

An Investigation into the Drivers of Forest Encroachment in Bi Doup-Nui Ba National Park

Report to WWF Greater Mekong – Vietnam Country Programme
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1. Introduction

1.1 Bi Doup-Nui Ba National Park

Bi Doup-Nui Ba National Park is a newly established national park, which converted from nature reserve¹ status in 2005. Located in the north of the Lang Biang plateau, a known centre of high biological diversity within Vietnam, the park comprises a 64,800 ha core zone and 32,300 ha buffer zone. At elevations above 1,400 m a.m.s.l.², the national park possesses typical vegetation types for an area of high altitude in a subtropical climate, such as: sub-, lower and upper montane tropical evergreen closed-canopy forests, mixed coniferous and broadleaved forests, dwarf ‘elfin’ and bamboo forests (Bi Doup-Nui Ba National Park, 2008). Biodiversity inventories have revealed 91 plant species endemic to the park, 62 of which are listed in the IUCN Red List of Threatened Species (IUCN, 2009). For many of these species, Bi Doup-Nui Ba represents the type locality. 26 of the diverse faunal assemblages are also listed as globally threatened with extinction (IUCN, 2009). The park is comprises part of a global Endemic Bird Area (Stattersfield *et al.*, 1998), constituting three Important Bird Areas (Tordoff, 2002). In addition to high biodiversity conservation value, the forests of the park provide important catchment protection for major drainages of the Da Lat Plateau: the Da Nhim River system, major tributary of the Dong Nai River; and the Krong No River, tributary of the Srepok River (unique in Vietnam as the only river flowing west to east into Cambodia to join the Mekong).

1.2 Outline socio-economic context

The park encompasses a single commune, Dachais, within which four villages are located: two within the core zone (Dong K'Si and Klong Klang) and two (Dong Mang, Dung Tupoh) within the buffer zone, adjacent to State-managed protection forests. All four villages were established in the early 1980s, 20 years prior to the park's establishment. The inhabitants of these villages are almost entirely (95 %) of the K'ho ethnic minority, with the Vietnamese Kinh ethnic majority comprising the local minority (5 %). Villagers are predominantly (90 %) commercial coffee farmers who also grow a number of subsidiary crops for both sale (e.g. persimmon) and subsistence (e.g. corn) purposes. Forest resource use is limited primarily to collection of commercial non-timber forest products (NTFP) (e.g. ornamental orchids).

1.3 Forest protection contracts

An increasingly significant source of household income, and incentive for community forest protection efforts, is also derived from contractual compensation for contributions to ecosystem service (catchment protection) provision. Since 2000, forest protection contracts, for forestland inside the

¹ Established in 2004.

² The two highest eponymous peaks being Bi Doup, in the east of the park, at 2,287m a.m.s.l.; and Nui Ba, in the west, at 2,167m a.m.s.l.

park's core zone³, have been issued to local households, initially under the national Five Million Hectare Reforestation Programme (5MHRP)⁴. Beginning in 2008, 5MHRP forest protection contracts are being replaced with annually renewable contracts, signed between individual households and the national park's management board, utilizing funds allocated by the provincial Forest Protection and Development Fund (FPDF). Currently, VND 290,000/ha/year is paid to contract-holders from revenue raised (paid into the FPDF) from fee-paying State water⁵ and hydroelectric⁶ companies, with individual households contracted, on average, to protect 30 ha national park core zone forest. Although the contracting is to individual households, villages informally collectively manage the contractual responsibilities (e.g. patrolling) and resultant benefit sharing through the establishment of 'forest management groups'. Lam Dong provincial Department of Agriculture & Rural Development is planning to increase the forest area under protection contract from 2010 onwards.

1.4 Agricultural encroachment – a statement of the problem

Intensely increasing and diversifying demands on limited available land has resulted in conflicting and competing land use in the park's core and buffer zones. Despite legal tenure of original agricultural lands, which predates the park's gazettement, continued expansion of cultivated land has been illegally encroaching on State-managed forestland, both inside the national park and adjacent protection forests. In an attempt to limit further expansion of agricultural land within the park's core zone, over the past year, park management has instigated demarcation activities (by means of painting trees) along the interface between (illegally) established fields (and in some cases, settlements⁷) and the forest of the core zone. This enclaving of established agricultural lands, of *de facto* (but not *de jure*) tenure is a priority activity of the three park ranger stations that are directly manage the surrounding national park forestland on a day-to-day basis.

The purpose of this study is to evaluate the underlying drivers of encroachment in the park (and adjacent protection forests) as a first step in a process to conduct a participatory boundary-marking exercise designed to reduce future encroachment and conflict between the park's conservation objectives and local peoples' livelihoods.

2. Methods

Three methods were used to obtain information from a sample of 36 households from three of the four villages⁸ in Dachais commune:

³ The situation in the Central Highlands, where it is permissible to issue forest protection contracts for special-use forests (protected areas), differs from that of the rest of the country in that, where forest protection contracting is limited to protection and production forests (see details see Prime Ministerial Decision No. 304/2005/QD-TTg, dated 23.11.05, on the Pilot Allotment of Forests and Contractual Assignment of Forests for Protection to Ethnic Minority Households, Communities in Hamlets and Villages in the Central Highlands Provinces).

⁴ Prime Ministerial Decision No. 661/QD-TTg, dated 29.07.98, on Objectives, Tasks, Policies & Organization for the Establishment of Five Million Hectares of New Forest.

⁵ Dong Nai and Ho Chi Minh City water supply companies

⁶ Da Nhim and Dai Ninh hydroelectric factories

⁷ c. 20 households are now settled, with no legal tenure, on forestland within the park's core zone.

⁸ The fourth village, Dong Mang, was excluded from the survey as it is far (c. 20 km) from the core zone boundary and not known to present an encroachment problem.

1. Semi-structured household interviews - conducted with an adult individual from each sample household, with efforts made to achieve equitable gender balance among respondents. A stratified random sampling strategy was applied with equal sampling from households known to encroach and not known to encroach on forestland. (See Annex I for interview outline)
2. Key informant interviews – using the same semi-structured outline interview (Annex I) as the general household interviews, two to three key informant interviews, targeting village leaders and commune government officials, were also held per village,.
3. Focus group discussions - total of six focus group discussions, comprised of *c.* 10 key informants, such as village leaders, representatives of encroaching households, women, etc., were held; two groups in each surveyed village.

Responses from all three forms of data collection technique were documented in note books, collated, combined with information obtained from focus discussion groups and summarized here (section 3 – Results).

3. Results

Interview and focus group discussion yielded comparable results across all three surveyed villages. Consolidated and synthesized responses are presented here.

3.1 Perceptions, attitudes and behaviours towards forest protection

The majority (90 %) of respondents is aware of, and in agreement about, benefits forest protection offers, namely income through Payment for Ecosystem Service (PES) schemes, which provide significant additional income to previously coffee-based household incomes. Most households claim to participate in forest protection activities, and those that do report a greater sense of responsibility than those households not involved in PES. Cash income from PES appears to be supplanting incentives from poaching and selective subsistence logging, and even coffee cultivation (although quantitative data remain elusive). Villagers claim better forest protection, since 2000, when forest protection contracts were first introduced, as a result of monthly joint community and park ranger patrolling activities, inspection and forest fire prevention activities, the prime responsibilities under PES contracts. Significant improvements in forest protection have yet to be unequivocally demonstrated (quantitatively or even qualitatively); yet income from PES contracts does appear to present a clear incentive for proactive forest protection efforts by local people.

This study indicates that, although local people clearly identify and appreciate the tangible benefit of significantly increased cash income, they do not cite regulatory ecosystem services as a direct major value provided by the national park. Enriching services, such as aesthetic beauty, an asset upon which the local tourism industry is based, was not consistently cited as a principal value of the park and its forests. In terms of provisioning services (products from biological diversity), NTFPs, fuel wood, wild game and timber, are also perceived as being of relative minor value by the commercial agrarian communities encroaching in the park's core zone.

3.2 Perceptions and attitudes towards the national park's impact on local livelihoods

Most (90 %) respondents stated that since the park's establishment, ranger stations and forest protection have been effective in significantly reducing forest crime, e.g. poaching and NTFP (particularly orchid) collection, and in doing so, has had some (unquantified and unqualified) negative impact on livelihoods. A majority (60 %) reported that establishment of the national park had limited the expansion of agricultural land with negative impacts on villager incomes and livelihoods. Furthermore, conflict between local people and park rangers has been exacerbated by the park's attempts at anti-encroachment enforcement activities: reclamation of cleared and cultivated forestland, destruction of newly established coffee plantations within the park's core zone (often without prior notification to the villagers), and fining perpetrating households.

3.3 Perceptions and attitudes towards field-forest boundaries

The majority (80 % interview respondents) of local people clearly identify land covered by natural forest as national park land and non-forested land as extralimital to the core zone. The area of non-forested land is purposefully increased by some local households (see section 3.4 below). Limited demarcation activities have been conducted around some areas of cultivated land within the park's core zone by means of painting trees at the farm-forest interface. Interviewed villagers stated that demarcation efforts to date had not consulted local communities. Local people are fully aware that their agricultural expansion activities illegally encroach on State-managed land, but feel increasing demands (from a growing population aspiring to improve their livelihoods) on limited available land, leave them little choice. They are equally aware that enforcement of park management regulations is not strong, thus the disincentives for encroachment on this land use type are relatively weak (compared to plantation protection forest and privately leased land for commercial enterprise development).

3.4 Characteristics of encroachment

Encroachment within the national park's core zone occurs both at the forest periphery and interior in areas proximal to established villages (i.e. within the ecological rehabilitation functional sub-zone). Cultivation of coffee plantations is attempted only on deforested lands. Land is purposefully and gradually denuded by increasingly sophisticated methods: obvious and slow processes of ring-barking trees have long since been abandoned for inoculation of herbicides or soil (vector for pathogenic micro-organisms) by means of driving metal spikes into the trunks of trees at some height above ground level to avoid detection by forest rangers. Once a break in the canopy has been achieved, a small number (10-20) coffee saplings are planted and then incrementally augmented until a small coffee plantation is established, over some years, inside the national park.

3.5 Reasons for encroachment

From the data collected from these interviews, it is clear that there are two simple reasons why local people encroach on BDND National Park: the presence of a clear and tangible incentive (income from coffee) and the absence of a clear and tangible disincentive (effective law enforcement). Complex and time-consuming procedures, involving numerous government agencies, hamper effective enforcement on the ground. Occasionally, park rangers, frustrated by such delays, do not wait for official procedures to achieve justice and take executive action – uprooting coffee plantations on encroached land and replanting with pine trees – leading to further conflict with local communities.

Law enforcement efforts are further undermined by insufficient disincentives - low level of penal fines compared to levels of household income from coffee farming – those encroaching on the park can afford to pay the fines and continue expansion of illegal coffee plantations. According to park rangers and community forest protection groups, many sanctioning procedures, administered through local government, were abandoned due to households possessing sufficient financial assets to compensate for any fines levied.

3.6 Drivers of encroachment

Four basic drivers of encroachment could be identified from the interview data generated by this survey: declining soil quality of allocated agricultural lands; land-based private sector business development; provincial government land use and socio-economic development policies, plans and programmes (PPPs); and human population growth.

Two principal business activities compete with local communities for limited land in the park's buffer (and, to a limited degree, the core) zone: trout farming and tourism services. Following provincial land use and socio-economic development plans, trout farming began in 2005 on forestland of the core zone; and has subsequently expanded to occupy agricultural land previously belonging to local coffee farmers in the buffer zone. Some interview respondents accused private companies of exploiting local farmers' ignorance and low levels of education to obtain long-term lease contracts, at rates significantly below market value, for allocated agricultural land. According to local villagers, two trout farms have been established in the core zone: one private company and one State-owned aquaculture research station, now fully engaged in commercial farming. The national park management board has now restricted any expansion of trout farming within the core zone, and there are no further trout farms planned for development inside the park.

However, trout farming and tourism services are expanding on protection forestland in the buffer zone (through lease contracts between private enterprises and the Da Nhim watershed management board). As such, these commercial private sector activities are directly competing with forest protection contracts (signed between local households and State forest management boards) as land use options in the buffer zone. Responding to the loss of income from forest protection contracts, villagers turn to increased coffee production, illegally established on the land with weakest enforcement – the national park's core zone.

Rapid local population growth has also contributed to increased pressure on available land allocated to individual households; as families grow, younger generations split from their parents household to establish their own after marriage. Consequently, local villagers call for a revision of government land use plans to allow for greater allocation of agricultural land to expanding communities. With local government not allocating any additional agricultural land to newly-established households, villagers state that they have little option but to encroach on forestland (protection or national park).

Encroachment is not a phenomenon restricted to the forests of the national park; it also occurs in the protection forests of the park's buffer zone managed by the government watershed management board. Here, road (Route 723 to Nha Trang) construction (consuming significant areas of agricultural land),

and associated ribbon development (road-induced ‘land rush’, with urban stakeholders buying up roadside plots, often allocated agricultural land from local farmers, at relatively low prices for future development). Consequently, demarcation issues, not dissimilar to those faced by the park’s management, are also present between private land leasers and local communities in the buffer zone.

3.7 Suggestions for encroachment countermeasures

The self-organised forest protection groups echoed the notion voiced by many interviewees in the focus discussion groups: demarcation, through a participatory processes that raised awareness of local villagers about park regulations, is a priority and pragmatic intervention to prevent encroachment in the core zone. Such a process should be linked to the signing of agreements, between local households and the national park management board, to limit the illegal expansion of coffee farming within the park’s core zone. Participatory demarcation exercises have also been identified by relevant local government agencies (national park management board and its forest protection bureau, together with the Commune Peoples’ Committee) as urgent encroachment countermeasures. A phased approach is advocated of initial piloting in one village, followed by up-scaling to include remaining villages in Dachais and beyond, informed by lessons learnt during the pilot phase.

Villagers also voiced a desire for certified land use rights (‘red books’) for encroached areas that had been cultivated for a long time, claiming that such secure tenure would bestow a greater sense of responsibility on the part of local households to better manage forest resource. In return for more arable land, farmers pledge to cease encroachment on the park. This position is one tenable that the park management board can adopt. Yielding encroached State forestland, or allocating alternative land within the buffer zone, could only be achieved through revision of provincial land use plans, and is, therefore, beyond the management board’s authority. Acquisition of forestland through legal tenure would constitute a major management failure from the park’s point of view.

4. Discussion

4.1 Drivers of encroachment and the ‘tragedy of the non-commons’

The results of this survey, interviewing only one set of key stakeholders, local community members, indicate a complex situation of competing and conflicting land uses in and around BDNB National Park. Multiple stakeholders vying for limited land in the park’s buffer zone may result in complex patterns and interactions of land use, but the reasons for encroachment, from a villager’s perspective are clear and simple: a strong incentive of increased income from greater coffee production, coupled with weak incentives from ineffectual law enforcement on the part of the government.

These basic mechanisms of encroachment are driven by forces emanating internally from the local community (a growing population exhausting the soils of allocated agricultural land), and externally from private and public sectors (commercial business development facilitated by local government policy and planning). With insufficient allocated agricultural land to support a growing population with growing livelihood aspirations, local coffee farmers take the softest option of land acquisition through use. Encroaching on the park, presents a significantly less risky option, as perceived by local coffee farmers, than clearing plantation protection forests or land leased by private companies. BDNB,

in this sense is not unique among Vietnamese special-use forests (SUFs)⁹ that suffer from a scenario of the ‘tragedy of the non-commons’: by prescribing strict no-use management regimes in national regulations, but not being able to implement such prohibitive measures on the ground, BDNB suffers from a ‘closed forest (*de jure*)-open access (*de facto*) syndrome. Under this (‘absentee landlord’) situation of dispersed management responsibility, local villagers have indicated a mindset of ‘if I do not encroach on a given area today, my neighbor will do so tomorrow’.

Of the four identified drivers of encroachment in BDNB, two, provincial PPPs and population growth, are beyond the influence or control of the park’s management board or any project supporting them. The other two drivers, soil degradation and competing land use do present, albeit challenging, possibilities for intervention. Gradual exhaustion of soil nutrients on limited agricultural land of fixed extent could be addressed through introduction of agricultural technologies that restore and maintain soil fertility, e.g. Sloping Agricultural Land Techniques (SALT) (e.g. Swan, 2009), or the environmentally-friendly agroforestry models proposed by the JICA-funded project for Strengthening Community-based management Capacity of Bi Doup-Nui Ba National Park (Kensei, pers. comm., 2010). The challenge of addressing competing land use with private sector operators is more complex and requires an indirect approach.

4.2 Participatory demarcation: village-level regulations or ecosystem service contracts?

The immediate and obvious response to the issue of core zone encroachment is to demarcate the existing interface between field and forest: the park’s management concedes land already established as coffee plantation in return for agreement from local villagers not to expand illegal cultivation further. BDNB National Park already has some experiences in field-forest boundary demarcation in the buffer zone outside Dachais commune, yet communities were dissatisfied with the incomprehensive process adopted, with only some villages pressed into making agreements of non-agricultural expansion, while other villages were neglected, and so were not asked to make such commitments. A comprehensive participatory demarcation process, targeting all three villages known to encroach on the core zone, superficially appears like a suitable, non-confrontational means of reducing conflict between park and people of the buffer zone.

Similar experiences of village-level charters and regulations¹⁰ on forest protection in Vietnam to date suggest that such ‘processes’ typically constitute a limited number of village meetings between forest protection rangers and local villagers in which, the rangers, top-down, promulgate national regulations on special-use forest management to villagers who unanimously agree to maintaining compliance. A certificate of agreement as signed between heads of households, villages, commune government and forest protection rangers, as part of a ceremony celebrating good will and relations between local government and communities. Clear outputs are achieved (hundreds of household agreements on forest protection, one per household) and both parties, rangers and villagers, can feel some sense of taking action towards joint responsibility for forest protection. The impact of such agreements, like those muted for encroachment demarcation in BDNB, has been demonstrated to be limited (Rastall &

⁹ Vietnamese forest management category comprising national parks and nature reserves; synonymous with ‘terrestrial protected area’.

¹⁰ *Huong uoc* and *quy uoc*, see Swan (2008).

Swan, 2007; Swan, 2008). Once the forest protection agreement signing ceremony is over, villagers continue, more or less, with the same forestland and resource use activities as before. Likewise, forest protection rangers rarely escalate enforcement measures in support of signed agreements. The reason for the failure of forest protection agreements in Vietnam is that they offer no real incentives, or disincentives, for local peoples to modify their actions towards more biodiversity conservation-oriented behaviours.

What is required for the BDNB encroachment situation is an innovative variation on the demarcation-with-agreement approach, one that commits both local government (represented primarily by park management) and communities to adopting real and significant responsibilities towards forest protection in return for real and significant benefits. Disincentives for (enforcement of) agreement infractions also need to be in place to dissuade those individuals who perceive a greater short-term benefit can be achieved through disregard of any commitments made by the community as a whole.

The key to achieving effective agreements on curtailing encroachment in BDNB are the existing PES forest protection contracts, as, unlike the informal agreements limned above, these contracts offer the potential of significant benefits in return for substantial protection responsibilities. Although, previously discounted, as viable collaborative management mechanisms on the grounds of weak, or even non-existent, monitoring and enforcement of contract performance (Swan, 2008), revisiting the forest protection contract model could yield significant incentives to engage local people in day-to-day park functioning. The monitoring and enforcement challenges remain, and still need to be considered; what has changed in BDNB over the past 12 months, is the evolution of forest protection contracts from compensatory mechanisms funded by budget allocation, into PES contracts of significantly (nearly 300 %) greater value. If significantly greater (cash) benefits are now offered, can significantly greater forest protection responsibilities (i.e. unconditional commitment to cease encroachment) not be expected by the national park management board in return?

Currently, the PES contracts are still operating primarily as compensation payments to individual ethnic minority households. To offer effective incentives for proactive community management of core zone forests, together with disincentives for infraction of contractual responsibilities, the forest protection contracts need to be modified from their current form. The key change required is for the park management board to issue contracts to *groups* of, not individual, households. Villagers are already informally managing, and sharing the benefits from, their combined forest protection contracts collectively. These behaviours should be formalized through group contracts conferring 'collective property' rights for common-pool resources. The other major change required is a genuine process of contract *negotiation*. Presently, contracts bearing significant benefits (upwards of USD 500/year and projected to increase), are offered by park management without any negotiation of responsibilities to be adopted in return for this benefit. Rather than pay lip service to a village-level regulation/charter process, consent to cease encroachment within the core zone, together with annual checking and demarcating field-forest boundaries could be negotiated as explicit terms in a revised forest protection contract.

4.3 Payments for Ecosystem Services – an entry point for co-management?

Group forest protection contracts, developed through a participatory process of negotiation, as described here, are, in effect, nascent models of co-management (as defined by a sharing of natural resource management responsibilities between two or more stakeholders through a negotiated process - Borrini-Feyerabend *et al.*, 2004). Groups of households could become formalized beyond the stipulations of the contract under relatively new legislation for agricultural and natural resource co-operatives¹¹. The resultant Community-Based Organizations would constitute empowered co-management institutions partially responsible for delivering ecosystem services of catchment protection and reliable quality water supply, being rewarded at rates that yield greater benefits per unit cost than alternative land use options (i.e. coffee farming). The intuitional challenge lies not at the community level, but with government agencies (forest management boards), in convincing policy and practice should value long-term economic and public service gains of catchment protection over shorter term private gains of other land use options, namely coffee or trout farming and tourism development.

Ultimately, macro-level and sectoral provincial government PPPs need to accommodate the development of sustainable livelihoods of an expanding rural population as well as regional economic development and environmental (including biodiversity) protection. These goals are unobtainable at the site or project level, consequently, pilot models of both sustainable agroforestry-based livelihoods and participatory forest management should be demonstrated for wider adoption and replication by local government. Investments and experiments will be required in both the buffer zone (improved productivity from the same fixed area of agricultural land) to reduce pressures on forestland use; in addition to the core zone (innovative collaborative natural resource management) to place a competitive economic value of intact ecosystem services. There is no reason why buffer and core zone interventions cannot also be linked as co-benefits in revised and renewed forest protection contracting schemes. Failure to address issues, and develop opportunities either side of the core-buffer zone boundary will permit continued encroachment for the foreseeable future.

Summary recommendations

1. **Exploit the opportunity presented by PES forest protection contracts** – avoid the obvious path of least resistance (and, consequently, least effectiveness) in adopting a field-forest boundary demarcation exercise linked to a village-level ‘agreement’ (regulation/charter). Instead incorporate encroachment monitoring and enforcement into revised PES forest protection contracts. Boundary marking should become an integral condition of annual PES contract renewal: joint community and park ranger teams can review boundaries demarcated the year previous and remark/reconfirm boundaries for coming year. Any encroachment detected should be viewed as breach of contract and appropriate penalties, as detailed in the contract, should be administered, including contract severance in severe cases.

¹¹ Following Government Decree No. 151/2007/NĐ-CP, dated 10.10.07, on the Organization and Activities of Collaborative Groups

2. **Simple participatory contract compliance monitoring and enforcement mechanisms** – are essential to elevate the existing service provision contracts to a model of co-management potential. In the absence of effective monitoring, supported by impartial and rigorous enforcement of contract stipulations, improved forest management cannot be unequivocally demonstrated as a direct corollary of these the forest protection contracts; contract payments would effectively remain as ‘handouts’ (Swan, 2008). With significantly greater cash benefits now on offer from FPDF PES contracts; there is adequate justification for demanding improved performance from local community service providers. Although a year of PES contract implementation has already transpired, it may not be too late to modify monitoring measures, building on the existing joint community and ranger patrols, to ensure tighter contractual compliance. In the context of encroachment abatement, monitoring and enforcement of demarcated field-forest boundaries within the core zone will be paramount. A strict enforcement policy, sanctioning relatively minor infractions and incursions into forestland, will be required to avoid incremental erosion of demarcated boundaries.
3. **PES provision contracted to ‘forest protection groups’** – building on existing informal collective management of PES contracts and resultant benefits, to formalize collective responsibility for public services in addition to strengthening collective voice for contract negotiations. Forest protection groups, themselves, could be institutionally formalized through local government approval (following Decree 151) as natural resource (or in this case, service) management co-operatives. Investment in institutional development of such CBOs marks the point of departure from ‘contract’ management, with the park management board outsourcing certain park functions to local households, and into the realms of co-management and associated shared governance of natural resources. Theoretically, a co-management model of collective (among households) and shared (between households and park management board) responsibility will yield stronger commitments, translating to improved performance, from both parties, in terms of forest protection.
4. **Ensure comprehensive and equitable contracting among all households in target villages** – Currently, a few (18) households in the three target villages have yet to sign PES forest protection contracts; contracting of forest protection groups should include all households and strive towards equitable distribution of cost (responsibilities) and benefits. Cost/benefit sharing need not be equally distributed among all participating households, but should be weighted to reflect current asset and aspirations of individual households, e.g. if a household can and wants to take on more (or less) responsibility, a fair and transparent process of negotiation should facilitate apportioning of responsibility (and resultant benefits) accordingly. Efforts should also be made to avoid negotiation dominance and disproportionate benefit capture by local elites (a common weakness of external processes and structures attempting to achieve dual livelihood and conservation outcomes, e.g. Fisher *et al.* 2005).
5. **Monitor developments in the national legislative framework** – at the time of writing, the government of Vietnam is concluding the process of drafting new legislation on SUF organization and management, which could present significant new opportunities for engaging local communities in novel models of co-management and PES. The current draft (19.12.09) defines co-management for the first time in the context of Vietnamese SUFs: ‘...communities,

households, individuals, domestic and foreign, collaborate with the SUF management on the basis of contract, joint-venture or association, to conduct activities of providing forest environmental services and/or other management activities...'. Although this definition is inconsistent with emerging international good practice definitions (e.g. Borrini-Feyerabend *et al.*, 2004), and potentially more supportive of '(sub-) contract management', as is the case of existing PES contracts in BDNB, previously, no statements in Vietnamese forestry sector ordinance supported co-management. The current draft still largely prohibits conservation through sustainable use of non-threatened resources, thus limiting co-management to service-based models. Until a final draft is approved later in 2010; resource-based models of co-management should not be considered or attempted. Tourism remains a viable service-based co-management opportunity, positively supported by this and existing legislation; encroachment demarcation activities could equally form conditional elements of tourism-based co-management along the lines of the catchment management model outlined herein.

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Annex I Semi-structured Interview Outline

Household and key informant interviews only:

- Location (recorded by GPS receiver)
- Age
- Gender
- Ethnicity
- Relative household poverty - poor, medium or rich
- Household (family) size
- Area of allocated agricultural land
- Agricultural land bordering the forest (allocated or otherwise)
- Crops grown
- Hectares of coffee under cultivation

All interview types (household and key informant interviews; focus discussion groups):

- Do you know where the boundary is between the forest- and the agricultural land?
 - o How do you know?
 - o Is it common knowledge?
 - o Is there a marker?
 - o Have you been told by the park rangers? (or another reason)
- What are the general reasons people encroach on the forest?
- Why do you feel you need land from the forest?
- Is there anything that could be done to improve this situation?
- Have you ever encroached on the forest?
 - o If so, what happened?
 - o How much land did you clear?
 - o How did you clear it?
 - o What did you use it for?
 - o Was there any trouble with the park?
- What do you think about the national park authorities and the rangers?
- Do you see any value in protecting the forest?
- What do you think about marking out the boundary between agricultural- and forestland?
- Would you be interested to attend meetings between the park and local people to discuss the issue and find a way forward?