Amani Butterfly Forest-based Enterprise, Tanga, Tanzania

March 2006

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Tom Blomley
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Acronyms

**FBD-MNRT**
Forestry and Beekeeping Division of the Ministry of Natural Resources and Tourism

**TFCG**
Tanzania Forest Conservation Group

**NGO**
Non-Governmental Organization

**VLFR**
Village Land Forest Reserve

**ABE**
Amani Butterfly Enterprise

**ABP**
Amani Butterfly Project, a branch of the Amani Butterfly Enterprise whose staff are based either in Amani or TFCG-Dar es Salaam

**ABP-TA**
TFCG-based Amani Butterfly Project Technical Assistant

**CBE**
Community Based Enterprise
1. Introduction

Tanzania villagers in the vicinity of Amani town who joined the Amani Butterfly enterprise have found that it has opened doors of opportunity they never dreamt of. Typically, these villagers struggle to live on less than a dollar a day, making a living on small cash crops that survive in an environment still dominated by highland rainforest. After enduring a year of mockery from fellow villagers who doubted that they would get paid for their butterflies, the first enterprise members found that they were getting the last laugh. For the first time, butterfly farmers and their families found that they could afford to pay for all their children’s school fees and study materials, build durable brick homes, hire labor to work their agricultural fields and even save a little for the future (ABP Field Assistant, personal communication). Moreover, thanks to the enterprise’s Community Development Fund, they could state with pride that they were actively contributing to the overall welfare of their communities. Today, the number of members has soared from an initial two hundred to three hundred and fifty, and additional villages are joining in with enthusiasm.

By the end of its first year, the butterfly farming and export enterprise in Amani, Tanzania, had demonstrated that it could provide a decent monthly income in exchange for modest amounts of labor and time. At the same time, the activity requires considerable attention to detail and the willingness to learn about an entirely new and rather complex subject: the lifecycle and ecological requirements of wild butterflies. Indeed, perhaps because of the steep learning curve involved, the enterprise tends to attract the younger generation. It is especially popular among women, who find the requirements of butterfly farming compatible with daily household responsibilities. Today, the ratio of male female participation in the enterprise stands at 45 and 55 % respectively.

This case study shares the successes, challenges and lessons learnt of the Amani Butterfly Enterprise, a pro-poor, conservation oriented, forest-based enterprise that has found a niche for itself in a Western market willing to pay well for the opportunity to experience the variety and uniqueness of East African highland forest butterfly species.

Please note that this case study will refer to the enterprise as Amani Butterfly Enterprise, or ABE, unless the sentence is referring to a specific administrative unit within the enterprise, such as the Amani Butterfly Farmers, the Amani Butterfly Group or the Amani Butterfly Project (see Section 4 on enterprise organization for details on each of these units).

2. Country background

Of the estimated 33 million hectares of forested land in Tanzania, 57% (around 19 million hectares) is largely unprotected and outside government forest reserves (URT, 2001). The National Forest Policy explicitly recognizes this and provides incentives for forest management at the lowest level of local government – the village – which number over 10,000 in Tanzania. In the early 1990s a number of pilot PFM activities were started in northern and western Tanzania, which for the first time provided a mechanism for the transfer of forest ownership and management responsibility from central to village government. Following these successful and well- documented pilots, other forest areas were bought under community management or community co-management. Notable examples include the East Usambara forests of Tanga region, highland forests of Iringa as well as lower miombo woodlands, and more recently coastal forests in Tanga, Mtwara and Lindi regions. These pilots, implemented by a range of actors including local and international NGOs, local governments and supported by bilateral donors, collectively demonstrated the viability of PFM under a range of social and ecological conditions. These experiments across the country coincided with a review of the forest policy and legislation in the late 1990s, together with sweeping reforms in Tanzania’s economic and political spheres, and directly contributed to a favorable legal environment for PFM. Currently, mainland Tanzania has one of the most advanced community forestry jurisdictions in Africa as reflected in policy, law and practice (Wily, 2000).

The policy objectives of PFM are illustrated in Box 1 below:
Box 1: PFM policy objectives

- Improved forest quality through sustainable management practices
- Improved livelihood security through secure rights to subsistence and commercially traded forest produce
- Effective and representative village natural resource management institutions

Source: URT, 2003

Two main approaches for implementing PFM are being promoted in Tanzania: Joint Forest Management and Community Based Forest Management.

**Joint Forest Management (JFM)** is a collaborative management approach, which divides forest management responsibility and returns between government (either central or local) and forest adjacent communities. It takes place on land reserved for forest management such as National Forest Reserves (NFRs) (for catchment, mangrove or production purposes) and Local Government Forest Reserves (LGFRs). It is formalized through the signing of a Joint Management Agreement (JMA) between village representatives and government (either the District Council or Ministry of Natural Resources and Tourism).

**Community Based Forest Management (CBFM)** takes place in forests on “village land” (land which has been surveyed and registered under the provisions of the Village Land Act (1999) and managed by the village council). Under CBFM, villagers take full ownership and management responsibility for an area of forest within their jurisdiction and it is “declared” by village and district government as a Village Land Forest Reserve. Following this legal transfer of rights and responsibilities from central to village government, villagers gain the right to harvest timber and forest products, collect and retain forest royalties, undertake patrols (including arresting and fining offenders) and are exempted from local government taxes (known as “cess”) on forest products, regulations regarding “reserved tree” species, and are not obliged to remit any part of their royalties to either central or local government. The underlying policy goal for CBFM is to progressively bring large areas of unprotected woodlands and forests under village management and protection.

An assessment undertaken in 2006 established that PFM was operating in over 1800 villages and on over 3.3 million hectares of forest land as illustrated below in Table 1:

**Table 1. Estimates of adoption of PFM in Tanzania by 2006**

<table>
<thead>
<tr>
<th>Community Based Forest Management (CBFM)</th>
<th>Source of Data: NGOs, area based projects, national survey, Forestry Division records</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest area under CBFM (hectares)</td>
<td>Number of Villages with CBFM</td>
</tr>
<tr>
<td>1,236,000</td>
<td>1,280</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Joint Forest Management (JFM)</th>
<th>Source of Data: NGOs, area based projects, national survey, Forestry Division records</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest area under JFM (hectares)</td>
<td>No. of villages with JFM</td>
</tr>
<tr>
<td>2,106,000</td>
<td>563</td>
</tr>
</tbody>
</table>

With funding from Government of Tanzania, supported by bilateral and multilateral donors, the Forestry and Beekeeping Division (FBD) of the Ministry of Natural Resources and Tourism is developing a national program for the implementation of participatory forest management. Working primarily through district and village governments, but increasingly supported by NGOs and the private sector, the program has targeted 50 districts across mainland Tanzania (out of a total of 106).
While the adoption of different models of PFM appears to be accelerating across the country and while indications are that forest quality appears to be stabilizing or improving under these local management regimes, the impact of PFM on local livelihoods appears to be less clear. The reasons for this appear to be varied (Blomley and Ramadhani, 2005) – but in many cases are due to restrictions placed on consumptive utilization of forest resources due to factors such as biodiversity or water catchment functions. In such cases, a more creative approach is required to generate local benefits and improving livelihoods.

The East Usambara Mountains are located in Tanga region, north eastern Tanzania and are globally recognized for their exceptional biodiversity importance. The mountain forests contain at least 7 strict endemic vertebrates and a further 28 species that are confined to the Eastern Arc or East Usambara lowland forests. There are also 40 Eastern Arc endemic trees. Most of the remaining forest is contained within 11 National Forest Reserves and one Nature Reserve, and cover approximately 21,000 hectares. Outside Forest Reserves administered by central government, most of the forest has been cleared for farmland, apart from in the Derema proposed Forest Reserve and some other areas proposed as Village Land Forest Reserves.

In the 1970s and 80s the forests were heavily logged by international forestry companies, but an international outcry resulted in the forests being protected and all harvesting operations ceased. Currently, the forests are recognized as having important biodiversity and water catchment functions and are categorized as Protection Forests under administration of the Forestry and Beekeeping Division of central government. Nature Reserve status (currently the highest protection status for Tanzanian forests) has been accorded to Amani Nature Reserve and is the one and only in existence in Tanzania.

In addition to the increased protection efforts over the last two decades, a number of local and international initiatives have sought to involve local communities more directly in local management. Joint Forest Management agreements have been developed, in many of the East Usambara forests, with forest-adjacent communities and the establishment of a number of Village Land Forest Reserves have been facilitated by local and international NGOs. Given the high protection status of many of the National Forest Reserves, local use options are rather limited for the surrounding communities - although the gathering of limited non-timber forest products has been permitted on a controlled basis - such as medicinal plants, honey and more recently collection of butterflies for farming.

The case study presented below refers to an enterprise based around informal access agreements with National Forest Reserves, private forests and Village Land Forest Reserves.

3. Overview of the country case study

**Enterprise location and livelihood context**

_Mradi wa Vipepeo, Amani or Amani Butterfly Project_, henceforth referred to as _Amani Butterfly Enterprise_, is located in the Amani town area, Muheza District, Tanga Region. This area is in the Southern part of the East Usambara Mountains, whose high elevation forests have recently been designated as a UNESCO Biosphere Reserve. In turn, these mountains form part of the Eastern Arc Mountains.

Villagers in the Amani town area secure most of their income through cash crops including cardamom, cinnamon, cloves, coffee, tea and bananas, or by selling cow's milk to a nearby dairy company. These activities consume most of their productive time. Butterfly farming is a trouble-free addition to these activities because it allows producers to work from home and has limited and flexible labor time requirements. Indeed, it blends in especially well with women's daily timetables. With regard to household socio-economic differentiation, cattle ownership is the biggest indicator of higher household income in the Amani area, followed by land ownership (Morgan-Brown, T. and A. Saidi, 2005). There is little to no significant income from seasonal or temporary labor migration or off-farm labor.
**Forest tenure arrangements**

Enterprise members belong to four villages in the vicinity of Amani. Each borders various tracts of forest representing a range of legal ownership categories. The largest tract of protected forest is the 8,380ha Amani Nature Reserve. In addition, there are three Forest Reserves, Longuza, Kambai and Derema, the latter still in proposal stage. All these reserves are managed directly by the Forestry and Beekeeping Division of the Ministry of Natural Resources and Tourism (FBD-MNRT). However, the Reserves have differing management regimes. Amani Nature Reserve has the greatest access restrictions and is managed by a Board of Trustees and a Conservator. It has certain autonomy from the Ministry as it is permitted to seek independent funding through a Conservation Fund. Kambai and Derema Forest Reserves are also managed by a semi-autonomous entity within FBD known as the East Usambara Conservation Area Management Program (EUCAMP). Until recently this program was funded by the Bilateral Aid program of Finland, but increasingly the funding is coming from internal sources within FBD. Longuza Forest Reserve, a significant proportion of which is a Teak plantation, is under direct FBD-MNRT control. In addition to the government Reserves, some villages border with privately owned tea estate forests and all project villages have small to medium adjacent village forests, two of which have been declared and one legally established as Village Land Forest Reserves (VLFR) with assistance from the Amani Nature Reserve and a National NGO, the Tanzanian Forest Conservation Group or TFCG (Table 2).
Table 2. Type of forest, tenure and access agreements for forests adjacent to Amani Butterfly Enterprise participating villages

<table>
<thead>
<tr>
<th>Village/Area</th>
<th>Village Forest</th>
<th>Nearby Forest Reserves</th>
<th>Nearby Private Forest</th>
<th>Access agreements between Amani Butterfly Enterprise and the forests</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Kwezitu</strong></td>
<td>Sizeable Village Land Forest Reserve (VLFR) declared in 2000 and managed with help from TFCG. Legally established.</td>
<td>The Kambai and Derema Forest Reserves. Derema FR is still being proposed, while Kambai FR is legally established.</td>
<td>Permitted to capture butterflies and collect seeds from the Forest Reserves. Forest access agreements are verbal/informal.</td>
<td></td>
</tr>
<tr>
<td><strong>Msasa IBC</strong></td>
<td>Small Village Forest. Has not been proposed as a reserve or attained any form of legal status.</td>
<td>The Derema Forest Reserve, legally established.</td>
<td>Permitted to capture butterflies and collect seeds from the Forest Reserve and tea estate forests. Access agreements are verbal/informal.</td>
<td></td>
</tr>
<tr>
<td><strong>Shambangeda</strong></td>
<td>Large VLFR declared in 2003 and managed with help from Amani Nature Reserve and TFCG. Still waiting for District Council approval.</td>
<td>Large buffer forest patches owned by tea estates, but managed by Amani Nature Reserve.</td>
<td>Permitted to capture butterflies and collect seeds from the tea estate forests. Access agreements are verbal/informal.</td>
<td></td>
</tr>
<tr>
<td><strong>Kisiwani</strong></td>
<td>Very small Village Forest. Unlikely to obtain legal status.</td>
<td>The Longuza Forest Reserve, legally established.</td>
<td>Permitted to capture butterflies and collect seeds from the Forest Reserve and tea estate forests. Access agreements are verbal/informal.</td>
<td></td>
</tr>
<tr>
<td><strong>Villages in training: Mbomore and Shebomeza</strong></td>
<td>Amani Nature Reserve. This Nature Reserve was legally established in 1997. It is a Central Government reserve with a higher category of access restriction than a National Forest Reserve, the details of which only become clear by looking at management plans.</td>
<td>Not permitted to access Amani Nature Reserve for butterfly capture or host plant foraging. There are formal MOUs between the Nature Reserve and all eighteen buffer zone villages.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Institutional and financing arrangements

Box 2: Sources of funding for the Amani Butterfly Project

- 2001-2002: The US Fulbright Fellowship Program (Feasibility Study) - $25,000
- 2002-2003: The Diplomatic Spouses Group, Tanzania (Motorcycle, Live Butterfly Exhibit, Farming Equipment) - $3600
- 2003: The African Rainforest Conservancy (Project Running Costs) - $4000
- 2003: Irish Aid via the District of Muheza (Project Marketing and Education Center Building) - $5000
- 2003 – 2004: UNDP/GEF Small Grants Program (technical assistance and working capital) - $29,000
- 2005- 2007 McKnight Foundation $75,000,
- 2006-2007 CEPF (Critical Ecosystems Partnership Fund) $9,980

(Adapted from a table in TFCG’s 2003 Amani Butterfly Project generic project proposal)

The enterprise benefits from the support of the Tanzania Forest Conservation Group, or TFCG, an NGO that has assisted the enterprise both financially and administratively with the help of funding from various donors (Box 2). TFCG’s mission is to promote the conservation of high biodiversity forests in Tanzania and to support sustainable livelihoods among adjacent communities.

TFCG has been working in the East Usambaras since 1993 on what is now called the East Usambaras Forest Landscape Restoration Project. The project aims are fourfold: to restore forest connectivity (through a range of activities including agro-forestry and PFM implementation), to integrate broader decision-making processes, to carry out environmental education, and to improve local livelihoods. With the exception of the Amani Butterfly Enterprise, all TFCGs’ livelihood projects in the East Usambaras are either slated as small-scale household-level operations or have only recently considered expansion.

Though financially and administratively independent from TFCG’s other activities in the area, ABE is linked into the broader framework of the NGO’s forest conservation goals and accomplishments. Thus, the villages chosen to participate in the enterprise and the decision to create a CBE in the first place, are largely the result of the NGO’s progress in instituting PFM. For example, Kwezitu and Shebomeza were selected as ABE member villages because the TFCG had already begun the process of establishing VLFRs in both locations.

Table 3. Summary statistics for Amani Butterfly Enterprise, 2005

<table>
<thead>
<tr>
<th>Number of participating villages</th>
<th>Number of members (butterfly farmers)</th>
<th>Percentage of women members</th>
<th>Number of management staff</th>
<th>Allocation of sales income</th>
<th>2004 sales income (US$)</th>
<th>Increase in sales from 2004 (US$)</th>
<th>Average income per farmer (US$)</th>
<th>Supporting institution and donor(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>350</td>
<td>55</td>
<td>6</td>
<td>28% for running costs and salaries 65% for producers 7% for a Community Development Fund</td>
<td>44,968.6</td>
<td>25,498.2</td>
<td>90.45</td>
<td>Tanzania Forest Conservation Group; McKnight Foundation and Critical Ecosystems Partnership Fund</td>
</tr>
</tbody>
</table>
**History and activities**

ABE is a young but promising endeavor still building up to its self-management and income-generating potential. Member producers, or butterfly farmers, raise local butterfly larvae to sell to European and North American live butterfly exhibits or ‘butterfly houses’. The butterflies are sold in their chrysalis (pupa) phase, and emerge as adult butterflies upon arrival to a butterfly house. The butterfly house then charges tourists admission to see tropical butterflies from all over the world.

Amani Butterfly Enterprise has its roots in a ten-month, Fulbright-US-sponsored feasibility study carried out in 2001 by Theron Morgan-Brown, a biologist affiliated with TFCG. In addition to the feasibility study, TFCG and Mr. Morgan-Brown relied on a small amount of start-up funds obtained from various donors (Box 2), and on mentoring and training by the well-established Kipepeo Butterfly Project in Kenya, to get started. By November 2003 the enterprise had secured local support from district and national-level authorities (Box 5), obtained the necessary legal permits, commenced production and was ready to export. The first butterfly export took place in Dec 2003. Thus, ABE has been up and running for slightly over two years. In this relatively short amount of time, it has secured 350 active member producers and reached US$ 45,000 in annual sales (Table 3).

**Administrative structure, stated goals and effectiveness**

The enterprise administrative structure consists of a three-way partnership between i) the donor-funded, NGO-based Amani Butterfly Project (ABP) ii) the Amani-based Amani Butterfly Group (ABG) led by a farmer-elected Executive Committee and iii) the sub-village Butterfly Farmers’ Groups. The stated goals of ABE are as follows:

- To improve the livelihoods of women and men in remote rural communities
- To create a sustainable butterfly cooperative as a model for future projects in Africa
- To promote the conservation of a biodiversity “hotspot”

There appears to be a good fit between stated enterprise goals and on the ground activities. By end 2005 the enterprise is considered financially but not yet managerially self-sufficient; it is raising household incomes; offering employment for the under employed and contributing to community development. Similarly, ABE is administratively effective, partly due to an adaptive management strategy that has enabled it to cope well with contingencies as they arise.

**Market**

Amani Butterfly Enterprise has created for itself a select and potentially profitable niche within the global butterfly market. Moreover, the enterprise controls all stages of the value-chain, from producers to buyers. The latter are the live butterfly exhibitors themselves. Thus, there is no reliance on intermediaries.

4. Enterprise organization, management and governance

**A three-way administrative partnership**

The fact that ABE is in its formative stages is reflected in its organizational structure, which relies on a three-way partnership between i) a supporting national Non-Governmental Organization, the Tanzania Forest Conservation Group (TFCG) ii) the Amani Butterfly Group and iii) the Butterfly Farmers’ Groups (Box 3). TFCG set up the three arms of the partnership when it came in as a major enterprise supporter in 2002. The Amani Butterfly Project is internal to TFCG, while the other two are independent and based in Amani. At present, the enterprise receives technical, institutional and financial support from the first listed partner, which goes under the name of the TFCG Amani Butterfly Project. TFCG uses a small percentage of the donor funds to run its project, but obtains no profit from enterprise sales. Despite the partners’ dependence on TFCG’s support, all three have been actively working towards achieving financial and technical independence for the Amani Butterfly Enterprise. For example, most decision-making is
shared, responsibilities are slowly moving downwards, and transfer of skills training has been ongoing (TFCG 2005b; see Section 6 for professional training details). In addition, consistent efforts at increasing sales and productivity have led to steady increases in gross earnings. Indeed, as of 2005, the enterprise earns enough income to sustain itself (ABP-TA, personal communication).

Box 3: Administrative arrangements for Amani Butterfly Enterprise

i) TFCG’s Amani Butterfly Project
TFCG set up the Amani Butterfly Project in 2002 as part of their Livelihoods Program. Their long term goal is to facilitate the formation of a self sustaining butterfly farming cooperative enterprise in the East Usambara Mountains, which in turn is to serve as a model for other forest-based butterfly farming enterprises. It is administered by TFCG’s Executive Committee, a Project Officer (who is also TFCG’s Executive Officer), a Technical Assistant, a Shipper (responsible for shipping packages overseas) and six staff members located in Amani. The latter consist of a Project Manager, a Community Liaison Officer, a Field Assistant, two office guards and an office cleaner. The Liaison Officer is a new appointee and the first woman to join the management staff. All TFCG-based staff, the Liaison Officer and Project Manager have higher degrees; the Shipper and Field Assistant are high school graduates.

Amani Butterfly Project’s overall responsibilities include:

- Implementation activities. It seeks funding for investment and working capital, purchases equipment, and provides startup training to new farmers
- Accounts management. The project manages all ABE funds, including donor funds and annual income from sales. 28% of sales are used for enterprise running costs, 7% for a Community Development Fund, and 65% is returned to farmers, who are paid up-front according to each individual farmer’s output
- Management and marketing support. The project provides managerial, accounting and marketing support to the Amani Butterfly Group. For example, the project purchases all butterflies from the Amani Butterfly Group, then markets and sells them at a higher price
- Hiring and firing all Amani Butterfly Project management staff
• Professional training. The project has, and continues to facilitate, professional training for its own hired staff, for Amani Butterfly Group members and for butterfly farmers. Training has focused on a variety of subjects ranging from butterfly biology to organizational skills, accounting, use of computer software, marketing and communications.

• Monitoring activities. These include monitoring the enterprise’s impacts on wild butterfly and host plant populations as well as household socio-economic status.

• Ultimately, transferring all funds, equipment and decision-making responsibilities to the Amani Butterfly Group. An initial deadline for handing over all financial and decision-making responsibilities from TFCG to the Amani Butterfly Group was set in 2002 as February 1st, 2006 (TFCG 2002). However, this deadline has been extended, for reasons outlined below.

In addition, it is worth distinguishing between staffs whose salaries are paid for by donor funds, and staffs whose salaries are covered by income from butterfly sales. While of the former are all based in TFCG-Dar es Salaam, the latter are Amani-based, with the exception of the Shipper who operates out of Dar es Salaam. This grouping of staff budget lines and location may well indicate the dividing line between the TFCG-branch, which will sooner or later de-link from the enterprise, and what may then become ABE staff proper, hired by the Amani Butterfly Group Executive Committee.

ii) The Amani Butterfly Group

The Amani Butterfly Group was also created in 2002. It consists of an Executive Committee comprised of three elected representatives - at least one of which must be a woman - from each village involved in butterfly farming. The Executive Committee elects a chairperson annually.

The Group’s responsibilities are to:

• Represent the butterfly farming groups from each sub-village involved in the project
• Hold bi-monthly meetings
• Make pricing decisions
• Charge an annual 2,000TSh/US$ 1.70 licensing fee. This fee is collected from each member farmer. Since mid 2004, this system replaced a previous one - whereby fees were collected on a group basis at 15,000TSh/US$ 12.70 per group - to prevent certain farmers from shirking their financial responsibilities. This fee covers the administrative costs of the group, including Executive Committee meeting meals and sitting fees (the latter involve paying TSh3,000/US$ 2.50 per person), and for the annual renewal of farmer ID cards and of the Trophy Dealers’ License (TSh10,000/US$ 8.50 per year), which serves as a collective business license for all ABE member farmers.
• Supervise the collection and sale of butterflies by farmers to the TFCG Amani Butterfly Project on a bi-weekly basis
• Supervise farmers’ receipt of payments for their products on a monthly basis
• Manage a Community Development Fund. 7% of project’s yearly earnings are used to create a community development fund for villages involved in the project (about US$ 3150 in the first year). At the moment the Fund account is held by TFCG. Villages selling more pupae get a greater share of the fund, calculated on an annual basis. There are specifications for the use of these funds. Thus, village proposals must be approved by the farmer-elected Executive Committee and can only be used to finance physical infrastructure or professional skilled work. An appointed member of the Butterfly Farmers’ Groups in that village accompanies the village committee to withdraw and spend funds, and his transport, accommodation and food costs must be covered by the village (see Section 6 for details on the Fund’s activities).

Note that TSh figures prior to 2005 have been converted to dollars using an exchange rate of 1040 TSh to the dollar, while TSh figures post and including 2005 have been converted using an exchange rate of 1180.
iii) The sub-village Butterfly Farming Groups
At present, there are four participating villages, with an additional two in training and scheduled to begin production in May 2006. This is projected to boost the number of members from 350 to some 400. During the Enterprise’s first year, butterfly farmers were organized in production groups of 10-20, each with a constitution, and an annually elected chairperson, treasurer and secretary. However, while the groups remain, as from mid 2005 the great majority no longer operates as a productive unit and, if it does, the producer group is no larger than 2-3 farmers (see below for more details on this issue). Responsibilities among the farmers have been divided as follows:

Individual farmer responsibilities:
- Carry out all productive activities required for butterfly farming at their own private financial and labor-time expense. These include equipment purchase and implementation, production, maintenance and repairs. If working in twos or threes, any additional arrangements are internal to the sub-group

Farmer Group responsibilities:
- Elect an annual chairman, treasurer and secretary
- Collect farmers’ pupae on a bi-weekly basis, account for species number and type, producer and date, and hand these over to ABP management staff
- Send one representative to the ABP office to collect payments on a monthly basis
- Inform all group members of pricing or policy changes made by the Executive Committee, and of any training opportunities
- Communicate needs and ideas to the Amani Butterfly Group Executive Committee

Discussion

Managerial self-sufficiency
The main governance issue facing ABE is that of administrative self-sufficiency. The deadline of February 2006 for TFCG to hand over the project has come and gone, and the devolvement has been deferred. While ABE has achieved financial self-sufficiency in terms of its recurrent costs, the NGO believes that the Group is not technically or managerially prepared for independence. In their view, it may take another five years to achieve this, either through ongoing training, or by earning enough profits to be able to hire capable outside assistance (ABP Program Officer, personal communication). Moreover, marketing activities could be relegated to an external private sector entity that would act as an intermediary between producers and buyers. However, this last arrangement is less than ideal, as it would imply the loss of a profitable link in the product value chain. Consequently, TFCG believes that the better option is for the Butterfly Group to hire capable individuals who would be directly accountable to the Group. To secure that accountability, the ABG committee could include a representative from TFCG at least during the initial phases of independence (TFCG Chief Technical Advisor, personal communication).

At present, the transfer of Amani-based staff – and the Shipper – from TFCG to the Amani Butterfly Group appears to be a viable proposition. Indeed, the Amani-based Project Manager expressed confidence in his and his staff’s ability to manage all aspects of the enterprise. He believes they could work independently of TFCG, provided they obtain some guidance from the NGO in financial accountability and transparency, and provided that the NGO remained available to answer additional queries. The Manager’s confidence notwithstanding, the issue of financial and managerial accountability is no small hurdle to overcome. Moreover, Amani-based staff does not yet possess three key skills:

i) the ability to communicate effectively with, and to attract, new buyers
ii) a thorough understanding of budget planning and management

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3 The 2005 Amani Butterfly Project Annual Report shows that, during the July-September period, the Project Manager negotiated just 20% of sales without help from the TFCG Technical Assistant.
iii) sufficiently broad technical knowledge to resolve common computer software and hardware problems

In summary, even if TFCG and the Amani Butterfly Group agreed to transfer responsibility for Amani-based enterprise staff to the independent Amani Butterfly Enterprise itself, key skills would still be lacking. Perhaps the most critical if these are effective budget management, budget transparency and managerial accountability.

**Raising productivity through effective governance**

The enterprise’s significant increases in productivity between the first and second year of operations have been largely the result of noteworthy governance-related ‘lessons learnt’. The leading lesson was that butterfly production by farmer groups was not feasible. Despite some advantages inherent in group production – such as lower capital investment and maintenance costs, and reduced labor-time – it became clear that farmers’ individual productivity was seriously impaired by this arrangement. The reasons were two-fold. First, group failure was linked to differences in motivation and work ethics between individual farmers within a group but, rather than report or punish the free-rider(s), farmers preferred to drop their own production or abandon the project. Secondly, group failure resulted from the mistreatment of approximately ten illiterate women members of a group by their male leader. In essence, the man produced less than the women but gave himself the greater share of the profits. Again, rather than report the perpetrator, these women preferred to vote with their feet by lowering production or abandoning the activity altogether. Though project staff knew there was a problem, its exact nature was not brought to light until the new female staff member came on board, and provided a safe platform for women farmers to voice their concerns. In both the above cases, there appeared to be no mechanism internal to the group that ensured individual accountability. Thus, withdrawal became the only viable response.

These problematic group dynamics were solved by a mandate allowing all farmers to produce on an individual basis. However, because managing individual accounts would have been an administrative nightmare, it was agreed that farmers would continue to be paid on a group basis, and the group would then distribute payments according to each members’ production for that month. To minimize dishonest dealings, each group was required to enter every farmer’s output in a group logbook that was signed by the farmer and counter-signed by ABP staff every time pupae were collected (bi-weekly)\(^4\). Regardless of these changes, the group of illiterate women who could not rely on their male counterpart continues to be paid on an individual basis. According to ABP staff, not only have these modifications had a significant positive impact on productivity, there have also been no subsequent cases of dishonest accounting. An additional dynamic contributing towards fair transactions is price transparency, ensured via the distribution and regular update of pricing sheets among all farmers’ groups. Nonetheless, ABP staff admits that the hidden potential for exploitative power relations associated with gender and illiteracy remains.

The Amani Butterfly Group Executive Committee has also contributed to smoother operations by resolving certain conflicts. This Committee has dealt mostly with internal conflicts between village government and butterfly farmers, the majority of which were personally motivated and involved attempts by the former to forbid the latter from carrying out their business. Having no grounds on which to make these prohibitions, the village government charges were dropped (ABP-TA, personal communication). The Executive Committee’s main limitation has been its inability to resolve women’s grievances. This, despite it having a good proportion of women represented.

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\(^4\) In addition to the hard-copy, staff members input information into a hand held computer (palm pilot). The palm pilot data is then incorporated into a central database by the project Manager. This system has considerably reduced both accounting errors and the time spent in transferring data from source to destination.
5. Economics of the enterprise

Though financially afloat, the Amani Butterfly Enterprise is still in the process of building up the income necessary to secure its long-term sustainability. If it succeeds in fulfilling its economic potential, the enterprise will have succeeded on two major fronts. On the one hand, ABE will have obtained enough working capital to pay for all running costs, make up-front payments to farmers, cover long-term equipment depreciation, and to finance any additional training costs. On the other hand, the enterprise will have effectively spearheaded a brand new and profitable Tanzanian export industry owned by the producers and solely reliant on local resources.

At present, the future looks bright. In its first two years, ABE has already proved that it can raise productivity and sales to such a degree as to create an atmosphere of contagious motivation and excitement among both butterfly farmers and management staff. One of the reasons for this fairly rapid establishment and growth is the low initial infrastructural investment required, the costs of which were covered by TFCG-administered donor funds. Another reason is TFCG’s commendable technical involvement. Thus, the NGO assured itself high levels of commitment among enterprise members through effective professional training, inclusive administrative arrangements and favorable financial terms for producers. In particular, ABE’s system of percentage-based earnings (see Section 4) means that increased sales translate directly into increased working capital and incomes for farmers and their communities. In addition, the fact that the enterprise controls all stages of the value chain means that ABE benefits from the final sale price of butterfly pupae.

Startup costs

Startup costs for butterfly production are minimal. In the ABE case, these were covered by donor funds supplied by TFCG through their Amani Butterfly Project (Box 4).

Expanding the enterprise

Approximately fifty interested farmers in two additional villages are currently receiving training in butterfly farming and accounting skills. They are expected to begin production by May 2006. According to the Project Manager, there is also a need to invest in mounting the productivity of already-participating farmers. Funds could cover, for example, loans for improved equipment, materials for host plant nurseries, and/or equipment for small-scale irrigation schemes, without which productivity risks stagnating (see section below on seasonal weather patterns and their effect on productivity for more details).

Working capital

The 28% overhead from sales is used to pay for running costs and should eventually finance all working capital. Current costs covered include motorcycle fuel and repairs, salaries of all Amani-based staff (but also including the Shipper), office and internet bills, and butterfly farming equipment, the latter which is bulk-purchased and later re-sold to producers in installments. At present, however, this budget line is minimally supplemented by donor funding to ensure that there is sufficient working capital in the account for up-front payments to producers. This is because productivity is still rising annually, while the balance of income and expenditures is breaking even. Fortunately, the relationship between increased running costs and increased sales is not linear, and expected to taper off by 2007. At that point, the enterprise will be in the position to finance its own working capital, which should include enough to cover all current costs, as well as long-term equipment and vehicle depreciation and all up-front payments to farmers, taking annual projected growth into account (ABP-TA, personal communication). Eventually, there should even be enough capital to cover environmental education and monitoring activities.
Box 4: Equipment and resources required to setup the Amani Butterfly Enterprise

- Wild butterflies caught during the first year of the project to establish captive populations. These are readily available, e.g. in farmers’ fields and roadsides, provided that these are in the vicinity of the forest.
- Host plants for the Breeding Cage. These consist of seedlings, cuttings or seeds taken from forests and planted in breeding cages for feeding developing larvae. The vast majority of host plants are forest-edge plants. These are readily available in disturbed forest patches, community forests and forest reserve buffer zones that constitute low-priority forest areas not subjected to high levels of restriction. Moreover, a number of butterfly larvae feed on commercial citrus and other species that can be purchased.
- Breeding Cages. The least expensive version of these is made with two suspended mosquito nets sewn together with the appropriate host plants planted inside. More durable cages are made with other netting material (e.g. agricultural netting).
- Sweep nets. These are constructed using heavy wire and extra netting from the breeding cage.
- Traps. These are constructed using light wire and extra netting from the breeding cage.
- Rear Cages. Cloth pouches or small cages that will hold the developing larvae and leaves. These need to be protected from predators, usually done by raising the cages/pouches above the ground and placing any standing poles in plastic containers with water.
- Identity cards for farmers. These should be renewed annually.
- Time. Time to catch pregnant females and maintain the breeding cage. Time required to collect the eggs and feed developing larvae.
- Training butterfly producers. This includes teaching farmers to farm butterflies, to identify different butterfly species during all life-cycle stages and to manage accounts, as well as provision of training materials (e.g. laminated butterfly farming guides). Ideally it should also include training in entrepreneurship and organizational skills.

All additional expenses such as professional training and expansion-related costs are considered ‘one-off’ investments to be covered by TFCG-managed donor funds. One problem with this distinction is that it ignores the fact that the need for professional training and skills-transfering activities are unlikely to disappear in the mid-term. Under such circumstances, some investment costs may need to be re-categorized as running costs.

**Income potential**

There are two types of markets, dried specimen dealers and live butterfly exhibits. The latter represent by far the more promising market. Exhibits are set up in Western countries for tourism or educational purposes, and are often run by local governments and private zoos. Live exhibits need shipments every 2 to 3 weeks, because the life span of most butterflies does not exceed this time period. The standard supply packet in the business is between 250 and 300 butterflies. The average price paid per pupaein the European and American market is between $1.50 and $1.75 with a range from $1.00 (for small common species) to $3.00 (for the endemic Hypolimnas antevorta). Thus, if only ten interested buyers buy butterflies in a year the project already has the market demand to sell between $45,000 USD and $84,000 USD worth of butterflies (TFCG, 2003). Finally, dried specimen dealers buy dried specimens and then resell them to collectors. This market has not yet been developed by the enterprise.

**Actual income generated**

The enterprise received about US$ 45,000 in revenue from butterfly sales for the year 2005. This is up from US$ 20,000 in 2004 (Table 4). The increase is largely due to raises in productivity, since the demand was already there. In future, ABE hopes to obtain incomes as high as US$ $100,000 per year (ABP-TA personal communication). During periods of high production, individual farmers can earn up to TSh 70,000/ US$67 per month.
Table 4. Income and sales for Amani Butterfly Enterprise Jan-Dec 2004, 2005

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Sales US$</td>
<td>19,470.60</td>
<td>44,968.62</td>
</tr>
<tr>
<td>Total Income to Farmers TSh/US$</td>
<td>US$ 16,718.00</td>
<td>TSh 32,926,705.00/US$ 31,660.30</td>
</tr>
<tr>
<td>Average income per farmer TSh/US$</td>
<td>US$ 62.00 (N=270)</td>
<td>TSh 94,076.3/ US$ 90.45 (N=350)</td>
</tr>
<tr>
<td>Estimated market demand US$</td>
<td>40,000.00</td>
<td>50,000.00</td>
</tr>
<tr>
<td>No of buyers</td>
<td>13</td>
<td>16</td>
</tr>
<tr>
<td>No of butterfly species sold</td>
<td>--</td>
<td>27</td>
</tr>
</tbody>
</table>

Source: TFCG 2005b Amani Butterfly Project annual report (Jan-Dec 05); TFCG 2004 McKnight Foundation Proposal and TFCG 2005a Final report for the UNDP/GEF Small Grants Program.

Vertical integration

At present the enterprise is vertically integrated. All aspects of the value chain are either under the control of Amani Butterfly Group or its TFCG-arm, the Amani Butterfly Project. Fortunately, vertical control is economically possible thanks in large part to the wide variety of species available. Thus, there are some 60 marketable species in the Amani area, of which only 27 have been marketed so far. This variety allows the enterprise to sell directly to live exhibits in Europe, the UK and the US, eliminating the need to rely on bulk suppliers. In sum, as long as ABE can secure for itself the upper-level managerial skills it requires, vertical integration is likely to continue after TFCG’s departure.

Markets and marketing

Amani Butterfly Enterprise has created a select and potentially profitable niche within the global butterfly market. The reasons are three fold. First, the market for African butterflies is far from saturated (Slone et al., 1997). Indeed, farmers from Central and Latin America are the most common suppliers of butterfly exhibits in Europe and the US. Second, due to the ecology of the East Usambaras the set of commercially viable species available does not face competition from other existent East African producers. For example, it does not share the same species repertoire as the coastal forest-based Kenyan Kipepeo Butterfly Project on which it modeled itself. Third, the enterprise can benefit from good market timing. The seasonality of Amani butterflies (highest productivity from March onwards) corresponds to the predominant butterfly exhibit season in Western countries. Finally, as mentioned above, the product variety available removes the need for wholesale butterfly buyers and distributors.

Its inherent advantages notwithstanding, ABE is experimenting with marketing strategies in the hopes of attracting buyers. Thus, the ABP-TA is looking for southern hemisphere buyers to compensate for the decrease in demand during the northern hemisphere winter. In addition, farmers offered a 20% discount on certain butterfly species during the peak period of sales in 2005, resulting in an additional buyer, which in turn promises to raise sales to up to US$ 70,000 by 2007 (TFCG, 2005b).

5 Many exhibits close during the northern hemisphere winter because the number of tourists goes down and it is expensive to heat the exhibits.
Risk of market decline

There is no foreseeable risk of market decline. The live exhibit industry has been growing steadily since the 1970’s (TFCG, 2003). Moreover, while in-house exhibit breeding of some species may occur where climates are favorable (e.g. Florida), this is rare and unlikely to affect the market demand for butterflies from the Amani Butterfly Project. Indeed, the vast majority of tropical butterflies are far easier and less costly to produce in their natural environment, where ecological requirements can be met. Regardless, to ensure future sales, it has been agreed that butterfly pupae from Amani will only be sold to live butterfly exhibits that agree not to create their own captive populations (TFCG, 2004).

Transport and communication

Pupae export packages are highly time sensitive and must be shipped as soon as possible after collection. This is because pupae can hatch within a week to twelve days. As a result, having access to appropriate transport and communication services is imperative for enterprise success. The Amani-based project office now has satellite dish Internet capabilities as well as a phone service and two motorcycles. There is also a daily bus service which reaches Muheza, Tanga and Dar es Salaam. Project staffs send pupae packages on the early morning bus to Dar es Salaam twice a week, the day after collection. The Shipper receives the packages at around mid-day and sends them overseas that afternoon, through DHL. A significant transporting challenge is associated with package delays and losses by DHL, which buyers do not expect to pay for. Delays and mis-sent packages are responsible for a loss of approximately 15% in annual sales, which is standard for the industry (TFCG, 2004).

Another transport-related challenge pertains to security. To date, Amani staff members had been relying on the ABP - TA’s truck to safely collect farmers’ monthly cash payments from Tanga. Now that the TA has shifted locations and the truck is unavailable, the manager must risk his own life, his motorbike and the farmers’ money at the end of every month. This is a growing concern as crime in the region is on the rise, partly due to the recent discovery of gold in the mountains surrounding Amani, which has drawn in itinerant, often-unruly groups of small-scale miners with no ties to the locals.

Productivity

One of the main lessons learnt by management, as we saw above, is that productivity rises when farmers produce and earn as individuals. However, there are other factors affecting output. One is the seasonal weather pattern in Amani, and another is the effect of individual farmers’ skills and accumulated experience on butterfly production.

Annual changes in temperature and humidity affect butterfly production. However, the range of altitudes of the four participating villages - 300 to1000m - tends to balance out the variation such that there are always some butterfly pupae available, though not always enough (TFCG, 2004 and ABP Manager). The most significant decline in production occurs during the hot season (Dec-March). Humidity and available water in low elevation villages such as Msasa IBC and Kisiwani decrease to the point where egg-laying frequencies and availability of host plants are reduced, and larvae die. In particularly dry years, farmers abandon butterfly farming and turn to alternative sources of income such as selling cloves. Nonetheless, these villages tend to compensate for their low productivity during the hot season by producing more than the high elevation villages during the cold months of June, July and August (ABP Manager, personal communication).

Although cold weather is difficult to mitigate in a village context, some dry season effects can be warded off through simple irrigation methods. Possibilities include setting up a portable tree seedling nursery representing a variety of host plants and transporting plants to and fro between available water sources and butterfly/larvae cages, and raising the humidity of breeding cages through periodical wetting (e.g.
showering the cage with a hand held spray pump or simply pouring water onto the ground). However, these methods have not yet been widely adopted and/or tested.

Discussion

Amani Butterfly Enterprise has tremendous economic potential. In just two years, it has increased sales to the point of financially self-sufficiency. The steady upward trend in sales has been a great business motivator, particularly since producers and managers stand to gain directly from increased sales. Moreover, the special niche the enterprise occupies in an already growing market proffers mid-to-long term economic security.

At the same time, there are a few areas that need attention. The first requirement is that of securing sufficient working capital to fund all running and depreciation costs, including up-front payments to farmers under conditions of expansion, and ongoing training needs. The second pending issue is that of addressing the investment needs of current enterprise members to ensure that growth and development takes place as anticipated. If redress able causes of low productivity are not mitigated, the result may be output stagnation in the mid- to long term. The third requisite is that of decreasing the security risk faced by ABE staff members transporting large sums of cash on a regular basis.

6. Environmental and social benefits and impact on biodiversity

ABE has invested a considerable amount of energy and time into maximizing its positive impact on local forest conservation and on vulnerable social groups, in large part due to TFCG’s dual commitment to forests and their communities.

Conservation impact and benefits

First, the enterprise provides farmers with a source of income whose impact on the natural environment is minimal. The only instances of potential forest disturbance are female butterfly capture for breeding purposes and leaf or seed collecting to feed larvae when farming is first initiated. After six months on average, farmers are breeding their own female butterflies and have often begun their own host plant nurseries, with little subsequent need to spend much time in nearby forests. Moreover, most butterfly species needed for breeding can be captured on forest-bordering roadsides. Finally, butterfly larvae feed on forest edge species, eliminating the need to collect host plants from inner forest areas (ABP-TA, personal communication)6.

Second, farmers often release wild butterflies after they have finished mating or laying eggs, potentially adding to the number of butterflies in the wild.

Third, ABE’s hope is that the existence of a viable alternative source of income will decrease villagers’ reliance on illegal forest-related income generating activities such as timber extraction and chameleon poaching.

Fourth, ABE intends to increased community support for local and global forest conservation. In theory, villagers’ participation in a forest-friendly enterprise should increase the goodwill between National Forest Reserve authorities and local communities. In addition, local peoples’ dependence on the biodiversity value of their surroundings should, indirectly, support the protection of natural resources on which they

6 Note that butterfly collection has never been cited as cause of extinction. The main cause is habitat loss (New, 1997).
depend, such as soil, fuel wood and medicinal plants. Eventually, enterprises such as ABE should contribute towards increasing local community support for the conservation of this globally recognized biodiversity Hot Spot.

**ABE activities promoting forest conservation**

**Environmental education**
The Community Liaison Officer is conducting environmental education activities with local schools and villagers. Through these activities, participants learn about butterfly biology and about the interrelatedness of sustainable livelihoods and forest health.

**Butterfly population monitoring**
The Amani Butterfly Project monitored butterfly populations in and outside farming areas during the first year and has recently renewed plans for this activity. Results will be shared with relevant government authorities including the Wildlife Division, the Amani Nature Reserve, the Longuza Forest Reserve, and EUCAMP.

**Threat reduction assessments**
Project staffs are slated to use McKnight Foundation funds to conduct threat reduction assessments every two years.

**Tourist attraction and educational display**
The enterprise maintains a Live Butterfly Exhibit adjacent to its main office, currently maintained by the office cleaner. It attracts a small but steady flow of visitors of various nationalities.

**Tree nursery**
The group is planning to initiate a tree nursery program among participant villages. The aims are two-fold: to produce useful trees and to plant butterfly host trees with the aim of increasing larvae fodder and butterfly populations within villages.

**Discussion**
Although exact figures are not available, the ABP estimates that no more than 20% the total number of families in each of the four villages is involved in butterfly farming (ABP-TA, personal communication). In proportion to the scale of the East Usambaras forest landscape and conservation needs, this implies a relatively minor impact. It can be argued in response that such limited coverage only increases the value of ABE’s additional conservation and development oriented activities, such as environmental education and educational displays, because they serve to multiply its positive influence on forest conservation attitudes and practices among participating villages and beyond. However, if these effects are to continue once the enterprise becomes independent, finances and incentives will need to be self-generated.

At present, three out of five conservation activities are dependent on donor funding. Of the remaining two, the tree nursery program has almost stalled due to lack of resources, and only the butterfly exhibit promises to sustain itself (mainly on entrance fees). As mentioned in Section 5, the hope is to incorporate additional conservation activities into the ABE 28% running costs budget as sales increase. Nonetheless, while such activities may be high on TFCG’s priority list, it remains to be seen whether they will form part of the enterprise’s own agenda once it becomes independent.

Finally, the consequences of improving the livelihoods of communities living adjacent to forests on forest conservation attitudes and practices can be multi-faceted, and are yet to be fully understood, in Amani and elsewhere. For example, while ABE may raise the conservation ethos of its members, it may just as easily enable them to diversify into potentially exploitative forest-related income generating activities,
such as expanding their areas of agricultural production (see the paragraph below on poverty reduction for details).

Pro-poor activities and other social benefits

Poverty reduction

The Amani Butterfly Enterprise contributes towards poverty reduction in three ways. First, it provides employment for the under or unemployed. The low levels of capital and land required to farm butterflies allow poor and landless members of the community to participate.

Second, the enterprise contributes directly towards raising the household incomes of member farmers. Indeed, by September 2005, net incomes of members had increased by an average of at least 15% that year (TFCG, 2005b). Similarly, a baseline survey carried out by TFCG in 2004 revealed that the average family earned US$ 358 in net annual income between 2003 and 2004, of which the $62 in ABE earnings per farmer for 2004 represents approximately 17% (Table 5). The high impact on incomes is a direct result of the enterprise’s policy of returning 65% of sales directly to farmers. In future, butterfly farming is expected to raise members’ household incomes by at least 25% (Morgan-Brown and Saidi, 2004).

Table 5. Results of Baseline Survey of farmers’ annual income and expenditures (May 2003-April 2004, N=46), compared with average annual income per butterfly farmer for 2004

<table>
<thead>
<tr>
<th></th>
<th>TSh 518,386</th>
<th>US$ 948</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gross income per household</strong></td>
<td>TSh 518,386</td>
<td>US$ 948</td>
</tr>
<tr>
<td><strong>Expenditure per household</strong></td>
<td>TSh 146,405</td>
<td>US$ 140</td>
</tr>
<tr>
<td><strong>Net income</strong></td>
<td>TSh 371,981</td>
<td>US$ 358</td>
</tr>
<tr>
<td><strong>Income from cash crop farming (biggest source of household income)</strong></td>
<td>TSh 200,447</td>
<td>US$ 193</td>
</tr>
<tr>
<td><strong>Average daily income</strong></td>
<td>$193</td>
<td></td>
</tr>
<tr>
<td><strong>Average income per butterfly farmer, 2004</strong></td>
<td>$62</td>
<td></td>
</tr>
</tbody>
</table>


Third, the Amani Butterfly Group’s Community Development Fund is a significant source of social capital for the enterprise (see Section 4 for details on the Fund's management). Not only is it a way of effecting wider social welfare improvements; it also serves as a form of compensation from butterfly farmers to their respective villages, in return for their use of the village community forests. This arrangement will only gain in significance once farmers’ incomes increase as projected. Most villages’ funds have not yet accumulated enough capital to warrant a project proposal (Table 6). Nonetheless, one village used Fund money to complete the roofs of two of its schoolrooms, with satisfactory results (ABP staff, personal communication). Another village is planning to extend the reach of nearby main grid electricity poles, thus allowing grid access to those households that can afford it.
Table 6. Community Development Fund per participating village, 2005

<table>
<thead>
<tr>
<th>Village</th>
<th>Amount in Development Fund (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kwezitu</td>
<td>TSh 783,921 $ 664</td>
</tr>
<tr>
<td>Kisiwani</td>
<td>TSh 286,152 $ 243</td>
</tr>
<tr>
<td>Shambangeda</td>
<td>TSh 225,048 $ 191</td>
</tr>
<tr>
<td>IBC Msasa</td>
<td>TSh 981,956 $ 832</td>
</tr>
</tbody>
</table>

Source: Amani Butterfly Project 2005 Annual Report

Fourth, the Amani Butterfly Project has recently tried to help members with disposable income to open savings accounts. However, out of 150 farmers who initially expressed an interest, only 10 had opened bank accounts by September 2005. Project staff concluded that members were deterred by a lack of basic reading and math skills - which cannot be overcome with short term training - and by prohibitive transport costs involved in reaching the nearest bank (1.5 hours by bus, costing farmers 30% of total annual savings). Community savings schemes are an alternative currently being considered.

Professional development

A large investment in professional training is both inevitable and imperative to any enterprise incorporating individuals with low levels of education, a narrow range of skills and limited entrepreneurial exposure. Since its inception, ABE has offered butterfly farmers and enterprise staff professional training opportunities covering a variety of subjects. For example, the ABP-TA has trained the ABP Manager and the Community Liaison Officer in computer, communication and management skills, to the extent that they can now carry out most management and sales activities, and the Liaison Officer is largely able to fulfill the Manager's role in his absence (TFCG, 2005b). Then, farmer groups have been trained in the basics of butterfly production, as well as entrepreneurial and organizational skills (Millinga, 2003). Professional training continues to be an integral part of enterprise activities as it enters its third year. As this case study was being written, the Manager was scheming to organize tree nursery training sessions, the Community Liaison Officer was out of town attending a class on community based micro-credit and savings schemes, and the farmers were slated to receive professional instruction in basic accounting and management skills, some of it targeted specifically at women.

Discussion

There is no doubt that Amani Butterfly enterprise’s consistent investment in social and human capital has contributed significantly to its development and success. With regard to human capital, key skills gained by farmers and staff alike have had a direct impact on productivity, income and financial management practices. Investments in social capital have had a less direct but no less significant effect. Thus, they have led to self-generated savings and credit groups, and to the creation of a landscape-level social organization that has given local communities a higher profile and greater negotiating power among local conservation and other authorities. Human and social capital, in turn, is generating physical capital for local communities, by enabling infrastructure improvements, but also by contributing towards the protection of village forest resources. As with the conservation activities, however, there are uncertainties pertaining to the financial sustainability of professional training and social development activities, and to the full range and complexity of their impact.

Financial sustainability of professional development and pro-poor activities

The great majority of pro-poor and professional development activities has been, and continues to be, funded by donors. Again, it remains to be seen whether these activities are slated into the management budget if and when the enterprise earns enough income to afford it, and once it becomes managerially independent from TFCG.
Impact of improved household incomes

There is a concern, increasingly expressed in the conservation literature, that boosting local wealth in biodiversity hot spots can multiply activities that are incompatible with forest conservation (Terborgh, 1999). In Amani, butterfly farmers’ increased ability to hire agricultural labor and build brick houses, both directly associated with ABE raises in income, represent activities that could, in theory, lead to increased clearing and timber extraction in local forests. It is worth noting, nonetheless, that according to the baseline income survey (Table 5) the average net family income for 2004 represented less than the UN designated poverty line of US$ 2 a day, even after adding-in 2004 butterfly farming earnings. Such low average incomes suggest that even a relatively significant increase in household earnings is unlikely to cause the destructive impacts typically associated with excessively high levels of natural resource consumption.

A final and as yet unanswered question pertains to the intra and inter-household impact of raises in household income of 15% or above. For example, have intra-household gender conflicts arisen, in particular, where women are the principal earners? Similarly, are projected increases enough to impact on patterns of socio-economic differentiation between households?

7. Intersection with government regulations and policies--enabling conditions

Macro-economic and policy environment

Amani Butterfly Enterprise benefits from an enabling policy environment, in the sense that its activities and goals are in line with the objectives and strategies of Tanzania’s Wildlife Policy, National Environmental Policy, and National Forest Policy. Indeed, it can be argued that the enterprise is actively contributing towards policy implementation.

As discussed in Section 2, the National Forest Policy offers particularly hopeful prospects for all forest-based communities in Tanzania. Forestry authorities are being forced to dialog with communities surrounding their jurisdictions, and the latter have been given the power to gain control over, protect and use adjacent forest resources to support their livelihoods, through a handover process that maximizes the long-term sustainability of village and community forest resources. As a result, communities have been freed, at least in theory, to pursue sustainable forest-based income-generating activities with legitimacy.

This does not mean that community forestry in Tanzania is free of complications. There are, for example, substantial delays involved in securing legal documents for Village and Community Forest Reserves. In addition, authorities’ attitudes and opinions are slow to change, partly because of the recent advent of these policies, and partly due to their radical break from past attitudes and practices. As a result, the success rate of community forestry and community forest-based enterprises in Tanzania will depend a lot on the key individuals involved (see below for details pertaining to this case study).

With regard to the policy environment surrounding private sector, the constraints and legal inadequacies can be formidable. The political commitment to liberalize the economy notwithstanding, most small to medium-sized businesses in Tanzania never get off their feet due to red tape entanglements, ill-timed or unrealistic charges and corruption surrounding business registration, permit acquisition and taxation (USAID/TIC, 2004). This said, ABE has been able to avoid major complications, and could, in theory, continue to do so after de-linking from TFCG (ABP-TA, personal communication). Another difficulty for small businesses is that there is little in the way of micro-credit loan schemes or other sources of startup capital. Thus, small businesses such as Amani Butterfly have to rely entirely on their own resources.

7 Bricks are commonly burnt in people's backyards via a method that require significant amounts of firewood.
Relationship to regional and locally based authorities

Local authorities, including reserve managers and the District Executive Office, have been largely supportive of the Amani Butterfly Enterprise, endorsing it since its inception (Box 5). ABE also has an amiable relationship with surrounding private tea plantations, whose owners allow butterfly farmers to walk through their forests and pick up seeds and leaves or capture the occasional butterfly (ABG Manager and ABP-TA, personal communication).

Box 5: Amani Butterfly Enterprise supporting institutions (2002)

- The District Executive Director of Muheza
- District Natural Resources Office
- District Agricultural Office
- Amani Nature Reserve Conservator
- Longuza Forest Reserve Manager
- The Manager of the East Usambara Conservation Area Management Program (now replaced by the Regional Catchment Forest Officer – part of FBD-MNRT)

Nonetheless, reserve authorities are generally struggling to adopt ‘people friendly’ attitudes. The Conservator of Amani Nature Reserve has done an admirable job in this respect, but both himself and the communities involved have had to struggle to come to an understanding about the nature of ABE. For example, despite ABE’s claim of representing a low impact activity, the Conservator has insisted on a zero-butterfly capture, zero foraging policy for Amani Nature Reserve, partially for fear of disturbance to wild butterfly and plant populations (Conservator, personal communication). This, in turn, may explain why the first four participant villages did not border this reserve. Moreover, it has understandably taken some time for the Conservator to be convinced that the enterprise is not actually selling reserve wildlife. The recent addition of two villages lying within reserve buffer zone is testimony to the improved relationship between the enterprise and Amani Nature Reserve management. Both parties have in fact reached a mutual understanding whereby the reserve agrees to permit butterfly farming in its adjacent communities, and the villagers agree to adhere to the zero-capture and foraging policy, and to rely solely on already-domesticated butterflies from other villages for breeding purposes. Moreover, the Conservator can be heard citing ABE as an example of sustainable livelihood activities (ABP staff, personal communication).

Finally, it appears that the desire to avoid potential frictions with authorities has led ABE to rely largely on informal agreements with local forests authorities -whether private, national or village-owned - surrounding the issue of forest access. While it seems to be working for the moment, this arrangement cannot guarantee long-term forest access to butterfly farmers. The risk inherent in these arrangements may be what is driving current ABE plans to establish host plant nurseries, as a way of reduce butterfly farmers’ dependency on nearby forests, among other advantages.

8. Ways forward and opportunities

Enabling environment

As discussed above in Section 7, Tanzanian Forestry, Environmental and Wildlife Policies are largely conducive towards forest-based CBE establishment. At the same time, policies and by-laws regulating private sector enterprises in Tanzania remain problematic and represent an underlying risk. This said,
there may be some improvements on the horizon, as the new government has just promulgated a new policy for Small and Medium Enterprises which seeks to address these concerns.

Potential to expand or replicate

Underlying risks notwithstanding, there is potential to expand butterfly farming to other locations within Tanzania and Africa. From the economic point of view, the African market for butterflies is as yet unsaturated, and the business of butterfly exhibits is growing. At the same time, this study revealed that sustainable forest-based CBEs in Tanzania could not be established in isolation from the broader framework of PFM implementation. Thus, ABE has been largely successful because PFM was largely accepted and under various stages of execution in the East Usambaras generally, and in the enterprise villages in particular.

Concurrently, the central and enabling role played by TFCG in providing high and sustained initial investments in professional training and institutional development have underscored the fact that such investments may be central to CBE success. This is especially true where members have low relevant skills and educational levels. In turn, this suggests that a supporting institution or institutions may also be a pre-requisite. In particular, institutions that can provide the following services to the CBE:

a) Additional funding sources to cover a variety of start-up costs
b) Professional training
c) A participatory framework of implementation, including a step by step plan for attaining CBE financial and managerial independence
d) An adaptive management style. This methodology is particularly significant in a context where cultural and socio-economic differences may create additional barriers to communication. In this case study, the advantages of adaptive management were exemplified by the immediate raises in productivity and managerial effectiveness associated with re-arranging productive units and hiring a female staff member.

In sum, ABE could be replicated elsewhere in Tanzania and Africa, but not without conducive policy and PFM backdrops, institutional support, and careful preliminary research on local forest resources and their potential markets, among other details.

Challenges and opportunities specific to Amani Butterfly Enterprise

Specific opportunities that emerge from ABE include:

- Potential to significantly expand production and sales
- Potential to achieve both managerial and financial self-sufficiency
- Potential to reduce poverty in member households
- Potential to contribute towards building human, social and physical capital through: i) a higher (landscape) level of social organization ii) infrastructure improvements and iii) professional training and development opportunities for CBE members
- Potential to affect local communities’ attitudes and practices in favor of forest conservation and the sustainable use of forest resources

Specific challenges that emerge from ABE include:

- Risk of losing vertical control over the enterprise if private intermediaries become involved in marketing the product
- Need to obtain legal status over the remaining VLFRs and to formalize agreements between ABE members and the surrounding forests they utilize
- Potentially high opportunity costs involved in de-linking TFCG from ABE, depending on the pathway(s) chosen. Risky areas include transfer of administrative accountability and of higher-level budget management and marketing skills
- Security risks surrounding payments in cash (specifically, danger of robbery)
References


