantitative and qualitative approaches. A lot of information was obtained by repeating a household survey that had been conducted nine years earlier, and by comparing the two datasets to assess changes over time. It is surprising that researchers do not use existing survey data more often. In the field, quantitative and qualitative data was collected simultaneously, with regular cross checking between results from the structured and open interviews. Information from the survey team was analysed further in open interviews and focus group discussions. Likewise, the qualitative data was of great help for the interpretation of the survey data gathered. Survey data can be completely misunderstood in the absence of complementary qualitative information, *and vice versa*. The effectiveness and relevance of the field study benefited greatly from close collaboration with local representatives of NGOs, district government, and farmer organisations, both during design, implementation

and analysis of the research. This ensured that there was constant discussion and information sharing between the research team and other stakeholders.

### **9.2.2 The conservation-development relationship**

In Chapter 1, I mentioned several stereotypical ways of viewing the relationship between forest conservation and poverty alleviation. Some claim that they are complementary objectives, stressing the importance of natural forest for the well-being of rural people and warning against the negative livelihood effects when people lose access to these resources. Others would controversially argue that most people living in and near natural forest would be more than willing to cash in on their forest in exchange for modern consumer goods. This difference in emphasis resonates, to a certain extent, with the difference between poverty mitigation and poverty elimination. Obviously, both are important. The results from the Krui case study underlined the fact that researchers interested in people's use of forest resources, should study both the temptations of modernity as well as the strength of traditions and consider both financial and non-financial factors.

Although the relationship between conservation of natural forest and rural development (defined as increased access to financial, physical, social and human assets<sup>4</sup>) will differ from place to place, the findings presented in this dissertation suggest that the relationship tends to be characterised by trade-offs. In remote areas with limited infrastructure, weak tenure security and limited access to markets, people often lack the opportunity to cash in on the natural resources that are available. Keeping natural forest remote may therefore be the best conservation strategy, although remoteness hampers development. Likewise, improving market access and infrastructure will increase development opportunities, but is likely to increase pressure on the natural forest (*cf.* Wunder 2001).

In the global outcomes assessment, the environmental outcomes showed a much wider variability than the livelihood outcomes, and negative outcomes were more common in the environmental sphere than in the livelihood sphere (see, e.g. Figure 8 in Chapter 3). This may explain why it is primarily within the conservation community – or at least within the neo-preservationist section of that community – that the compatibility of conservation and development outcomes is increasingly being questioned.

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<sup>4</sup> Some may question whether human welfare is associated with such processes of accumulation, but this discussion is beyond the scope of my dissertation.

### 9.2.3 NTFP production to reduce vulnerability

Although poverty and vulnerability are not the same (Chambers, 1989), poor people tend to be more vulnerable to adverse events, which can be natural, socio-economic, or political in nature. Poor people try to reduce their vulnerability to adverse events through the use of insurance strategies. There are different types of insurance strategies, e.g. risk spreading, and increasing buffer capacities. The more effective a household's insurance strategies are, the more likely it is to cope with adverse events or seasonal shortages. Insurance strategies are adopted in anticipation of adverse events, while coping strategies are adopted in response to adverse events (*cf.* Dietz and Van Haastrecht, 1997). Both strategies help to achieve a higher level of livelihood security (preventing people from falling deeper into poverty) and are therefore important elements of poor people's livelihood strategies.

NTFP extraction from natural forest is often part of people's 'seasonal coping strategies', i.e., people turn to the extraction of NTFPs from natural forest when faced with seasonal shortages that are to some extent expected. When NTFP extraction from natural forest takes place in response to a sudden unexpected severe crisis, it can be labelled a 'genuine coping' or 'survival' strategy (see Van der Geest and Dietz, 2004, for an elaboration of these terms).

The cultivation of NTFPs in diverse agroforest systems generates more opportunities for livelihood improvement (or *poverty elimination*) than NTFP extraction from natural forest, but may also have important insurance (or *poverty mitigation*) functions. Diverse agroforest systems produce a range of commercial and subsistence products which help to spread risks and reduce farmers' vulnerability to adverse events such as a crop disease or price fluctuations. The maintenance of diverse agroforest systems can therefore be considered an element of farmers' insurance strategies. Mature *damar* agroforests, for example, provide secure monthly income through the sale of resin, a saving account in the form of timber (which can be turned in in times of unexpected need), access to fuel wood and vegetables for subsistence purposes, and access to fruits for both subsistence and commercial purposes.

### 9.2.4 Diverse agroforest systems for biodiversity conservation

The studies presented in this dissertation suggest that diverse agroforest systems can provide a reasonable trade-off between conservation and development outcomes. This is in line with new conservation approaches that have been gaining ground in recent years which emphasise the role of agricultural systems in providing environmental functions in landscape mosaics. The general idea, in line

with ‘new ecology’ thinking that was introduced in Chapter 1, is that the provision of environmental functions (biodiversity conservation in particular) is not limited to protected natural forest (e.g. Scherr and McNeely, 2003; Van der Meer and Perfecto, 2007). Scherr and McNeely (2003) use the concept of ‘eco-agriculture’ to refer to land-use systems that are managed in order to provide both agricultural products and environmental services. According to them, eco-agriculture includes two main strategies: i) increasing wildlife habitat in unfarmed patches in agricultural landscapes; and ii) enhancing environmental functions of farmed lands. Agroforestry practices figure prominently in such landscape approaches as they can help conserve biodiversity by providing habitat for wildlife and provide corridors between remnants of natural forest (*cf.* Schroth *et al.*, 2004).

The Krui case made clear that this approach introduces new challenges and tensions. First, though agroforest systems can be attractive (for both financial and non-financial reasons), people are likely to decide to discontinue agroforestry activities when more profitable alternatives become available. Second, though diverse agroforests provide certain environmental functions, they do not prevent encroachment on remnant patches of natural forest, particularly in situations of high population densities. The challenge for conservation agencies is thus two-fold: i) increase the returns to land of ‘environmentally friendly’ forms of agriculture such as agroforestry; and ii) protect the remaining natural forest. However, tensions between environmental and livelihood considerations will often remain. As Russell *et al.* (2006: 20) write, “*Conservationists like indigenous trees and large mammals but farmers often like fast-growing exotics and do not like large mammals — or even small ones — in their fields or plantations.*”

Some conservationists have expressed other views, suggesting that investing in intensive and modern agricultural production will in the end be most beneficial for conservation as it requires less land (e.g. Green *et al.* 2005). Which mode of agriculture provides the best trade-off between development and conservation objectives is a relevant question in the light of the emerging food and energy scarcities – which implies increased demand for agricultural products – and the growing call for investments in the agricultural sector in developing countries.<sup>5</sup> While this is sometimes treated as an either-or question, in reality the ‘ideal’ mode of agriculture is likely to vary from case to case. Surely, in cases where existing agroforests already provide a significant part of the habitat of forest species, it

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<sup>5</sup> Professor Sir David King, president of the British Association for the Advancement of Science, claims that, by supporting ‘indigenous’ and ‘organic’ agriculture and rejecting modern technologies (such as genetic technologies), western NGOs are effectively hampering the improvement of millions of lives in Africa (The Times Online. September 8, 2008. Green activists ‘are keeping Africa poor’ online [URL]: <http://www.timesonline.co.uk/tol/news/environment/article4699096.ece>

seems most appropriate to direct efforts towards increasing the returns to land while maintaining the environmental functions of the land-use system.

### **9.2.5 An anthropocentric approach based on an eco-centric worldview**

The NTFP approach fits in with the dominant conservation discourse of the 1990s which emphasised the role of local people in conservation efforts and which can be labelled ‘populist’ (Adger *et al.* 2001), ‘neo-populist developmentalism’ (De Haan 2000) and ‘eco-populism’ (Dietz 1996). Local people are portrayed as the victims and potential heroes, while outside actors (e.g. plantation companies and loggers) are the villains.

I have already shown that the assumptions underlying the NTFP approach are not always valid and I would argue that the approach may have been ‘misleading’ in three additional ways. First, though the NTFP proposition acknowledges that people’s livelihoods have multiple dimensions and that people will choose the land-use option that is most attractive, in practice NTFP-based projects may have been rather one-dimensional. By focusing exclusively on NTFP production and trade, projects may have lost sight of the other livelihood dimensions and local priorities. Agricultural expansion at the cost of natural forest (jeopardising NTFP production) is a case in point. I would argue that one of the reasons for the disappointing results of NTFP-based ICDPs can be found in their one-sided and biased approach, focussing only on NTFPs, while failing to take account of the role of agricultural and non-agricultural activities in household economies.

Second, though NTFP-based approaches seem to be based on a view of local people as economically rational actors (after all, the fundamental reasoning is that people will conserve the forest if it is more profitable than converting the forest), the enthusiasm with which the approach has been embraced by practitioners and academics reveals elements of a stereotypical view of local people living in harmony with nature. It has often been presupposed that, if given a choice, poor people living in or near forests would prefer to leave the natural forest standing.

Third, though the NTFP-based approach seems to be based on an anthropocentric worldview, I would argue that it is an anthropocentric approach based on an eco-centric worldview. It is eco-centric as the approach was born out of the interest in biodiversity conservation. The initial question was how to conserve biodiversity in natural forests and not how natural resources can be used to improve the welfare of people living in and near forest. NTFP advocates may have been so eager to believe that commercial NTFP production can provide an incentive for natural

forest conservation that they failed to acknowledge that this is often not true and that forests may sometimes be poverty traps.

**Box 9.1. Preservation and compensation**

Neither the support of NTFP cultivation in agroforest systems nor the support of the non-farm sector will automatically reduce pressure on the remaining natural forest. In areas with relatively high population densities, the conservation of protected areas will therefore often require prevention of encroachment and illegal logging. In an ideal situation, local earnings that stem directly from preservation (e.g. through eco-tourism or payments for environmental services) are higher than those from land-use alternatives. However, when such direct payments are non-existent, insufficient, or unequally distributed, preservation implies that people's livelihood options are restricted and will only be accepted when the foregone opportunities are compensated. Compensation, however, presents a problem. Research by Wittemyer *et al.* (2008) has shown that investments in communities near protected areas (e.g. providing schools, roads, clinics, and other services) attract more people, leading to extra pressure on the protected area. Preservation *without* investments in the local economy would therefore be more efficient from the conservation point of view. However, in addition to the increased probability for park-community conflicts, preservation without compensation raises political and moral questions. The combination of preservation of a protected area with investments in the local economy is not a new idea. Promoted by NGOs it has been a basic element of numerous Integrated Conservation and Development Projects (ICDPs). Such investments fail when based on a naive belief in conservation and development as complementary objectives and when based on a simplistic understanding of local livelihoods (e.g. introducing alternative livelihood activities that do not match existing livelihood strategies) and the local context (e.g. setting up eco-tourism projects in areas with neither infrastructure nor tourist potential). An equally important aspect is that such investments will only contribute to conservation when they are part of a deal that commits the community to stopping encroachment into the protected area. Acknowledging that communities are heterogeneous, with different interests and levels of power, deals would need to be based on negotiations with all local stakeholders at the table. Common priorities and overlapping interests (e.g. shared environmental values) would need to be identified. Agreements should include rules, monitoring mechanisms, targets and sanctions, and the possibility to hold people and institutions accountable. There are no guarantees that all parties will remain committed to such an agreement over time, but the chances of the socially acceptable conservation of protected areas succeeding will increase when preservation, compensation and community involvement are part of the same package.

### 9.2.6 Policy implications

The research results included in this dissertation have various policy implications. Below I mention the main recommendations for policy makers and practitioners who are involved in conservation issues.

#### *Seek trade-offs*

First and foremost, policy makers and practitioners working in conservation would need to accept that there is often a need to negotiate trade-offs between conservation and development objectives – only then realistic interventions can be formulated. Interventions that seek trade-offs are likely to be more successful than those that pretend to present win-win solutions.

#### *Prevent appropriation of forest resources by outsiders*

Supporting trade in NTFPs collected from natural forest should not be regarded as a key intervention area since it is likely to bring only modest livelihood benefits, may lead to overexploitation of the target resource and will seldom provide incentives for natural forest conservation. In remote locations where people use wild products to make ends meet, NTFP-related interventions are better directed at preventing appropriation of forest resources by outside interests, as to ensure that people do not lose access to these resources.

#### *Support establishment and maintenance of agroforest systems*

Supporting the domestication of NTFPs on agricultural lands in tree-based agricultural systems – complementary to natural forests – is a promising strategy when it comes to balancing conservation and development objectives. The extent to which agroforest establishment is indeed an attractive option for local people depends on a range of factors, e.g. market access, prices, (perception) of tenure security, establishment costs, land-use history and traditions, land availability, and available alternatives. Payments for Environmental Services (including carbon sequestration) may offer new chances for agroforest farmers. There may also be opportunities to produce biomass for bio-energy in agroforest systems, but this requires more research.

*Provide incentives for selective timber harvest from agroforest systems*

When trees are harvested selectively for timber by small-scale agroforest farmers, the difference between timber and non-timber products becomes less meaningful.<sup>6</sup> When prices and demand for timber are high, the selective harvesting and replanting of timber can help to increase returns to land, without compromising the agroforest's environmental functions. Incentives would need to be devised to prevent clearcutting for immediate cash, and to promote selective harvesting of timber. Efforts aimed at maintaining or increasing the value of the production of NTFPs from the agroforest will help to prevent clear cutting. In addition, making financial credit accessible to farmers will help reduce the temptation to clearcut the agroforest to get immediate large sums of money to purchase expensive goods.

*Consider local differentiation*

Due to differentiation within communities, interventions to increase the returns of agroforest systems are likely to benefit some more than others. For example, some groups in the Krui area do not own mature agroforest, i.e., recently settled migrants and young farmers who did not inherit mature agroforest. These are the farmers who are cultivating new fields in the forest margins, often at the expense of natural forest. Intervening institutions would have to be aware that these groups would not directly benefit from interventions designed to increase the income from the agroforest.

*Do not use blue-print concepts but start from local problems and opportunities*

The Krui case highlights the fact that any intervention aimed at increasing the returns of NTFP production systems should start from an in-depth understanding of the local context and local particularities, rather than blue-print concepts. Therefore, interventions should preferably be developed in close collaboration ('partnership') with resource managers (the farmers), researchers and other stakeholders (*cf.* Ros-Tonen *et al.* 2008) in a dynamic and adaptive process (*cf.* Sayer and Campbell 2004).

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<sup>6</sup> For considerations regarding the usefulness of distinguishing timber from non-timber see e.g. Ruiz Pérez and Arnold, 1996; Belcher, 2003; and Wiersum and Ros-Tonen, 2005.

*Design tenure arrangements that account for multiple perspectives*

Decision making regarding tenure arrangements implies moral considerations, i.e., do certain environmental considerations justify the restriction of land-use options for people?<sup>7</sup> When designing new tenure arrangements, it is up to the decision makers to answer such questions, but they would need to do so by taking into account the perspectives of all stakeholders.

*Protect insurance functions of NTFP production*

NTFP extraction from natural forest and NTFP cultivation in diverse systems both help to reduce people's vulnerability. If a farmer relies on a lot of forest products as part of a risk spreading strategy, efforts designed to stimulate specialised production of a particular species may compromise the farmer's flexibility and increase the vulnerability to price fluctuations and production failures. When designing interventions aimed at increasing income from NTFP extraction or cultivation, care should be taken that insurance functions are not threatened.

*Design carbon-based tools for conservation based on realistic assumptions*

The enthusiasm with which the carbon market is currently being embraced as a new opportunity to reconcile conservation and development objectives is comparable to the enthusiasm with which the NTFP proposition was embraced in the 1990s (although the current carbon hype is much bigger). Enthusiasm for both approaches is largely based on the assumed potential to contribute to biodiversity conservation. Based on the NTFP experience, lessons can be drawn for the development and implementation of carbon-related tools for forest conservation. In line with the original NTFP proposition, the price of the carbon stored in natural forest may provide an incentive for forest conservation. Indeed, even though the carbon market is a tool to mitigate carbon emissions, it is tempting to see it as a tool for the conservation of natural forest. However, similarly to tangible NTFPs, the 'production' of carbon does not depend on the maintenance of natural

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<sup>7</sup> Chapter 6 analysed the impact of a policy that was designed to allow local communities to reap the benefits of managing forest resources while prohibiting conversion of these resources. Some would applaud this type of regulation, arguing that prohibiting the conversion of agroforests is not only desirable from the perspective of biodiversity conservation, but will also benefit local communities because they help to prevent erosion and maintain a healthy hydrological system. Others would reject such an arrangement because it restricts the available land-use options for local people. They would claim that the arrangement is really about protecting the habitat of certain forest species, while this may not be a priority for local communities.

forest. Other tree-based systems, including monoculture plantations with fast growing tree species, also capture carbon. As a consequence, the development of a carbon market will not automatically safeguard natural forest. Through payments for avoided deforestation (also known as Reduced Emissions from Deforestation and forest Degradation – REDD), the carbon market can directly be linked to the maintenance of natural forest, offering possibilities to finance natural forest conservation. At the UN climate conference that was held in Bali in December 2007 it was agreed to include REDD in the discussions on a new global warming treaty to be signed in Copenhagen in late 2009. One of many challenges associated with such schemes is to ensure that local people benefit. Similar to many tangible NTFPs, opportunities for people in remote areas to benefit from the carbon market will depend on external support, and are associated with high organisational costs. Moreover, as has happened in the case of the NTFP approaches, there is a risk of losing sight of local livelihood realities in remote forested areas and the underlying causes of deforestation.

### **9.2.7 Final remarks**

I conclude with two short observations. First, in academic circles, interest in ‘conventional’ NTFPs has been waning in recent years, not least because of the disappointing results of NTFP-based approaches (often as part of ICDPs) to contribute simultaneously to conservation and development. During field trips in Southeast Asia between 2002 and 2006, however, I noticed that practitioners and government officials in the field had often uncritically accepted the validity of the three assumptions underlying the NTFP proposition. In this way, supporting NTFP trade had become a ‘textbook blueprint approach’. I interpreted this as an example of both the time lag between the emergence of ideas within the walls of research institutions and their uptake on the ground, and the risk of apparent win-win concepts being implemented without much attention to the local applicability.

Second, the NTFP experience has taught us that there are no silver bullets with which to reconcile conservation and rural development. Preservation, sustainable use of natural forests, agroforestry, agricultural intensification, payments for environmental services (like REDD) and non-farm sector development all play a role. Markets based on the utilitarian value of forest products and services may be useful tools to motivate continued production of these products and services. However, as long as there is no functioning market for the intrinsic value of biodiversity, market-based approaches do not automatically serve the objectives of conservation organisations.