

BEEKEEPING IN SIERRA LEONE: A STRATEGY TO EMPOWER PEOPLE AND GENERATE INCOME

Submitted by:
Neighbours of the virtual community of Gbongay, Sierra Leone
www.nabuur.com
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In representation of the citizens of Gbongay, Pejeh Chiefdom, Pujehun District

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“We can’t help everyone, but everyone can help someone.”

Dr. Loretta Scott

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1. Executive Summary

Nabuur.com is a Netherlands-based organization founded by Siegfried Woldhek, former CEO of World Wildlife Fund (WWF)–Netherlands. The central belief of the organization is that citizens of developing countries can solve their own local problems if offered better access to resources that are available elsewhere in the world: information, existing solutions, expertise, ideas, manpower, and money. This problem of access is solved through the use of the Internet, which connects villages with volunteers worldwide who are willing to fulfil the villages' requests and provide them with resources.

The citizens of Gbongay, a rural village situated in southeastern Sierra Leone, have requested assistance in starting a beekeeping operation in their village. This small village has suffered the consequences of the civil war: their school and hospital were destroyed, and the only source to secure safe water was stolen.

This proposal has been prepared for Gbongay by its virtual community—that is, the volunteers of Nabuur. We seek an organisation eager to activate the Nabuur model: to empower the people of Gbongay themselves by involving them in every stage of the beekeeping operation, from the sourcing of raw materials to the processing of beekeeping products. Additionally, rather than requesting funds for the purchase of expensive commercial industrial equipment, the villagers have been encouraged to build simple equipment that can be upgraded to higher-grade equipment as the profits allow. In this way, the people of Gbongay will receive the resources to learn how to develop and run the business by themselves rather than receiving a handout package.

Based on our research into existing models and techniques for implementing beekeeping in rural areas and with the support and knowledge base of the Nabuur virtual community, it has been decided to run the project in a two-stage process.

- The first stage of the project, which has already begun, involves the set up of a beekeeping school. The participants in this school include a local carpenter, a local trainer, the local representative, and representatives from the families that will be involved in the second stage of the project.
- The second stage will commence once the villagers are able to sustain a beekeeping operation. During this stage more resources will be provided for them to scale up what was learned during the first stage. The second stage also will focus on giving the villagers tools that will make the operation sustainable and to ensure that they are able to run it without external supervision.

With the use of this model, the costs of running the project are substantially lower than in the case of providing them with the finished resources.

The total cost for the second stage that the community is aiming to obtain with this proposal is of 5,665.83 EUR.

2. Needs Assessment

The 1991–2002 civil war in Sierra Leone resulted in tens of thousands of deaths and in the displacement of more than two million people.

Although the increased GDP seen in the past year indicates the onset of a modest economic recovery, it is estimated that 70 percent of the population still remains below poverty levels, and that over 60 percent of the country's young men are still unemployed.¹



One of the three pillars of the poverty reduction strategy in Sierra Leone designed by the World Bank is promoting pro-poor sustainable growth for food security and job creation.² Similarly, the International Monetary Fund has indicated that one fundamental aspect of poverty in Sierra Leone—food poverty—is the consequence of an inadequate food supply coupled with low income. This is evidenced by the life expectancy of the people in Sierra Leone, which in 2000 was calculated to be 38 years.³

Gbongay (historically spelled Gbonge by Europeans) is a village that typifies the situation of Sierra Leone. Situated in the Pejeh chiefdom, in the Pujehun district at the southern region of Sierra Leone, this rural community of about 750 inhabitants (40% of whom are children) is engaged primarily in the subsistence farming of products like rice, cassava, and bananas. Before the civil war broke out in 1991, Gbongay had 120 houses. Ten years of brutal fighting devastated the village and the lives of its inhabitants. During the war, the village was burnt down by both the rebels and soldiers. Today, less than 15 of those houses remain habitable.

Beekeeping has been identified as an income-generating sustainable activity in different regions of Africa. Although Sierra Leone has a prolific local bee species and abundant melliferous vegetation, beekeeping is a relatively new activity in the area.

This project has been designed to allow the participants to grow and to evolve as an operation that could be easily replicated, thus involving more people after the initial operation is running.

¹ <http://www.cia.gov/cia/publications/factbook/geos/sl.html>

² <http://www.worldbank.org/ieg/prsp/>

³ <http://www.internationalmonetaryfund.com/External/NP/prsp/2001/sle/01/index.htm>

3. Project Goals

- To alleviate poverty by generating profit through the establishment of a honey production business
- To design a project that can grow continuously and involve more participants from Gbongay itself or from neighbouring communities without the need for continued external supervision

4. Project Description

Beekeeping is an activity that has been identified as an excellent opportunity for African communities as an income-generating activity. Because beekeeping does not require heavy labour or massive land use, it has the potential of turning even a small initial investment into an ongoing stream of revenue.

The project has been designed to decrease costs by training the participants not only in beekeeping techniques but also in carpentry, allowing them to construct their own hives once they are ready to replicate the pilot effort (Fig. 1). Furthermore, this skill will enable the Gbongay operation to train other communities if the latter show a desire to start similar operations.

Each stage of the project has been designed to maximise the involvement of the community by using local labour and resources to construct the hives, manufacture the necessary protective clothing, and for the training process.

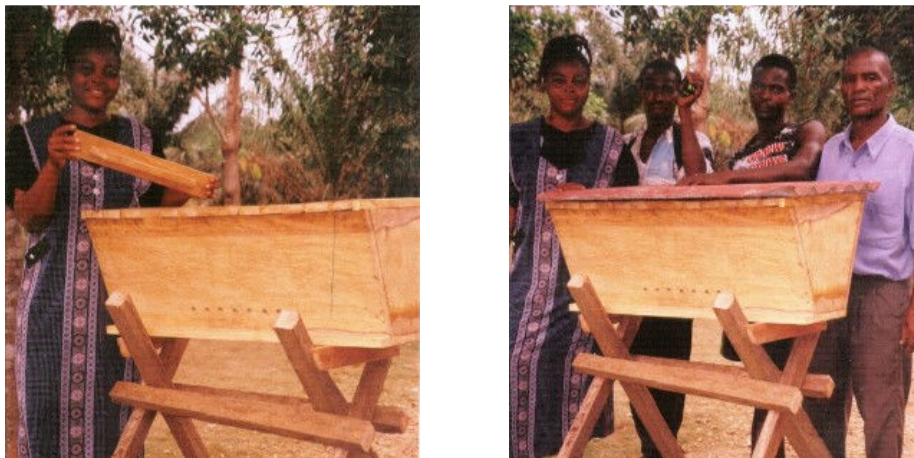


Figure 1. Hive manufactured by local carpenter for the project.

5. Implementation

The project has been designed to operate in two stages.

5.1 Stage 1

The initial stage, which is in progress and for which funding was provided by the virtual Nabuur community, included establishing a beekeeping school and providing its participants with the basic equipment needed for their training.

- **Equipment**
 - 10 Kenyan top-bar hives manufactured by a local carpenter
 - 6 sets of protective clothing
 - 1 smoking unit
 - 10 colonies for the first ten hives
 - Packing materials
- **Training**
 - The local representative has contacted a trainer who will spend one month with the participants to train them in beekeeping techniques.

5.2 Stage 2

The second stage will build upon the processes learned during the first stage. Stage 2 also will provide the necessary resources for the villagers to be able to replicate the process indefinitely using local resources.

- **Resources**
 - Construction materials to build five more hives per family
 - Materials to manufacture one set of protective clothing per family
 - Construction materials to establish a small carpentry workshop to manufacture the hives
 - Construction materials to build one honey extractor
 - Beekeeping tools (one set per family)
 - Packing materials
- **Training**
 - Carpentry: The local carpenter who manufactured the first ten hives will be hired to (1) teach the villagers how to manufacture more hives, and (2) build the small carpentry workshop and the honey-processing and marketplace facilities.
 - Management: One management expert will be hired to educate the participants on how to maintain their own units and to work together in a cooperative business.

6. Key Personnel

The project will be overseen by two teams.

1. Sierra Leone team: They will continue with the project once the support of the Nabuur personnel is completed.
2. Nabuur team: Providing support to the community.

Detailed information on each participant is included in Appendix C.

6.1 Sierra Leone team

- Local representative
- Local carpenter
- Local beekeeping trainer
- Local management skills trainer

6.2 NABUUR team

- Village facilitator/project manager
- Virtual neighbours

7. Budget

A detailed budget can be found in Appendix B.

Item	Unit cost (SLL)	Units needed	Total cost (SLL)	Total cost (EUR€) ⁴
Materials for hives	45,000	175	7'875,000	
Labour for construction of first 35 hives ⁵	10,000	35	350,000	
Protective clothing	60,000	35 sets	2'100,000	
Trainer wages (beekeeping)	400,000	1 month	400,000	
Hive tools	5,000	35	175,000	
Honey extractor	95,000	1	95,000	
Carpentry workshop	1'783,000	1	1'783,000	
Tools for carpentry workshop		1 set	950,000	
Initial colonies	20,000	35	700,000	
Transport costs	250,000	3	750,000	
Trainer costs (Skills management)	300,000	1	300,000	
Stationery, administrative and others	500,000	1	500,000	
TOTAL COST			15'978,000	5,665.83

8. Monitoring and Evaluation

The project will maintain two levels of oversight.

- The local representative will provide continuous updates for the duration of the project.
- The Nabuur community is seeking an NGO with a local presence to supervise the project onsite. Photographic documentation will be maintained during all stages.

⁴ A exchange rate of SLL2,820.07 per 1 EUR€ was used. Data obtained from www.xe.com on 29 March 06

⁵ The local carpenter will be contracted to train the villagers on the manufacturing of the first 35 hives. After that the villagers will build these by themselves.

10. Project Sustainability

10.1 Economic Sustainability

10.1.1 Repayments model: The model proposed for this project will be based on the following premises:

- 25% of the profits will be used to repay the funds provided. This percentage is recommended by a similar project developed in Kenya.⁶
- Cost of the sales and management of the repayments considered as a 10% of the sales.
- The loan is to be increased by a 15% effective interest per year (recommended by the Bank of Sierra Leone for community development credits).⁷
- Consumer prices are assumed to increase by 5% every year and are considered to be stable. This value is higher than the average of the data available after the end of the civil war.
- Part of the profits will be used to increase the number of hives per family by one unit per year until achieving a maximum of ten hives.
- The price of the honey in the local market will be set at Le10,000 per Litre
- One hive is considered to have a maximum production of 45kg and a typical range of 13–23kg.⁸ For the purpose of this study we will consider that the first year's production will be the lowest, with a potential to increase by 2 kilos per year as the villagers increase their experience, with a goal of a maximum output of 20 kilos per hive.

Figure 2 shows the projected cash flow for the first eleven years of the project. Details of this graph are in Appendix E.

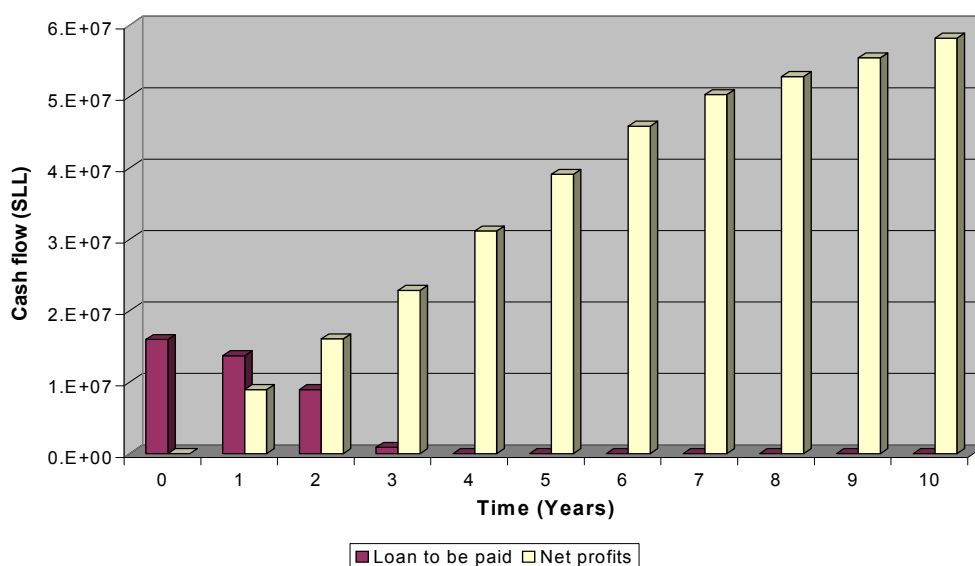


Figure 2. Cash flow with the time for the beekeeping project

⁶ <http://www.honeycareafrika.com/files/work.php>

⁷ <http://www.uncdf.org/english/microfinance/sectorDev/UNCDFSierraLeoneAssessment.pdf>

⁸ <http://www.beeginners.info/>

10.1.2 Marketing strategy.

After the ground work of the local representative of Gbongay and the contacts made by the virtual neighbours the following factors have been identified:

- In the local market, the honey is sold by volume, usually in 1 litre bottles.
- The local shops are able to buy directly from the community if offered a good quality product. They are paying to the suppliers an average price of 10,000 SLL per litre. The hives being used will ensure the quality of the honey is at the required specs for the market.
- There have already been initial conversation with local shop owners and interest has been shown. Local shops in Bo, Kenema, Makeni and Freetown have been identified as potential costumers.

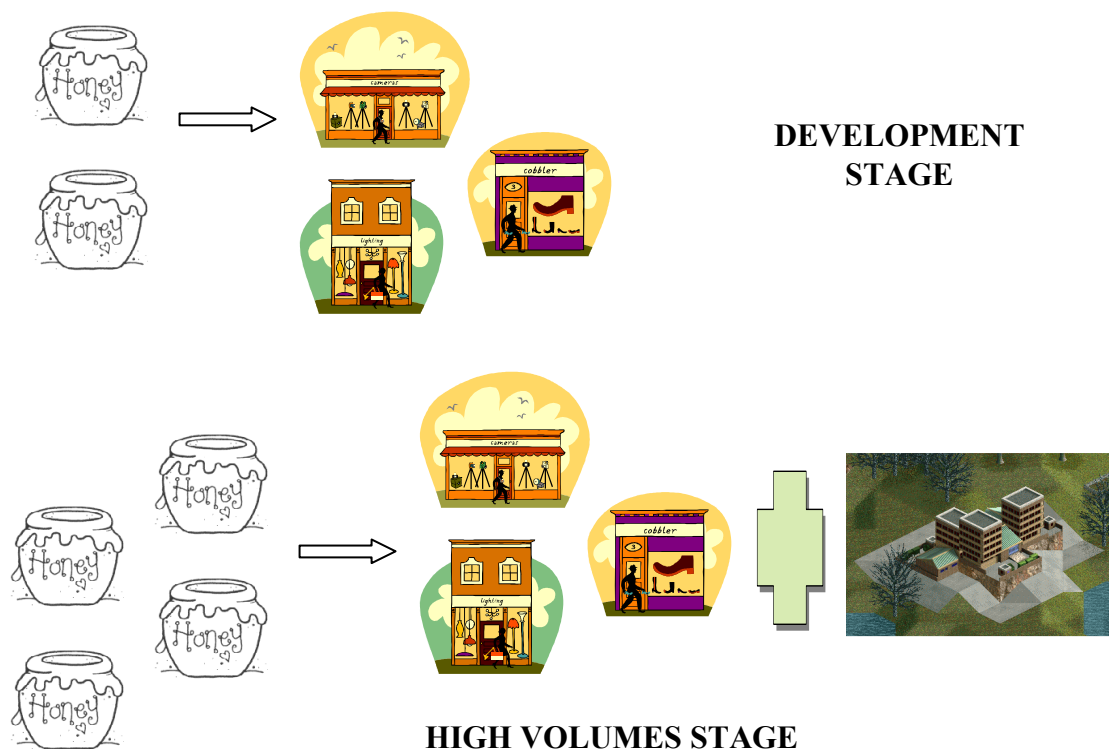


Figure 3. Strategy according to the production volumes

- Another alternative for of sale identified by the community is b y direct marketing, using the highway that is close to the community. This method is already used with other products.
- Recognising the need to open alternative markets, contacts have been made with Honey Care Africa that has expressed its interest on buying the honey once the volumes are higher than 1 ton. This volume will be achieved from year one (approximately 2.2 tons). From there, the honey produced will be divided between the one sold in the local market and the one sold to Honey Care Africa.

10.2 Political Sustainability

As with every nation on the African continent, the majority of articles concerning development in Sierra Leone gravitate around the central issue of whether it can achieve its Millennium Development Goals (MDGs) by 2015. Having now slipped inside the decade margin after the goals' conception at the UN Millennium Summit in September 2000, it remains to be seen whether such goals are achievable. Fierce debate continues as to whether the framework enforced by the UN Development Group (UNDG) is realistic. The disparity of inequality and stability among even the poorest nations shows that adherence to a "one size fits all" approach seems odd at best. Considering the uneven development paths of the heavily indebted poor countries (HIPC), emphasis is seldom placed on the politics: the emphasis that the MDGs are "time bound targets or policy consensus...a shared political consensus on global objectives".⁹ Politics within any HIPC remain a commonsense structural barrier to the MDGs' success; yet, escaping the rhetoric covered in UN documentation and general commentary, it is almost entirely forgotten that the politics of such goals, consented to or otherwise, distort and shape development. Policy could therefore become a barrier. Striving for the MDGs, paradoxically, could prevent a successful outcome in 2015. It is essential to explore this and other themes in relating politics and development in Sierra Leone, to see if the Gbongay beekeeping initiative is viable in the current climate.

The recent history of politics and development within Sierra Leone is not surprising of any country dependent on a closed portfolio of commodities. While 2 million people were displaced, with the holistic erosion of infrastructure and GDP falling by at least a third in its civil war (Fig. 3), development and politics have been traditionally intertwined in the country's diamond mines¹⁰. With high-yield, high-quality diamonds, vested interests from abroad guaranteed, along with agriculture, an export market that, as identified, produced substantial rise in GDP until the outbreak between the government and RUF in 1991. Minerals became intrinsic to politics and symbolic to power as they became central in generating economic growth and material wealth. Hence, control of the alluvial mines not only influenced the politic, but also controlled it.

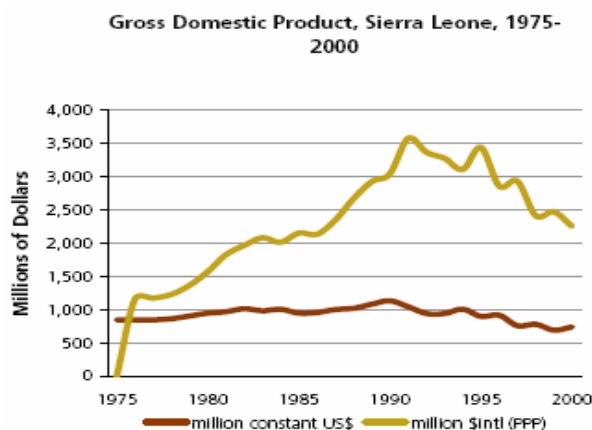


Figure 4. GDP, Sierra Leone 1975 – 2000 (Reuters, 2006)

⁹ <http://www.realityofaid.org/themeshow.php?id=19>

¹⁰ <http://www.tearfund.org/webdocs/Website/Campaigning/Policy%20and%20research/MakingEveryDropCount.pdf>

It is easy to see that there was little or no development for most of the 1990s. The unstable political landscape marred by enforced repression produced several years of negative economic growth,¹¹ of which the mining issue, the informalisation of commodities or *black market trade*, and ethno-religious friction all played a part. Conversely, the UN was active along with several development and humanitarian NGOs in bringing about applied schemes to the most impaired while trying to build capacity for political systems which had nearly disintegrated—not only by internal events but by the structural adjustment programmes the IMF had been imposing from the mid 1980s. It is perhaps fair to indicate that any movement towards unilateral development agendas such as the Lome Convention (1999) and the Millennium Development Goals (2000) was externally led. Not only did the RUF mobilise incendiary action against Freetown in this period but the government, innately fragile at best, faced the political consequences of economic bankruptcy as the UN moved to embargo the national diamond industry.¹² Sierra Leone, from around 2000, had to ascribe to a new set of development principles aligned to western exported neo-liberalism; yet as depicted in Figure 4, this brought about high levels of economic growth or *stag growth* (above 10%) while forcing inflation down.

	1999	2000	2001	2002	2003
	Act.	Act.	Act.	Est.	Est.
	(Annual percentage change, unless otherwise indicated)				
Income and expenditure					
Real GDP 1/	-8.1	3.8	17.9	27.5	9.3
Nominal GDP	14.9	10.2	20.3	22.8	18.3
Consumer prices (end of period)	36.7	-2.7	3.4	-3.1	11.3
Consumer prices (annual average)	34.1	-0.9	2.6	-3.7	8.2

Figure 5. Selected Economic Indicators (IMF, 2004)

The period of 2000–2005 overlapping the end of the civil war marks the beginning of the recovery and rehabilitation of Sierra Leone. As has not been unusual on the continent over the last ten years, the government has depended on external assistance for capacity building, policy, and regeneration activities while it concentrates on macroeconomic stability and law.¹³ While taking a passive approach to critical areas such as providing essential services casts the government in bad light, it is worthwhile for appraising the relative economic success of African nations further along in the process (i.e., Tanzania, Uganda). Halting insolvency may be the principle political goal in Sierra Leone, for it is the bedrock upon which sustained economic growth is built. As such, neo-liberalism that advocates Foreign Direct Investment (FDI), diversification, structural consolidation, and fiscal responsibility is now the framework for political decision-making.

The politics of neo-liberalism can be generally argued to be more receptive to development and organisations willing to implement schemes domestically, if only for the simple reason that it is about openness and operation to the rules of the market. This is clearly illustrated not only in the Initial Poverty Reduction Strategy (I - PRS) of 2003

¹¹ http://www.gdnet.org/pdf/draft_country_studies/SierraLeone-DaviesFR.pdf

¹² http://www.afrol.com/countries/sierra_leone

¹³ Maliyamkono, T.L (2006) *The Promise: Tanzania's Development Agenda*

but the Bo Declaration of the same year, amongst others. While the government is likely to resent a loss in autonomy in the short term, it really has little alternative and is now locked in the unilateral agreements as laid out by Lome and the MDGs. These are the keystones from which all domestic policy derive. Therefore an initiative such as a beekeeping project should be welcomed by government because not only does it constitute FDI inflow into Sierra Leone, but also helps to diversify an economy dependent upon a narrow commodity base. As long as the project does not contain subversive political matter of any kind, does not infringe on more sensitive areas of the economy (i.e., mining), and is fluent with domestic policy, it is likely to be sanctioned as long as the appropriate ministry is notified. Ministerial overview is pressed in African nations through having to adhere to good governance as a prerequisite to Overseas Development Assistance (ODA).

With the project aimed into a rural district like Pujehun, government facilitation may be higher than that for a project focused in or around Freetown. This is due to the emerging degree of failure on the part of neo-liberalism together with the pressure of delivering MDG results. Capital generally tends to accumulate geographically as a result of investment on the part of the private and public sector.¹⁴ The motive for the private sector is profit, while the motive for the public sector is solvency and the accumulation of wealth in the shortest possible timeframe. Ergo development clusters around poles, generally capital cities, and tends to deprive rural areas of capital. This produces inequality and an uneven pattern of development. While the government, with a set budget and aim of forcing down external debt, will seek to generate maximum return, productivity, and multipliers from the least input, it is likely to be agreeable with any private sector organisation that can pump capital into areas that attract little interest. As Pujehun is such a district—ravaged by the civil war and containing a high percentage of people living in abject poverty, probably with an extremely low GINI index—any initiatives are likely to be a bonus for the administration. Instead of bottom-up solutions, its line of political thinking generally extends more to the top-down approach in which economic growth raises income redistributed through enhancement in public services. More realistically, this does not tend to occur, as exposed in cases such as Tanzania (Dar Es Salaam) and Uganda (Kampala), where income is reinvested into areas where capital is already prevalent. Thus, it could be argued that politically, development is skewed by MDGs because government will focus on meeting targets by any method necessary, which can, ironically, reinforce poverty. With its full Poverty Reduction Strategy (PRSP) now in place as of 2005, it is not surprising that the strategy in its early years is more gauged towards maintaining functionality rather than total eradication of the phenomena. As such, on a domestic level, the government still does not have a political duty to 70.2% of its citizens living in abject poverty. On the positive side, abject poverty has declined by around 10% since 2000.

As regards the general political situation, the first successful local elections of May 2004 are still undermined by the impending general elections coming in 2007. With underlying tensions openly existing between tribes, the current detonator seems to again be in mining, where it is rutile, not diamonds, that spurs dislocation within the political elites. As the Afrol News has recently reported, there is still a specific lack of

¹⁴ *Massey, D* (1984) Spatial divisions of labour: Social structures and the geography of production. (<http://www.getcited.org/pub/102492051>)

democratic organisations and processes within Sierra Leone; however, donors are content that this can be expected as relating to its transitional phase.¹⁵

10.3 Environmental Sustainability

Definition

Meeting the needs of the present without compromising the ability of future generations to meet their needs: Encompasses keeping population densities below the carrying capacity of a region, facilitating the restitution of renewable resources, conserving and establishing priorities for the use of non-renewable resources, and keeping environmental impact below the level required to allow affected systems to recover and continue to evolve.

— FAO Glossary 2006

Sierra Leone is ranked 120th in the Environmental Sustainability Index (ESI) 2005 as conducted by the World Economic Forum (WEF)¹⁶ with a composite score of 43.4 and is consecutively ranked 32nd amongst NEPAD countries and 90th of the non-OECD countries.

I

The following paragraph, which provides an excellent starting point for this exposition, is extracted from a study of environmental sustainability by Nikki Skuse in association with Friends of the Earth (Sierra Leone):

“Even before the war began in 1991, Sierra Leone had isolated cases of environmental degradation, almost exclusively in the southern and eastern mining districts. The war resulted in intense fighting and diamond mining in the eastern district where the Gola forest, rich in biodiversity, was severely impacted. The underlying cause of environmental degradation in Sierra Leone is diamonds. While the war initially began for ideological reasons, it turned into a resource conflict over the precious gem. Diamond mining, predominantly carried out by independent diggers, is often done in riparian zones and causes soil erosion from constant clearing and digging of the land. Remaining holes become breeding grounds for malaria. Land pollution takes the form of water contamination, degradation of forests and siltation of rivers and creeks. As the war intensified and spread so did the number of displaced Sierra Leoneans living off the land and moving to the capital Freetown with an already fragmented infrastructure and deplorable sanitation. Displaced people turned from agriculture to raiding the forests for bush-meat and deforestation spread around refugee camps. The war resulted in illegal and unregulated logging that has rapidly deteriorated the Sierra Leonean environment.”¹⁷

¹⁵ http://www.afrol.com/countries/sierra_leone

¹⁶ WEF (2005) Economic Sustainability Index 2005 http://www.yale.edu/esi/ESI2005_Main_Report.pdf

¹⁷ Skuce, N. (2000). Skuce, N. (2000) Rebuilding After the War: Environmental Education in Sierra Leone, <http://www.onesky.ca/Green%20Teacher%20Article.pdf>

The phenomena that Skuse is outlining above can be delineated as that of qualitative depletion through war and the collateral results associated. This is not a new phenomenon—environmental theorists such as Glacken (*Tracing the Rhodian Shore*, 1980) have associated warfare as a propellant of degradation to the epoch of humanity itself, and there exists a strong correlation that much of the global decay taking place in the last century did, in fact, occur in a concentrated period between 1910–1950. For example, it has been proposed that the impetus for the Second World War began not with the invasion of Poland, as is more commonly accepted, but in the Axis coveting the industrialised Ruhr. The need to safeguard the environment, to utilise it within a sustainable context, stretches beyond the survivalist argument—it is needed to mitigate against conflict, against civil unrest as the cycle produces human and ecological rights violations, with a level of abject poverty and irreparable damage disassociated from more common forms of exploitation. UNEP’s Environment for Development program illustrates the importance meta-organisations now place on the dichotomy between politics and the environment. Political Ecology is a specialism that has long been annexed into academic or environmentalist circles.

Sierra Leone is currently within a post-conflict stage and the prospects of implementing environmentally sustainable projects have generally improved compared to ten years ago. Organisations that already operate such projects domestically include the UN, the World Bank, the Environmental Foundation for Africa (EFRA), Oxfam, and WaterAid, amongst others. At the policy level there is a strong adherence from government on whether it was willing to enter into these binding agreements or not. Agenda 21 (1992) effectively commits Sierra Leone to sustainable development, with Lome (1997), The World Summit (2002), and MDG Goal #7 further roping it into environmental responsibility. Whether the government is serious about these policies can be perhaps summarised by Deputy Minister Sesay’s address at CSD–13¹⁸ where, despite a call for more development assistance, the administration showed its commitment to sustainable development and, hence, environmental sustainability. This is engrained within its Poverty Reduction Strategy (PRS), which has produced both the National Environmental Protection Act (NEPA) and the National Environmental Policy (NEP). Furthermore, Kyoto has been ratified (2005) and work is currently ongoing with Cartagena. At this point a more positive dimension to the flux of environmental policy shows a framework for its implementation and enforcement. The National Environmental Commission (NEC) is active yet obviously, as with many African nations, questions remain over its effectiveness and coverage.

To state that war is the sole precursor for environmental degradation in Sierra Leone is a somewhat narrow view. The vast majority of accessible literature available over the Internet indicate in depth several other reasons that together present a very complex picture of circumstance. Projected population growth is expected to be 2.6% per annum¹⁹ until 2025, with density expected to almost double and the overall populace increasing by roughly one third to reach 9 million in that period. This strongly indicates that demographic problems will continue to plague a nation whose numbers were only

¹⁸ Sesay, I (2005) CSD-13 Statement.

http://www.un.org/esa/sustdev/csd/csd13/statements/2104_sierraLeone.pdf

¹⁹ GOSL (2001). Government of Sierra Leone Statistics (<http://www.sierra-leone.org/cso2001-population.html#Indicators>)

2.2 million in 1961²⁰. Environmental education, as Skuse argues, is virtually nonexistent outside of the formalised education system, and the written communication is unlikely to benefit the illiterate 70% of the population. Development theory has infinitely covered the positive progressive link between poverty and wanton ecological degradation. Furthermore, a lack of capacity prevents enforcement. Other sources of environmental degradation are listed in Appendix D.

With such a low ranking in the global environmental sustainability index, it is therefore critical that sustainability is implemented domestically to avoid having the environment exceed its regenerative capacity, a situation that will turn Sierra Leone into an archetypal Sub Saharan nation.

II

The beekeeping effort as proposed for Gbongay is intended to contain built-in sustainability measures to ensure that the project not only conforms to existing domestic policy and approval by the NEC, but also protects the local environment from exploitation while ensuring maximum yield. With our local representative, Mariama Fawundu, on the ground operating from Bo, Nabuur has coordinated an alternating feedback loop for both design and to obtain the relevant information for sustainable protocols. Some elements have not yet been fully ascertained and so in this aspect, the proposal will be under continual review.

1. Yield Harvesting

- Apiaries will be static as bees are continually in the area. This prevents shifting cultivation, which is typical in rural areas.
- Sites will be managed not only for honey but also for related activities such as wax and ointment production.
- Expansion of the project is proposed over the long term and will not be implemented until the small pilot is undertaken to determine its viability.
- Yields will be recorded and expansion of units managed at the local level.

2. Ground Erosion

- Due to the dense forest cover provided by emergents, primary, and secondary canopies, there is a minimal chance of ground erosion unless trees are completely removed (see Timber Harvesting, below), which destabilises the thick humus above the bedrock.
- Precipitation is mainly intercepted by biomass and the presence of bees, together with the high pollination levels around Gbongay, indicating that floral bed growth will accumulate.
- Human activity on sites will be restricted to owners, officials, or professionals, as well as for security purposes

3. Timber Harvesting/Deforestation

- The wood needed for the project is to be bought from a licensed timber producer several miles away from Gbongay. Apart from fuel needs

²⁰ ADB (1995). http://www.daco-sl.org/encyclopedia/4_part/4_1/adb_sl_env_profile.pdf

(supplied with deadwood), there is no timber harvesting in or around the community, as this has been banned by the village authorities.

4. Breach of Conservation Areas and Biodiversity

- There is an area adjacent to Gbongay under conservation: the Tiwai Island, an animal sanctuary. This is located some 15 miles south of Gbongay. As the beekeeping project will be located proximate to the village, there is no chance of incursion.
- By using the existing indigenous bees, the project will not impose radical changes to the ecosystem, thereby avoiding any disturbance or threat to the local biodiversity.

5. Contamination

- No pesticides or fungicides will be employed as these may negatively impact the flora and fauna of the area as well as the bees themselves.
- Discarded equipment and materials, including metals and plastics, will be transported to Bo for reworking (recycling in the traditional western sense is unavailable).
- Water used in project will be purified; discarding materials/refuge in water sources is banned.

6. Benefits

- Reduced involvement in environmentally unsustainable practices (farming, hunting, trapping)
- Reduced involvement in illegal activity involving environmentally unsustainable practices (logging, soiling)
- Increase in pollination levels through apiary practices

7. Education and Enforcement

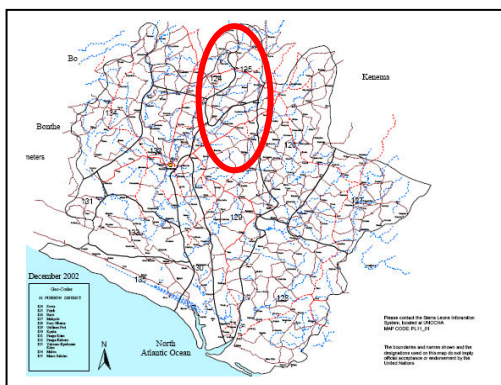
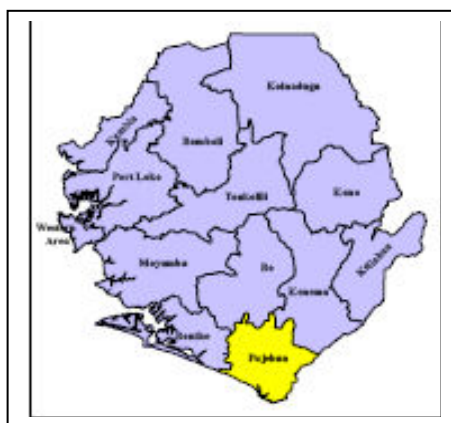
- Environmental education is currently under review at this time. With the local representative Mariama Fawandu, who is already receiving the Bees For Development journal, Nabuur is devising an initial plan to educate the community (in which literacy is very low). This will enable us to transfer the educational responsibility for beekeeping, as well as holistic environmental matters, to the local population as early in the process as possible. Inputs are expected from several organisations, including BFD, after their review.
- Enforcement of goals and monitoring of the project will be undertaken locally in accordance with administrative law.

Appendix A. Village Location



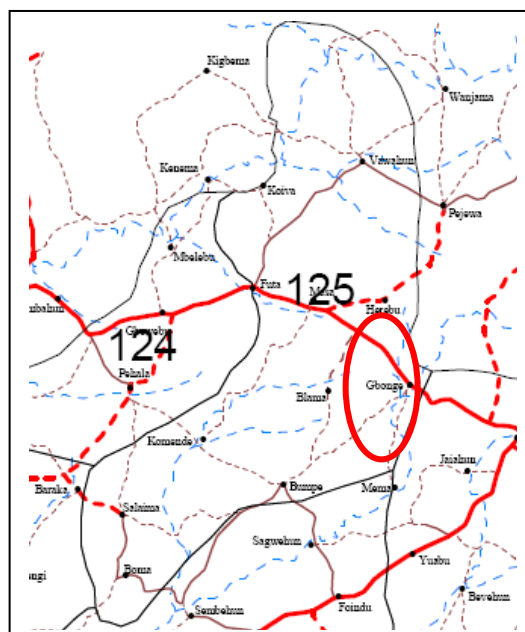
Sierra Leone in Africa

Pujehun District in Sierra Leone



Pejeh chiefdom in the Pujehun District

Gbongay (Gbonge) village in the Pejeh Chiefdom



Appendix B. Detailed Budget

Materials for Hive Construction

Item	Unit cost (SLL)	Units needed	Total cost (SLL)	Total cost (EUR€)
1 x timber 1"x2"x14"	15,000	2	30,000	
2 x galvanised sheet 2'x3'	4,000	1	4,000	
3 x glue	5,000	1	5,000	
4 x nails 2"	3,000	1	3,000	
5 x nails 1½"	3,000	1	3,000	
Total cost per hive			45,000	
TOTAL COST FOR 175 HIVES			7'875.000	2,792.81

Carpentry Tools for Constructing Hives

Item	Unit cost (SLL)	Units needed	Total cost (Le\$)	Total cost (EUR€)
Ripping saw (3' length)	85,000	1	85,000	
Cross-cut Saw	25,000	1	25,000	
Tenor saw	45,000	1	45,000	
Jack plane no. 5	65,000	1	65,000	
Jack plane no. 4	55,000	1	55,000	
Hammer	10,000	1	10,000	
Spoke shaves	25,000	1	25,000	
Sharpen stone	9,000	1	9,000	
Crowbar	20,000	1	20,000	
Wooden files	15,000	1	15,000	
Mortise chisel	25,000	1	25,000	
Twist bits	30,000	1	30,000	
Retches braces	25,000	1	25,000	
Screw drivers	18,000	1	18,000	
Trans square	10,000	1	10,000	
Angle square	25,000	1	25,000	
Plane blade	25,000	1	25,000	
Measuring Tape–16' length	8,000	1	8,000	
F-clamps	180,000	1	180,000	
Bench vice	250,000	1	250,000	
TOTAL COST FOR TOOLS			950,000	336.91

Materials to Construct Carpentry Workshop

Item	Unit cost (SLL)	Units needed	Total cost (SLL)	Total cost (EUR€)
Timber - wall plate: 2"x4"x14'	5,000	6	30,000	
Timber - rafters: 2"x4"x14'	5,000	20	100,000	
Timber – purlins: 2"x3"x14'	4,000	12	48,000	
Wire nails, assorted	6,000	20	120,000	
C.I. sheet	420,000	3	1'260,000	
Roofing nails	20,000	3	60,000	
Timber for entrance door 1"x12"x14'	15,000	4	60,000	
Timber for exit door 1"x12"x14'	15,000	2	30,000	
Timber for work bench 2"x12"x14'	30,000	2	60,000	
Timber for work bench 1"x12"x14'	15,000	1	15,000	
TOTAL COST FOR THE CARPENTRY WORKSHOP			1'783,000	632.36

Materials To Construct Honey Extractor

Item	Unit cost (SLL)	Units needed	Total cost (SLL)	Total cost (EUR€)
Timber: 1x12x14	15,000	2	30,000	
Metal unit for plates, spring and handle	25,000	1	25,000	
Bolts and nuts	2,000	6	12,000	
Wire mesh	3,000	1 sq yd	3,000	
Labour	25,000	1	25,000	
TOTAL COST FOR HONEY EXTRACTOR			95,000	33.69

Appendix C. Key Personnel CVs

Sierra Leone Team



MARIAMA FAWUNDU – Local Representative

Born in Gbongay, Mariama studied community development at the Booker Washington Institute in Liberia. Until the outbreak of the Liberian civil war in 1989, she worked for the Ministry of Rural Development in Liberia as Community Development Aide, assigned at Sanniquelle in Nimba County. After returning to her native Sierra Leone she started working for NGOs such as Shelter Foundation in different community development programmes. For the past years she has been involved in women development programmes. She currently lives in Bo, 45 miles away from Gbongay.

MARTIN SANNOH – Beekeeping Trainer

Martin has been involved in informal training delivered by the Catholic Bishop in the Diocese of Kenema while serving as a social worker there. His experiences include training many individuals and some organizations around the Kenema district in Eastern Sierra Leone in improved beekeeping

SHIAKA KARGBINI – Local carpenter

AMBOSA BAYO – Local trainer in management skills

Bachelor of Economics – University of Sierra Leone

Nabuur Team



CHRIS HOARD – Neighbour, UK

A graduate of Portsmouth University, Chris has recently returned from undertaking project work for an NGO in Tanzania, East Africa. In addition to his academic interests, which include writing journal articles and general research, Chris is a keen musician who enjoys theatre and eating out. He is also a UN Volunteer and in the process of entering the Royal Geographic Society as a fellow.



LINDA BERRIS – Neighbour, USA

Linda holds a master degree in biology from the University of Illinois, and is a former veterinary technician. A writer since 1998, she has maintained a lifelong concern for civil rights and humanitarian issues. She lives in Chicago with two cats, one dog, four dusty guitars, and many books.



ISABELLA CESARINI – Neighbour, Germany

Isabella holds a degree in Economy and Finance from the university La Sapienza of Rome. She has a vast experience on project management and risk assessment gained after working with companies in different countries in Europe thanks to her fluency in different languages.



SENESI FAWUNDU – Neighbour, Sierra Leone

Senesi is interested in helping boost the efforts of the Local Representative and in joining his hands with the rest of the neighbours already registered in the village as he believes that together, we can all make the difference.



JASON TIMERMANIS – Neighbour, Canada

B. A. from Concordia University in Montreal, Canada. Jason spent several years writing and teaching in Tokyo, Japan. In his spare time Jason enjoys reading and volunteering. He has previously volunteered in the areas of literacy, children's development, and homelessness issues. After attending the 2004 International AIDS Conference in Bangkok, Thailand and travelling Cambodia, Jason became involved in issues concerning developing nations. He currently resides in Toronto, Canada and will be volunteering at the 2006 International AIDS Conference to be hosted there later this year.



EDWIN SCHENDERLEIN – Neighbour, USA

Edwin works providing complete lighting services for motion picture or video production. His experience as a gaffer and director of photography includes seven feature films, and numerous commercials, short films, and music videos.



RAUL CACERES – Village Facilitator, Australia

A graduate of University of New South Wales, Raul has gained experience in the meat, dairy and cereal industries in the areas of quality assurance, food safety, process development and project management. He joined Nabuur as part of the UN volunteering online program and has also gained volunteering experience working with kids with intellectual disabilities for several years.

Appendix D. Causes of Environmental Degradation in Sierra Leone

- High dependence on fragile uplands for food production
- Heavy dependence on wood biomass as source of energy and construction materials
- Inefficient use of available energy resources
- Inadequate energy and power supply
- Bush burning and shifting cultivation
- Annual bush fires and overgrazing
- Over-exploitation of natural resources
- Neglect of women and youth in natural resource and environment management programmes
- Poor land use planning and management
- Limited land tenure security
- Over-dependence on the environment for livelihood
- Poor sanitation and underdeveloped waste disposal systems
- Lack of capacity to monitor environmental pollution
- Hunting and increasing consumption of wildlife meat
- Under-developed livestock sector
- Weak environmental conservation/management capacity
- Limited knowledge among the population about the need for sustainable utilization and management of environmental resources
- Weak capacity to monitor and enforce environmental legislation and policies
- Limited application of Environmental Impact Assessment (EIA)
- Corruption and mismanagement
- Poor database on the environment
- Loss of biodiversity

Appendix E. Detailed Cash Flow

Year	0	1	2	3	4	5	6	7	8	9	10
Number of hives		5	6	7	8	9	10	10	10	10	10
Production per hive (kg)		13	15	17	19	20	20	20	20	20	20
Production per hive (L)											
Honey price per Litre (SLL)		10,000	10,500	11,025	11,576	12,155	12,763	13,401	14,071	14,775	15,513
Projected profit per family (SLL)		464,286	675,000	937,125	1,256,850	1,562,794	1,823,259	1,914,422	2,010,143	2,110,651	2,216,183
Projected total profit (SLL)		16,250,000	23,625,000	32,799,375	43,989,750	54,697,781	63,814,078	67,004,782	70,355,021	73,872,772	77,566,411
Cost of the sales and management		46,429	2,362,500	3,279,938	4,398,975	5,469,778	6,381,408	6,700,478	7,035,502	7,387,277	7,756,641
Projected repayment per family (SLL)		116,071	168,750	234,281	314,213	390,698	455,815	478,606	502,536	527,663	554,046
Projected repayment total (SLL)		4,062,500	5,906,250	8,199,844	10,997,438	13,674,445	15,953,520	16,751,196	17,588,755	18,468,193	19,391,603
Additional hives (SLL)		45,000	47,250	49,613	52,093	54,698	57,433	60,304	63,320	66,485	69,810
Net profit per family (SLL)		303,214	459,000	653,231	890,544	1,117,398	1,310,012	1,435,817	1,507,608	1,582,988	1,662,137
Total net profit (SLL)	0	10,612,500	16,065,000	22,863,094	31,169,053	39,108,914	45,850,415	50,253,587	52,766,266	55,404,579	58,174,808
Loan after payment and interest (15%) (SLL)	15,978,000	13,702,825	8,966,061	881,150	0	0	0	0	0	0	0
Loan remaining to be paid (SLL)		11,915,500	7,796,575	766,217	0	0	0	0	0	0	0