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An Assessment of Tree Planting Activities and Opportunities In Sierra Leone

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Summary of Recommendations

1. **Any tree planting intervention should begin with a consideration of the five key factors affecting the tree planting decision.** Between income, access to land, security of land tenure, access to tree planting resources, and community norms and leadership, which are the true barriers to tree planting in the community? This sort of careful assessment must be made in every community to ensure that resources are used efficiently.
2. **Through consultation with both community members and scientists, make sure that seedling varieties are appropriate to local conditions.** The planting of thousands of Acacia trees is largely monocropping of non-indigenous specie and must be recognized as such. Acacias are fast growing and can serve as emergency buffer to receding forest but never a substitute to the natural forest. Therefore, endemic tree species should be planted in forests reserves so as to maintain Sierra Leone's great biodiversity. Because Acacia burn well, it could be useful on firewood plantations instead.
3. **Focus on educating communities about the benefits of tree planting and train them in the technical skills necessary.** Tree planting is an economically viable activity that should occur without outside intervention, if properly explained and if other barriers to planting are not strong such as lack of land access. Some people have already recognized the economic and intrinsic benefits to tree planting but do not know how to maintain a nursery. Careful targeting of communities for educational efforts could save both time and money, as once people have established a tree planting culture they will continue to do so independently.
4. **Greater coordination is needed between local and central government officials, NGOs and other stakeholders.** There are hundreds of people working for Sierra Leone's environmental future, but often they do so independently or adversarially and thus compromise each other's efforts. More frequent meetings across levels of government and between key stakeholders, at both local and national levels, would help with the building of trust and greater collaboration. This could be achieved through the creation of local, regional, and national Forest Councils that ensure all stakeholder's voices are heard.
5. **More research on and dissemination of energy-efficient stoves, fish processing methods, home construction, fire prevention methods and charcoal production.** This would greatly lower the demand for wood without great cost. Because energy-efficient devices are often more cost-effective as well, individuals are typically willing to invest in them as witnessed with the improved banda model.

6. **NGOs and government offices should help people explore other income options that are not dependent on forest resources.** Lowering demand for wood could have detrimental effects to unemployment. Complementary programs should be put in place, such as the support of alternative livelihood schemes, to support this transition.
7. **Tree planting interventions must be long term.** Organizations must expect to be involved with a village for the entire lifetime of the tree specie and budget accordingly. Giving food for work to plant trees will by no means ensure that people are prepared and willing to maintain the trees over the long run. Food or other payment should not be used as a motivator if other barriers to planting will render the effort unsuccessful, unless lack of food is the barrier itself.

This report honors the work of devoted individuals and organizations, and also aspires to support it further. It is a call to action for collaboration with Senehun, Tombo, and Rorainka, as it has clearly articulated ways that cost-efficient, effective interventions could have a great impact. We invite any organization to use our recommendations as the basis of successful programs in these specific communities, and to use their lessons in many others across the country.

For recommendations specific to forest management in these three communities, please consult the following pages:

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I. Background

While Sierra Leone has commendably addressed many of the immediate difficulties in the post-conflict era, future societal stability will rest heavily on its ability to move towards environmental sustainability. The people of Sierra Leone depend on its rich supply of natural resources for a variety of economic, social and cultural needs. Green Scenery, a non-governmental organization which considers a healthy environment to be a basic human right, takes as its charge the protection of such resources. It pursues this objective by working with communities through education and other specific actions, and also seeks to collaborate with the government and other stakeholders in the formation of sound environmental policy. With the belief that sound policy requires careful research, Green Scenery has embarked on a series of investigations which will be used to promote such policy.

The following report is the result of a four-month research effort coordinated by Green Scenery staff, with extensive assistance from Sierra Leonean around the country. Researchers conducted household surveys in Freetown, and employed a combination of randomized surveys, focus groups and participant observation to examine approaches towards tree-planting and forest management in three villages: Tombo in the Western Area, Senehun in the South Province, and Rorainka-Malkia in the Northern Province. While data were collected on a variety of environmental topics, and can be requested from Green Scenery, this report will focus on approaches to tree planting, which is currently the main focus of pro-environment governmental and non-governmental activity. Through a careful examination of the constraints and opportunities facing local communities, Green Scenery has developed specific policy proposals for government agencies and NGOs seeking to build effective initiatives in this crucial area. These include a reconsideration of the tree species offered to communities, strengthening local partnerships, and clarifying access to long-term land rights.

II. Introduction

Shrinking Forests

Besides from its famous diamonds, Sierra Leone has incredible wealth in its forests. Sierra Leone is part of the lower Guinean forest belt, such that "50% of the country climatic conditions are suitable for tropical rainforest," according to Sayer et. al. He estimates, however, that by 1990, only 6% of this land still contained " mature, dryland closed forest." It is extremely difficult to accurately quantify the extent of deforestation in Sierra Leone given that many data sets are incomplete, or use different standards of what qualifies as a forest. The following is a piecing together of the history of deforestation in Sierra Leone, which will place the current study within context.

Examining available data, it appears that the vast majority of deforestation in Sierra Leone occurred during the 19th century due to the extensive timber trade, along with slash-and-burn farming practices. When two officials from Britain visited Sierra Leone in 1909 and 1911 to record the country's resources and create a local Forestry Department, they noted that, "Probably in the earliest

times the whole territory was covered with some kind of arborescent growth varying from open savanna and deciduous forest to close impenetrable evergreen rain forest. Now scarcely 1% of this forest remains." Most accounts from the early 1900's indicated that just 1-3% of Sierra Leone's 7,162,000 ha (i.e. 71,620-214,860 ha), was still covered by closed forest by the 1930s.[1]

As secondary forests grew throughout the late 20th century, forest cover appears to have increased. In 1976 Gordon et. al estimated that 261,000 ha of closed canopy still thrived. But, during this period logging activities increased as well, and thus by 1990, the FAO found only 219,000 ha of productive forest, 119,000 ha of which had already been logged.[2] Since the war no surveys have been conducted, and subsequently there is no consensus as to how exactly the forests were affected. Certainly, the one to ten-year disruption of farming experienced in most communities slowed down the deforestation due to slash-and-burn agriculture. But, fires started and paths cleared by fighters, along with general environmental disruption during the conflict, had the opposite effect. Also, mass migrations of people to the relatively safe Western Area, in addition to natural population increases, created unprecedented demands on western forests.

Thus it is difficult at this moment to quantify the extent of environmental damage—or improvement—during the conflict, it is clear that the conflict heavily shifted geographic patterns of resource-use. While this study did not venture to determine the optimal amount of forest for Sierra Leone, based on the hundreds of interviews conducted across the country, we conclude that forest rehabilitation is desired by Sierra Leonean given its numerous economic and social benefits. People want to reverse what has been a trend of deforestation over the past 200 years.

Previous Responses by Key Stakeholders

A handful of government agencies and NGOs have worked to protect forest resources in Sierra Leone. The Forestry Department has a small but dedicated staff with limited ability to enact the forestry laws. As the FAO reported in 1990, "The Forest Service has not been provided with adequate development and operational resources to enable it to function effectively in so far as the conservation, protection, planning, management and utilization of the national forests are concerned."[3] The forestry laws are also antiquated and undergoing review: fines and fees currently listed have not been adjusted for fluctuations in the value of the Leone, such that fines are so small, they would be unpayable in the currency denominations in issue. For example, the extraction fee for a class IV pole with butt diameter under 4 inches costs Le 4, even though the smallest denomination is Le. 50 .[4] This is just one of many concerns of a department which is working to reconstruct itself after 10 years of disruption.

[1] In Fairhead and Leach, 138.
[2] Allen, T., Consultant. Tropical Forestry Action Plan Inter-Agency Forestry Sector Review Mission Report. UNDP/FAO, 1990.
[3] Allen, T, 1990.
[4] The Forestry Regulations, 1989. In June, 2003, Le. 2,400 was the equivalent of 1 USD.

The conflict prevented many forest guards from manning their posts, and since the conflict the government's priorities have been elsewhere, leaving the department under-funded, and occasionally without any funds at all.[5] Currently, forest guards patrol forests to prevent encroachment, and also manage several nurseries in order to provide free seedlings (primarily *Acacia mangium* and *Acacia auriculoformis*) to communities. Lack of seedlings is not a constraint to planting in communities near forestry nurseries: despite the great number of seedlings made available to people, few actually plant trees, a concern which will be addressed in this report. Also, some communities which would like to plant trees do not have transportation to receive seedlings from forestry, which can be a major constraint.

The newly-formed Environmental Department is charged with the supervision of environmental impact assessments around the country, but is also limited by its lack of staff, transportation and facilities. Finally, the Wildlife Department, a long-standing supporter of Sierra Leone's biodiversity, helps manage wildlife within the nation's protected areas. These three departments comprise most of the government's commitment to the environment, which is insufficient to manage Sierra Leone's vast resources. Thus several NGOs have emerged to work in partnership with the government.

NGOs and UN organizations with significant commitment to the environment in Sierra Leone include the Environmental Foundation for Africa (EFA), Conservation Society for Sierra Leone (CSSL), the FAO, Friends of the Earth, Fourah Bay College, Green Scenery, Gola Rainforest Conservation Program (GRFCP), Njala University College and the UNDP. These organizations have focused on educating people nationwide, planning tree plantings, and advancing policy goals with the government. The relationship between local NGOs and the government is often described as adversarial, as they compete for control of funds from international donors and the management of wilderness areas.[6] Several leaders expressed interest in collaborating more closely on mutual goals. To this end, this report will attempt to address issues in tree planting projects of both NGOs and governmental organizations, acknowledging the crucial role both can play in their success.

III. The Economics and Politics of Tree Planting

In July 2003, a government-maintained nursery in John Obey held 10,000 acacia seedlings. The forest ranger who had carefully raised the seedlings was eager to give the seedlings away to people for planting, but no one in the local communities ever approached him. If the economic and social benefits of tree planting are clear, why would people not want to plant free seedlings and improve their personal welfare? A careful examination suggests that the cost and availability of seedlings is only one of many constraints on the tree planting decision.

[5] Anonymous interview with central government official
[6] Anonymous interviews with government and NGO staff

Income

Almost all villages with access to highways sell firewood, charcoal or timber as a primary source of cash income. This income becomes especially important during the "hunger season" in the late summer, when rice reserves have dwindled. Firewood is primarily sold at Le. 200 for a 4-5 stick bundle, charcoal is 5,000 Le a bag, and timber can fetch Le 500-1,000 per board. Whether or not this a good price depends on the amount of labor effort necessary to expend in the production of the commodity, which varies greatly given people's varied access to forest resources. For the women of Tombo who walk 6 to 12 miles a day to fetch only a few bundles of wood, carried on the head, vending firewood is a form of subsistence. For the men near Senehun who use chainsaws or hire work teams to harvest timber, vending is quite profitable.

Planting an acre of trees, assuming the seedlings are provided for free from the forestry department or an NGO, requires resources very similar to those necessary for farming: tools and labor. One significant difference is that tree crops require long-term access to a piece of land, whereas annual crops require a one-year lease. Tree crops, however, are extremely profitable when compared to rice: an acre of mature acacia trees sold as firewood could provide an income of approx. Le 80,000, whereas an acre of rice would provide approx. Le 20,000.[7] Thus assuming that people are well-educated as to the relative profitability of tree crops, it appears that they would allocate some of their labor towards lumber or firewood-bound tree crops, potentially maintaining rice and vegetable crops simultaneously as a form of food security. This is not observed, however, and some probable reasons will be considered below.

Access to Land

Land tenure is structured differently in the various districts of Sierra Leone. The colonial structure governed the Western Area distinctly from the other provinces, such that private land tenure has been common for the past century in the West, whereas communal land tenure is more common in other areas. Population density in most of the country remains quite low, such that most families hold more land than they are capable of farming or otherwise engaging. In the Western Areas, given the vast migration during the war, land is a more scarce resource and primarily controlled by native families who provide mostly one-year leases to outsiders.

Since Acacia trees require a three to five-year commitment, individuals or groups who wish to plant must be guaranteed consistent control of land for at least this period. Other valuable native species such as Terminalia ivorensis, Chlorophora regia, and Heritiera utilis require 10 to 30 years of growth, and thus a strong guarantee of long-term use rights. Access to land significantly affects people's investment opportunities: one study in Ghana found that families with clear land rights were 28% more likely to invest in tree crops.[8] The lack of such

[7] This calculation assumes that there is no opportunity cost to the land, and also that after the first year tree maintenance takes a negligible amount of time: therefore the profit margin is quite possibly inflated as stated.

[8] Besley, Tim, Property Regimes in Africa.

land rights in many Sierra Leonean communities, as will be examined in the case studies, is one major obstacle to increased tree-planting.

Security of Land Tenure

It is possible for a family to have access to lands in name or on paper, but still have significant doubts as to whether they will see the fruits of their labor in five years. Most immediately threatening is the possibility of continued civil unrest. While the violence of the conflict ended three years ago, Sierra Leone is by no means stable, and situated in a rather unstable region. Eruption of more conflict could once again force people off of their land, returning with their tools and crops destroyed. It could also cause greater refugee inflow from neighboring nations, which in turn places strain on property rights.

In addition to concern over future conflict, other sources of insecurity include runaway fires, difficulty preventing the stealing of crops, and fear, as yet unfounded, that the government will later claim that all land planted with acacias is in fact government land. In an environment of uncertainty it makes far more sense to plant short-term crops, behavior which is currently observed.

Access to Planting Resources

Since tree planting has not been a staple activity of most Sierra Leoneans, significant resources, and most notably, education in tree maintenance, must be provided in order to enable planting. People also need seedlings and tools, which could be accessed through the government, the NGOs or the private market. It is important that people are offered seedlings of tree species they feel are useful, and are made aware of programs which offer seedlings. Community perception of a lack of access to planting resources, or distrust of the acacia species is another barrier to increased planting efforts to be considered.

Community Norms and Leadership

The tree planting decision is, in most cases, a private one, but it has numerous positive externalities for future and present community members and thus it is in the interest of community leaders and government officials to promote tree planting in both public and private domains. Whether leaders are able to raise people's enthusiasm for tree planting efforts, especially on communal or government land, is an important factor in whether or not communities engage in tree-planting. Sierra Leonean leaders exercise control over forest resources through the "sawei", or laws of the "poro" secret society, in addition to central government legislation.[9] The scattering of people disrupted the activities of the "poro" societies, and their reconfiguration may play an important role in continued local forest management. Additionally, during the conflict people did not have to follow forestry laws while exploiting forest resources, and with the reinstitution of forest rangers people must become more conscientious or potentially face consequences.

[9] Lebbie, Aiah R. et. al. Resiliency and Change in Common Property Regimes in West Africa: The case of the Tongo in the Gambia, Guinea, and Sierra Leone. Society & Natural Resources, 10:382-402, 1997.

Summary

While tree planting has many important environmental consequences, for most people, it is solely an economic decision based on cost-benefit analysis. This is not at all to imply that Sierra Leoneans do not care about the environment, biodiversity, nor have an intrinsic appreciate of nature, but solely to note that people must place immediate subsistence before any other goals. Whether tree-planting is desirable on the basis of cost-benefit analysis encompasses more than just a simple consideration of the income different activities generate, and thus, given property regimes, whether an individual should invest in planting on their own land or contribute their labor to a community plot. Institutional and structural barriers to tree planting can distort what appear to be clear economic incentives and thus deter it.

IV. Case Studies

In the following case studies, it will be made clear the way that these five key factors, among others, affect the planting decision. Recommendations emerging from the case studies will be both general and specific, given that certain limitations are society-wide whereas others are rooted in local circumstances.

Case Study I: Senehun Village, Southern Province

Population and Geography

Senehun is a small village with 126 households and approximately 1,500 people. It is located 27.2 kilometers west of Bo, and according to the Section Chief, was founded over 100 years ago. Its area is very vast with most landowners not certain of how many acres they own, only that they have too much to count. The Section Chief believes Senehun contains over 100,000 acres. The town includes a government forest reserve, in addition to privately owned forested "bush" lands, but over time the savannah grasslands have increasingly encroached on bush land. The Section Chief says that in the 1950's 80% of land had forest cover, but that since then 60% of forest land has converted to savannah grass due to slash and burn agriculture. This is something of grave concern to most villagers, who will mention this as one of the greatest concerns they have as their ability to farm is compromised. Also, as bush land becomes scarcer, fallow periods have shorted. The Women's Development Association leader estimates that fallows have fallen from 10-12 years to 5-7 years in the last decade.

Senehun

Households – 126

Approx. Pop. – 1,500

Distance to Bo – 27.2Km

Land Area estimate according to chief - 100,000 Acres

80% land was covered by forest in the 1950s

60% land now covered by savannah grass from slash and burn agriculture.

Fallow period has dropped in the last decade from 10 -12 yrs to 5 – 7 yrs.

Government Structure

In Sierra Leone, chiefdoms outside of the Western Area have different government structures and land tenure systems which reflect the colonialists' preference for indirect rule. Senehun is the center (figuratively, rather than geographically) of the Kamajei chiefdom, Moyamba District. Its government hierarchy from top to bottom is as follows:

A District Officer is responsible for the entire Moyamba District and is appointed by the central government in Freetown. While technically a non-political appointee, according to one local leader in recent years political party affiliation has become more important. Moyamba district is made up of fourteen chiefdoms, each ruled by a locally-elected Paramount Chief. The Paramount Chief is responsible for all members of his or her chiefdom, and is custodian of all lands. Though male Paramount Chiefs are more common, both men and women are allowed to hold the position in Mende tradition as long as they are from a "ruling house," i.e. descend from a well-established family in that chiefdom. (The initial selection of paramount chiefs by the colonial rulers was considered to be arbitrary, but the status conferred on ruling houses has continued to influence the selection of chiefs). As one leader explained, "Women have a greater

potential to bring development because they are fair. Women aren't crooks...they fear scandal more."

The Chiefdom Speaker is second in command to the Paramount Chief. He is responsible for keeping contact with the Section Chiefs, of which there are seven for the seven sections of the chiefdom. Within those sections are seven to eight villages, which each have a village chief and council of elders, loosely defined as those with knowledge and influence in the community. Members may be of varying ages, and include both men and women. The local chief and village elders, otherwise known as chiefdom counselors, are approved by a voting council, which contains one representative for every twenty taxpayers. All political positions are for life unless a grievance is brought against a leader, in which case a town meeting can be held, and he or she can be removed.

Local chiefs have significant economic and social influence in their villages, controlling many decisions that relate to land use, forest management and development efforts, as they may actively solicit development funds, or organize public works projects such as tree plantings. Since the Paramount Chief is the custodian of all lands, he has significant influence over their use and thus his attitude towards deforestation can greatly impact the community's response to the issue. He may use his power to enforce protective community norms in regards to forestry, or create a climate where forest over-exploitation is acceptable or encouraged through either indifference or example. Some leaders use their privileged position to disregard community norms regarding forest resources, knowing that villagers "will not dare to challenge [local leaders]."[10] As will be considered in greater detail throughout the three case studies, differences in community leadership are a major factor in whether or not communities adopt forest management policies and actively engage in tree planting.

Local Government Finance

Political leaders are supposed to receive an annual salary, besides from occasional gifts from constituents, at a rate of Le 80,000/month for the Paramount Chief and Le 50,000/month for the Chiefdom Speaker. This is roughly commensurate with the salary of a local NGO leader or federal official. The Chiefdom Speaker of Senehun, elected in 1992, said he had only received one year of pay over his 11 years in office. Salaries are supposed to be paid out of local taxes collected, which are very small since they lack consistent inflation adjustment, and are set by the central government. Local chiefs do not have the power to officially levy local taxes without first receiving permission, though they may benefit greatly from gifts, bribes and other informal methods of taxation. Since in a community like Senehun, the majority of income is derived from forest products, the lack of compensation for village leaders only compounds the problem of encouraged forest exploitation.

[10] Anonymous resident of Senehun

All men and women over 21 who are not disabled or elderly pay Le 500 a year, with additional taxes for those involved in specialized businesses. Those who sell in the market pay Le 10,000 a year for the privilege of their table, and blacksmiths, carpenters and tailors pay Le 10,000 per machine they own. The largest taxes are for those involved in the timber trade, who pay Le 100,000 for each power saw, and Le 50,000 for each handsaw operated. According to Senehun's Treasurer, Mr. Tucker, law dictates that the permit price should really be Le 200,000 for a power saw but people can "beg to make it less." This tax goes to the District Forest Officer, in addition to taxes on the boards themselves which are paid to the local government, forestry and the bush owners. Only one power saw operator from nearby Bo has made any payments in the last year, giving Le 30,000 to bush owners, Le 6,000 to the Paramount Chief, Le 24,000 to the chiefdom administration and Le 40,000 to the forestry department.[11] While Tucker is aware others are harvesting timber from the forest reserves, he says that enforcement is very difficult and thus no other money has been received. Another village member noted that people give bribes to the Paramount Chief to evade payment of the full tax.

Poles made from the kandi (Anisophyllea spp.) tree are not taxed, and nor is firewood vending, despite being the main economic activity of the community. One leader explained that chiefs "don't dare tax them (firewood vendors) because they will say you are not a good chief and it will reflect on your children." Firewood and kandi pole collection therefore incur no private cost beyond the effort it takes to gather them, and thus their social cost is greatly undervalued. Since, however, these are subsistence activities with small profit margins, most intensively pursued by poorer members of the community, taxation of them would only lead to greater poverty, and by extension, increased harvesting of forest products.

All taxes are difficult to collect because activities can be kept hidden, as is often the case of handsaw operators, or because a person can beg for, and most likely be granted, exemption at a time of hardship. Taxes are supposedly levied to cover the costs of salaries and development projects in the community, but taxes rarely stretch to meet the cost of salaries for the chiefs, treasurer, police chief, etc., and some claim they are also misappropriated by their collectors. Thus development funds come primarily from the NGOs. This means that tree planting efforts must be supported by the central government, NGOs, local leaders or individuals if they are to occur.

Land Tenure System

The Paramount Chief is custodian of all lands and thus has the authority to govern the use of it; in practice control of lands rests at the family level. Families do not hold land papers, but they generally know the boundaries of their land by sight. All members of the community have access to land through their family connections, or if they are strangers in the community, they can receive it by

[11] Quantities indicated in the Treasurer's records.

paying a token to another community member. Rarely, however, do people receive long-term access to a piece of land; plots are granted for a year's harvest of rice. There is little demand for longer-term use rights, given the risky nature of the post-war climate and the high level of time and money necessary to begin tree farming. Residents note that they would be willing to give leases for longer periods of time but people do not request it. They do not fear people claiming the land the as theirs since families hold land papers certified by the government. When land conflicts arise, they are either resolved between families, with the Paramount Chief, or in extreme cases, by the District Officer or in higher courts.

Some women have property but most land is owned by men. Traditionally land is passed down to males in the family, though this has been changing. As one woman explained, "it used to be that they just gave land to the boy child...once you get married you have no business to your fathers property unless you ask your other brothers...but then they said human rights, gender equality and now sometimes it's different." She said that "they" speaking are the NGOs and President Tejan Kabbah, who has made "50-50" and "gender equality" commonly known phrases even among non-English speakers. Another woman explained, "...you can get land when your father and mother die if you were born in this town. Both girl child and boy child get it. When your husband passes away you get his land, but if your husband leaves you the pekin [children] get the land and you get nothing. If you don't get pekin, except by gods grace you get by." Women expressed significant difficulties in getting access to land, and even controlling land does not mean having control over the resources contained within it. Women who do own land reported difficulty in preventing men from stealing kandi (Anisophyllea spp.) poles from them as they do not have the strength or time to patrol and protect their land themselves. "At times people get into the bush at the end of the day, cut sticks and take them to the street. They do it on my land, without my permission every day! Many women have this problem" reported one widow. Another woman said she took a man to court over such stealing, and while he was ordered to pay a fine he never did so. Only one woman out of twenty-six consulted said she felt she was able to defend her land adequately. She received land through her family, and reports that people go to her when they want to use her land, or otherwise consult with her father or brothers. They must give her money or a portion of the harvest in exchange for use, and if they are family members she will most likely allow them to use it for free. It is interesting to note that this woman's father and brothers are actively involved in the protection of her land, however, and thus she is afforded more protection than a widow alone.

The War's Effect on Senehun

The civil war caused incredible damage to the community and its institutions. In 1995 RUF rebels came and burned over 50 houses and killed more than 26 people, while also destroying the animal stock and stealing food. As one man reported, "26 people we saw die with our own eyes and more we found in the bush." The RUF, CDF and government troops remained in the area

until 1997 when ECOMOG forces drove them out. All the chiefs left for fear of attack, as did some families, but most people stayed. The Paramount Chief went to Bo for his safety. "During that time when rebels knew that I was fighting [by organizing civil society] they arrested me and put me in prison for a day. The women in Bo striked and they released me. They beat me, flogged me and dragged me into my cell. They broke all of my fingers. I escaped and prayed to God."

When asked if people had the same respect for the local government when the chiefs returned, a local leader responded, "Yes, because they voted the government back into power...the people were elated." Still, people observe that village-level laws and family bylaws are more often disobeyed now, a fact they contribute more to the widespread poverty caused by the war than by the absence of authority over the three year period from 1995 to 1997. For example, dependence on firewood and timber sales increased substantially after the war, along with illegal exploitation of forestry lands. As one man explained, "deforestation was a problem before the war, but is more of a problem now...they [men] go in the bush and just take what they want."

Economic activities using forest resources

Almost all economic activities in Senehun involve forest resources. Most residents practice agriculture privately, except for a few teachers, merchants and laborers on larger plantations. Laborers are paid Le 2,000 to Le 4,000 a day. Other families have difficulty calculating a daily or even weekly income as cash income from firewood and timber sales are very volatile. Agriculture is almost entirely subsistence, and while most families have diversified their risk by engaging in a number of activities, the selling of firewood has been the primary source of income for most families since the war.

Farming

Land used. Most families practice slash-and-burn agriculture on small plots 0.5 to 3 miles from the village. Rarely do farmers know exactly how large their plot is, though some report farming 3-5 acres, or that they produce 5 to 10 bushels of rice annually. A women's agricultural group has also been quite active and collaborates on a four-acre plot. Most families farm their own land though some have to beg to borrow bushy land each year because theirs has been exhausted. Much of the land cultivated under the slash and burn method has converted to grassland (bole land). All expressed a desire for tractors as this would enable them to farm the bole lands, and thus lessen their dependence on forest lands which are more difficult to clear and often further away from the village. Tractors are available from the Ministry of Agriculture for Le 70,000 an acre, and from a community member for Le 10,000 an acre which is still quite expensive for most. Also, the tractor from the Ministry of Agriculture did not come until May which was already too late to be useful.

Besides from the bush, farmers also use swamp lands in the interior for rice as they tend to flood and do not require fertilizer. On other plots farmers prefer to use fertilizer when they have the finance. NPK 15-15, 17-17, 20-20 or urea is the varieties used. They cost Le 70,000 to Le 100,000 per 50 kg bag and thus are prohibitively expensive for most.

The slash-and-burn method of agriculture effectively clears land, but burns are difficult to control. In 2002, for example, seven houses burned to the ground after a fire started on a plantation spread rapidly. This incident was the cause of significant conflict in the community with those affected threatening to burn the house of the responsible family. Uncontrolled burning is a significant problem in the community, with at least one fire per year causing damages. Local laws against indiscriminate burning were set 2 years ago by the village chief, in response to "a fire set without good reason." This law is rarely used, however, because the chief reports it is difficult to determine exactly who started a fire.

Crops planted. Before the war most people planted ginger and sold it commercially, but these crops were destroyed during the war. People have switched to more subsistence farming, and to depending more on firewood sales for their cash incomes. Families plant primarily rice, and intercrop other commodities such as cassava leaf, groundnut, okra, cassava, potato, benni seeds, beans, "koojah", etc. It is difficult to determine exactly how many farmers intercrop, as when a farmer says he farms rice it is usually implied that his wife is also intercropping. Rice is considered to be the man's crop, and the woman can intercrop her crops with the rice, or use last year's land to create a vegetable garden to supplement the family's food supply and to sell. When asked about this division of labor, one woman explained that, "Yes, rice belongs to the husband but all other things in the farm belong to the woman...this was true before the war but now men are trying to interfere with that. Why? Because of the deforestation, there is less income to be had." Incomes before the war tended to be divided between the man and the woman, with the man providing staple foods, clothing and shelter and the woman providing additional food in the hunger season and paying for school fees. If a woman had good sales from a vegetable crop one year, she would be relatively free to invest her money in another venture. Now that women have less control over their incomes it is more difficult for some women to engage in and initiate development activities.

Citrus, guava, oil palm, pineapple, coffee, kola, yemani[∞] [Gemelina arborea], banana, coco and mango trees are occasionally planted, but as these are slow-growers those who must 'beg" for land annually from family members are not able to plant them. These crops also require a greater level of capital investment, as the seedlings are costly. They were popular before the war, but most burned down when the rebels came, and people have not had the money to replace them, despite their interest in doing so.

[∞] Mende name

Firewood production

All farmers cut, bundle and sell wood after burning their land for the year's plot. The plot is brushed in February with a machete and large trees are felled with an axe and left to dry. The plot is burned in March, after which the wood is cleared and brought to the road whenever the family wants income. Some pay others to collect and sell the wood for them. Others sell the rights to the wood to another person. Only in few cases where people's farms are extremely far from the road do they just leave the wood or use it solely for home consumption. At the end of the season farmers also dismantle their fences and sell them as firewood. All tree species are collected, though people prefer to use tijoi[∞] [Phyllathus discoideus], kpakpei[∞] [Albizia spp.], twanye[∞] [Ochthocosmus africanus], black tumbla[α] [Dialium guineense] and ndawei[∞] [Parinari spp.] trees at home.

Clearing and cutting the wood is primarily done by men since it considered hard physical labor and more suitable to men; however women without husbands say they are capable of doing the work as well. Women and children participate in the splitting of wood, tying of bundles, and transport of wood by head to the road. There the wood is sold for Le 100 per bundle to trucks passing by. Though multiple farmers may have their wood piles by the road at once, one or two men will act as representatives for the others in vending to the trucks.

Two other types of wood harvesting were mentioned by people as being done, though no one will admit to doing them since they violate local custom. One is the "false fires" method, in which people burn bush with no intention of farming and instead simply harvest the wood. The other is for people to cut raw wood from the bush, then sell it as firewood once it dries out. Given that firewood is sold year-round, and a four-acre farm may only yield 27 double piles, it is likely that these activities do occur, especially during the time of the hunger season between May and August. Firewood observed being sold by the roadside in July had a mixture of burnt and raw wood although vendors insisted all firewood was harvested from their family farms. A forestry department official noted that firewood and kandi[∞] [Anisophyllea spp.] pole sales "will result in disaster in the long run but what they say is that there is no other way to get money so they have to do that to earn their living."
It is interesting to note that while firewood sales are still marginally profitable, charcoal production was tried and abandoned. According to Christopher Roberts, caretaker of a large plantation in Senehun, it costs Le 6,000 to process a

[α] Krio Name

50 kg bag of charcoal, plus Le 2,000 for transport to Freetown. Since the going price in Freetown is Le 6,000, and in Bo, Le 4,000, "it's just not worth it."

Timber Harvesting

Some households in Senehun, and others in surrounding villages, are engaged in the harvesting of timber from the forest reserve and from private lands. There are two types of timber harvested. One is the pole of the kandi [Anisophyllea spp.] tree which does not require further processing. Kandi [Anisophyllea spp.] poles are sold for Le 5,000 on the side of the road, primarily to trucks heading to Freetown. Kandi [Anisophyllea spp.] trees are almost exclusively cut by young men on forestry land, on the land of their extended families, or on the land of others in the community, with or without their permission. There are three groups of men from Senehun who cut together and others from neighboring villages. Kandi trees [Anisophyllea spp.] appear to be scarcer as more individuals return to the Senehun after the war and choose between various potential income sources, such as farming and kandi [Anisophyllea spp.] harvesting. A chief in a nearby village of the Kamajei Chiefdom reported that "the young men have to go three or four miles now [to find kandi trees [Anisophyllea spp.]...they used to go close but the elephant grasses are spoiling the bush...I have to recommend to put stop to the cutting of the sticks...the time comes for farming and they refuse to farm and just cut sticks for quick income."

There have been some efforts to regulate the activities of Kandi [Anisophyllea spp.] harvesters, but all have been unsuccessful. Especially in cases when Kandi trees [Anisophyllea spp.] are cut from privately-owned land, people are reluctant to pay a fee. Forestry has not gotten involved in their regulation, which some say prevents wood cutters from taking local threats seriously. The same chief mentioned above said, "There is a law that no one can cut in the bush but it is violated because of financial reasons [family bylaws, not community wide]...young men don't like it because it is tedious work. They are educated but jobless." In June the Paramount Chief, along with the Treasurer and Chiefdom Speaker, had the vendors sign a document saying they would begin paying royalties but so far none have been collected.

As noted above, kandi poles [Anisophyllea spp.] are not taxed, and several women reported that young men take kandi trees [Anisophyllea spp.] from their land without paying a due. When this was mentioned to a community leader, he responded adamantly that this would be impossible as it violated community norms, but as the war brought new levels of uncertainty to the village such norms are sometimes challenged as people struggle for income.

People are rarely engaged in the production of boards for construction because this activity is considered to be the work of the Temne tribe, and not the Mende people. Most of those who harvest timber in the nearby forest reserves are residents of other villages. Two people in Senehun own power saws, but one in renting his out to operators in the Pujehun district, and the other is broken. Occasionally someone will hire workers from a neighboring town to harvest

timber with their capital (saws and land); for example, in May 20 Temne men were brought from Yile by a villager and were living together in one room in Senehun. They say they can produce 100 boards a week with their 7-foot saws, cutting 10-15 boards from each tree. The land they cut from is ¼ a mile from the village in the forest reserve. Preferred species include yemani [Gemelina arborea], yawi∞ [Heritiera utilis], semi∞ [Anthostema senegalense], baji∞ [Terminalia invorensis], kujage∞ [Terminalia superba], yawi, senjei∞ [Crudia senegalensis], and kundee∞ [Uapaca guineensis] . The workers are paid Le 3,500 to Le 4,000 for each board, which their employer sells by the road for Le 5,000. The profits from the timber are supposed to be split four ways: between the chiefdom authorities, the people who cut it, the people with the capital required to cut (power saws or handsaws), and the central government, but no taxes had been collected at the time of writing.

Forest Management: Role and Responsibilities

Department of Forestry

The forest reserve is 9 miles long and one mile wide, extending from Senehun to Pelewahun. The chiefdom owns it but the government has managed it for 35 years. Four forestry guards manage the region and are under a District Forest Officer in Moyamba. In Moyamba, Forestry undergoes a variety of projects such as the building of eco-stoves and tree planting. In Senehun, however, forest rangers focus almost entirely on patrolling the reserve, and do so on foot. The guards have split the reserve into four sections and are supposed to patrol daily, but as they consider their Le 60,000 monthly salary to be grossly inadequate, rangers devote significant time to other tasks, such as farming and selling firewood. Also, as the Forestry Department is a sub-division of the Department of Agriculture, at times Forest Guards are borrowed by a regional Agriculture Officer to plant rice or perform other tasks that take them away from the forest reserve. The combination of lack of pay and a lack of clear demarcation between forestry staff and agricultural extension staff greatly limits their ability to both protect the forest reserve and encourage reforestation efforts. They are also in limited communication with local leaders, making coordination difficult. There is often tension between the forest guards and local community members: as one resident noted, "We consider them [to be] getting tax payer's money and working for themselves."

Although central government officials say that permits for the cutting of timber are not required, rangers in Senehun issue them and timber producers are pressured by the Chiefs to pay for them. Before the war timber producers paid a

fee for every tree felled, as indicated in forestry laws, but in recent years timber producers have paid 20 out of every 100 boards produced, of which 8 go to forestry, 6 to the town chiefs and 6 to landowners. This is perceived as a more profitable arrangement for the village and for government, as they can sell the boards. Forestry workers have also charged Le 8,000 or Le 10,000 per tree on top of the board contribution. They do not receive a receipt for this transaction, as it is an informal tax not uniformly levied.

Tree plantings have not been organized by forest rangers in over 30 years. In the 1950's forestry sponsored a nursery with Acacia mangium, Acacia auriculiformis and yemani trees, which were planted along the roadside. People say that the descendents of these trees planted in this era are the same as those currently being harvested for timber. Dr. A. B. Karim of Fourah Bay College revived the nursery in Senehun in the 1980's while researching acacia trees, though these seedlings were replanted in another area as part of an experiment in alley-cropping. His success encouraged forestry to begin teaching this method in Senehun. As one leader reported: "Forestry used to instruct about nitrogen fixing before the war...they brought acacia and advised to intercrop a row of Acacia with rice. Then you'd cut leaves and use them for fertilizer." Acacia seedlings continued to grow naturally in the place where Dr. Karim's nursery used to lie, but an uncontrolled fire consumed them after the war. The uncertainty provided by fires creates a disincentive to nursery creation as seedlings may not live to be planted.

Department of Agriculture

An Agricultural Instructor (AI) serves Senehun, among other neighboring villages, by holding sensitizations to new farming methods and supporting the women's agricultural groups. Within four sections in Kamajei Chiefdom, 150 women have worked together to create four communal vegetable gardens. Ascot, a local NGO, appointed him to support the plots and told him he would be paid Le 150,000 a month to supervise the work of two chiefdoms. Still, he has not received any payment after a year of work. He continues to work with them regardless, as he says his role is more as an advisor than a leader: "This is a women's program. I only give confidence to the women. That is my work. I give them confidence not to give up." The women in Senehun have intercropped pepper, maize, garden eggs, rice and okra, using seeds collected by the AI over a period of two months. 30 to 40 women come together from 7 to 9 every morning to work on the communal plot before going to their family rice farms. The proceeds from their sales have been used to purchase inputs such as fertilizer, hoes and shovels.

The Agricultural Instructor says he has advised farmers to intercrop trees but reports that "few farmers have benefited...they lost interest because they engage in other activities. They need quick money so they focus on faster-growing crops rather than trees." He would like to hold more sensitizations but cites lack of staffing as a problem. The Town Chief similarly reported that only 5%

of farmers intercrop nitrogen-fixing trees after they harvest rice to improve the soil quality. More do not do so because "they have not been sensitized to it."

NGOs

NGOs have provided substantial support to the people of Senehun as they work to reconstruct the community. Projects in recent years include the construction of a school by an organization called SAPA in Freetown, a health center by the European Union, a community center by Cause Canada, and a house for the Paramount Chief by DFID. CARE International provided seed rice and food-for-work after the war, as rebels had destroyed it all. They have also provided food-for-work for the maintenance of roads, bridges, and other community projects.

When the researcher first requested a meeting of farmers in Senehun, people did not come until encouraged by a community leader. One woman explained, "Why are people reluctant to come when they ring the bell? Becomes NGOs come and promise, and leave and don't come again." In this focus group of 10 male farmers and 6 female farmers, people were very critical of the NGOs and of one NGO (referred to as X for the point of discussion) in particular. One farmer explained, "They say brush this for six miles. We will give you food. Then they don't...they promised zinc [for roofs] and food and didn't provide them...X is responsible for all villages in this district and has failed." Another commented, "X is keeping other NGOs out and it is hurting the area." Another farmer added, "X used to give seeds and inputs to farmers but always did it too late. July and August they bring seeds, and we need to plant in April. So we just eat it. And X asks for you to give it back: they give you one bushel and ask for one [bushel after the harvest], but you can't even plant it so we break even."

The Section Chief also noted that after the March fire, when 7 houses burned down, "four NGOs came to talk and did nothing...[a government agency/NGO partnership] came and collected information but if you try and ask them what happened they will tell you to sit until you get tired, that the boss isn't there...I went and asked what happened but I have no transport to go again, it cost me Le 3,000." Despite dissatisfaction with the efforts of the NGOs, at the same time people hoped for greater NGO involvement and stressed that they did not have the resources to undergo development projects on their own.

Before the war, the people in Senehun had little contact with NGOs. Some villagers were concerned that increased NGO presence, combined with increased poverty, has affected the community's work ethic. One community leader spoke very critically of food-for-work in particular. "It became a pattern for the NGO to use it to get people to do anything, this food-for-work...it makes our people lazy... if I want people to plant trees, they will ask me for food-for-work too, and I will tell them that these trees are for your benefit and for your children. They will appreciate that."

No NGO has specifically addressed environmental issues in Senehun, and in fact some projects have caused conflict related to the use of timber, one of which will be considered below. In July 2002 an NGO began the reconstruction of a primary school in Senehun and asked for a community contribution of 200 boards. This caused significant disputes over who would have to provide these boards, and at what cost. While this NGO perhaps should have predicted that such struggles could occur and taken steps to prevent it, this incident is most telling about the way funneling resources through community leaders can often invite conflict, perceived or actual. Some villagers expressed concerns such as, "Money gets subtracted at all levels so we never see it." Regardless of whether or not these allegations are true, at the very least their perception can make it difficult to encourage community cooperation.

Community leaders

People in Senehun expressed the need for more action by community leaders to protect the forests, and in general, to support development efforts. One man said,
"I am working in the interest of the community but get no encouragement...money comes [from NGOs] and they don't give it to the community." Several people were concerned that both village residents and leaders were harvesting timber from the forest reserve without the permission of the village council, and without paying the required royalties to people in the community. The Paramount Chief explained that "if anyone wants to cut a tree, they must consult me first since I am custodian of the lands." Yet, recalling the incidents above concerning the harvesting of kandi trees, along with other reports from forestry of illegal wood harvesting, it appears that this rule is sometimes broken. People in the village therefore point to the importance of not only creating effective laws, but having leaders who are willing to enforce them both on themselves and others.

When asked about forest management, local government officials said it was primarily the responsibility of the central government. Yet, there appears to be little communication between the central government and local government in regards to forest management. The local leadership expects tree plantings to be organized by the Forestry Department, and report not having been involved in tree plantings in over twenty years. The Paramount Chief, acknowledging that deforestation is a problem in his Chiefdom, wanted to make a law that people could only cut trees for local use only and not to sell. This law was sent to the District Officer a year ago. The Paramount Chief never heard back, and said he would make it a local bylaw soon, but did not give a timeline. Yet, he is concerned that "before we went 50 or 60 yards for firewood, and now we must go 3 or 4 miles away."

In regards to addressing the poverty that leads to deforestation, the Paramount Chief said, "The Paramount Chief can't provide jobs for youths. The government can create avenue for jobs with agricultural machines. We have vast

bole land. Let the government bring tractors and animal husbandry." He also hoped to involve NGOs in reforestation efforts in the future. Interactions between central and local government officials, NGOs, community leaders, and village members are complex and often characterized by a lack of trust, making such partnerships difficult.

These conflicts are not limited to Senehun—one community leader tells a story from 1962 when he lived in a nearby village. "There was a 9 mile stretch of trees planted 10 years earlier [by forestry]. Someone cut them down to start an oil palm plantation. I went to the Section Chief to tell him because I thought he would be furious too. These were our trees! But the chief said, 'I have built my own house so I have no need of trees." I couldn't sleep. The forestry people didn't even protest. Some of the trees were left to rot; they didn't even sell them.'" This story also outlines the importance of establishing clear usage rights for trees after they are planted, which might have prevented such an incident from taking place.

Community members

Community members thus far have not engaged in tree planting efforts. The forest officers, agricultural officer and local leaders all agreed that people won't plant trees unless they are paid to do so, since "an empty bag cannot stand." "The only thing we have in our minds is that we need housing and food," explained one villager, and thus they do not have time to engage in tree planting. The chairman of the Kamajei Farmer's Association offered a Mende saying to illustrate why only fruit and oil palm trees were planted in Senehun: "Mende man doesn't like to plant kpendei[oo] [Afzelia spp], but to plant paw paw." Rather than timber specie that takes 20 to 30 years to mature, Mendes plant papaya, which produces fruit within a few years. It is possible that the provision of fast-growing species that can be used for timber and firewood could overcome this aversion, but these so far have not been used.

The women's development association (WDA) of Senehun expressed a strong desire to engage in tree planting, but did not know how to get seedlings, or how to plant trees. In 2001 they were informed by forestry about tree planting, but according to one WDA member, "...they went and said they'd come back with seedlings and never did so. If forestry came with seedlings and got us organized we would be happy to undertake it [tree planting]." The women requested yemani, baji, and would additionally want to intercrop guava, mango, kola nuts and oil palm in their fields. Their desire for timber species is based on their growing economic value: "Originally we are ignorant and did not know why yemani would be of use. Now that the war is over so many people are coming in with machines (power saws) to cut them." When asked if men would mind women taking the lead on tree planting, one woman replied that, "Some men who are literate and educated accept the reality. Those who are not educated take offense and fear their wives will rise against them." She also pointed to her past experiences trying to get men to stop taking kandi trees from

the women: "If you want to stop people they will give you problem. When we started our gardening work men gave us more problem." Yet, she explained, the men "stopped grumbling" when the women began to bring home income from the garden. Perhaps then the planting of economic trees would not irk men so much, if they believed that benefits would truly be realized in upcoming years. Women also pointed to general constraints on women's development activity: "It is hard to get money for school. We are illiterate, we don't know the available resources...most women did not go to school until the government brought compulsory education. Parents never knew the value of education for women. Women were only trained for marriage...I am happy to see culture adapt [and women's roles to change], but others no."

Additionally, the men's Farmer's Association expressed an interest in tree planting. In July's executive meeting, the Secretary presented a tree-planting proposal which the leadership supported. The chair of the association wrote a letter to the District Forest Officer requesting the provision of seedlings and the founding of a nursery in Senehun. No response had been received at the time of writing. While both men's and women's groups have made steps towards the start of tree planting efforts, their reliance on forestry to obtain seeds and technical assistance may slow down or impede such projects as forestry lacks the resources to provide significant support.

In regards to forest policy, the women recommended stronger regulations that would prohibit the harvesting of wood for sale, similar to what a leader proposed above. One woman recommended, "When the government intervenes they will call all town elders and authorities and announce that they will face penalty jail or fine." Acknowledging the complication of prohibiting an economic activity, another woman also said, "Before we talk about policies we need to talk about how we will get money. We need to look out for job facilities so that policy is not a threat to our livelihood." One man echoed this sentiment, explaining, "If you say we can't cut we will just go from bad to worse. We become thieves, rebels."

Women were also very concerned about deforestation's effect on future life in Senehun: "Cutting all of the sticks is leading to the loss of the bush and what will our children do if there is no bush?...The government needs to give an order so that this will stop." The women also implored on the government to regulate men cutting on their land: "I must reemphasize let the government come to our aid to stop the cutting of "plum teak" [kandi] immediately...They [men] will refuse to pay the fine and the women will not take any step after that. We don't have any other way. We just depend on God. That is why we are crying for government to intervene." Such an intervention would need to also include "training and education so that if there is a policy pertaining to that [tree cutting] we will be able to use it. If we are illiterate it will just go on like that."

Conclusions

Placing this case-study within the framework established in the introduction, it is evident that many of Senehun's deterrents to tree planting fit within the categories of critical factors in the tree planting decision named above. Not all of these factors produced disincentives in Senehun, a conclusion also worth noting.

Income. Poverty is a major deterrent to tree planting as it prevents people from investing in long-term economic activity, and also leads to dependence on fast-income sources such as firewood and timber, especially during the hunger season.

Access to Land. This is not a particularly salient issue for people in Senehun. Their families are typically open to granting leases of any length. Only a few families did not own any land at all. However, people rarely ask for long-term use rights because they do not make long-term investments. Thus the prevalence of short-term land tenure is not in itself a barrier to tree planting, but a manifestation of other barriers.

Security of Land Tenure. Insecure land tenure is not a problem for men, as they tend to hold land papers or have clear authority over land from their families. Women, however, could lose their land in times of divorce and thus have the potential, in the absence of income restrictions, to be more cautious in their long-term investments. They also may have difficulty protecting tree crops once they have matured, which is a major deterrent to planting.

Access to Planting Resources. This is a major issue for people in Senehun, as they repeatedly indicated that they lacked both the physical tools (seedlings, shovels, etc) and technical knowledge to begin planting. Cultural norms regarding the division of income also make it more difficult for women to create projects on their own.

Community Norms and Leadership. Many community members expressed frustration over the poor relationships between local government officials, forestry staff and the village. Community laws in regards to forest exploitation are weak, and because of the poverty people justify breaking them. Forestry Officers and local government officials do not have the resources to lead tree planting efforts and have not pushed others to do so. Sometimes they have also broken the laws that they are supposed to enforce, setting poor examples for the community.

Recommendations

The above text were sent to Senehun and, thanks to the dedicated efforts of Josie Lappia Korvey, reviewed by the community for their comments. The following recommendations were originally formed by the researcher and refined by the community through focus groups, questionnaires or individual interviews.

1. **Community organizations should continue pressuring forest officers and central government officials to play a more active role in supporting their efforts.** People feel that they could eventually support reforestation projects independently, but have yet to establish a culture of tree planting and need help in doing so. One community leader noted, "Tree planting is a novelty to Mende culture. Trees grow wildly and naturally...people do not know the importance of trees, and there is no capital and logistics to start tree planting." People stressed that Forestry should be responsible for educating people about tree planting, but that with this education they could begin to grow their own seedlings and plan their own projects.

2. **Community members could support forest officers so that they can focus more energy on the forests and less on subsistence.** Given that forest officers could play a greater role in tree planting but are too poorly paid to devote their time towards it, people in Senehun could start supporting forest officers as they do school officials and local government officials. This could mean occasional donations of food, assistance in farm activity, or assistance in firewood vending. In a focus group, people said "It is a good idea because it would help to motivate the forestry workers to involve in more tree planting." A community leader noted, however, "It is not so easy. You cannot give what you do not have. At harvest time it may be O.K. But what about the hunger months? More than that—they [forestry workers] are better off in the community than destitute farmers."

3. **The village could form a forest council that would monitor forest activities, so that the burden is not so heavily on local government officials.** This council could work in conjunction with the forest guard to encourage the following of local laws, organize tree plantings, and ensure that no one has privileged access to forest resources. They would also be more accountable to the community than current individual leaders.

Everyone consulted felt this was a good idea. When asked why such a committee was never formed in the past, people said that "Lack of cooperation on the side of the community people" was the cause. It appears, however, that lack of cooperation cannot be blamed on any particular group, but is a general issue in the community.

4. **Explore collective tree planting as a form of risk-sharing, with clearly demarcated conditions for the division of profits.** This could occur using the model of the women's vegetable garden, or be a family investment. People agreed that "It is a good idea to plant collective trees; if other communities around see such development then they too will undertake it, and deforestation will be easily controlled." People said that collective tree farming had not occurred because "people don't know the importance of tree planting, and they do not know the effect of deforestation." Also, one community leader stressed that "They should have something in hand while waiting for the tree harvest," and that food-for-work or other support could be used as an incentive for people to start long-term investments.

5. **Research different methods of creating "firewalls" to reduce the risks inherent in long-term crop production.** People stressed the importance of this, as random fires are a major deterrent to long-term investment. They thought that "strict laws and means to enforce them," was the key, but that "during the war and immediately after the war there was no law and order in the entire country, but now laws are [and can be] maintained in the chiefdom and in the country as a whole." Rather than place full responsibility on the leadership for the enforcement of laws, people noted that "the community should be encouraged to participate and supervise these laws."

6. **A long-term goal should be economic growth that is less dependent on forest resources (growing ginger, processing palm oil, etc.)** One community leader commented that "Planting cash crops can serve to fill the vacuum while waiting for the tree harvest. While harvesting ginger or oil palm, trees can be planted." Already ginger farming is increasing thanks to several boxes of Chinese ginger allocated to the Farmer's Association by the central government.

Ultimately, people concluded that a lack of education and logistical support were the key barriers to tree planting, more than access to land or security of land tenure. This points to a number of institutional and leadership problems which in turn stem from insecurity in the aftermath of the war. There is an extent to which only time will sort out leadership structures and reestablish cooperation within communities, but this case study also illustrates some of the opportunities for the government, NGOs and the community to work more in tandem to encourage tree planting in the present.

Case Study II: Tombo Village, Western Area

Population and Geography

Tombo is a large fishing village in the Western Area of Sierra Leone. It has approximately 15,000 people, 5,000 of whom are native to the region, 10,000 of whom immigrated during the war. The town stretches west of the highway and is approximately ½ mile by 1 mile. On the eastern side of the highway is about 3 miles of private land which extends up into the hills. The forest reserve starts behind the private land and is accessible both by dirt road and bush path. Private land is primarily owned by Tombo natives, but the vast majority of those who use this land for farming or fetching firewood are immigrants, as most native residents of Tombo are fishermen or connected to fishing through the processing and packing of fish products.

Tombo Village

Approx. Pop. – 15,000

Approx. Area - 0.5 x 1mile

Approx. distance to Freetown. - 26 miles

Government Structure

Because Tombo is in the Western Area of Sierra Leone, previously under direct control of the British administration, it does not have a Paramount Chief to administer lands. All land is either held as private property or by the government as reserves. Still the village has a similar administrative structure to Senehun in that a District Chief functions as a Section Chief, and village-level chiefs are referred to as Headmen or Chiefs interchangeably. Tombo is a part of the York Rural District, which is comprised of seven villages: York, Tombo, Goderich, Banana Island, Kent, Sitti, and Hamilton.
Besides from the Headman and his Vice Headman, there is also a council of elders in each village, along with a local court that deliberates local matters. A regional police station in Tombo addresses conflicts deemed too serious for the local court such as murder.

Land Tenure System

Land is transferred from one party to another primarily through kinship. It is rare that land is sold, given that people prefer to lease land a year at the time, or do not have the disposable income required to purchase it. Children receive land from their parents based on the parent's assessment of the child's level of responsibility and devotion to the parents. As one community leader explained, " Sometimes you will donate all to a favorite son or daughter...usually you leave all property with the first male or female child. If she is too disorganized they will change it. Children sometimes compete in taking care of parents before their death...Parents sometimes will give a larger portion to those who care for them

and then smaller portions to the rest. Forty days after the burial the will is disclosed and people have to live with whatever is written."

When land is purchased by a family, it is usually at the instigation of a woman. As the same leader reported, "Women usually convince the men to buy land, since they are most concerned with having a secure homestead. The husband has the capital to buy it. They will put it one or both of their names, or with the kids for security...the main breadwinner has control over final decision in the family...sometimes this means the woman, especially if she is a banda [fish oven] owner." However, families that own land rarely use it themselves, preferring to loan or rent it out to others for farming. Therefore they tend not to make long-term investments on the land, such as trees, as they prefer to have a steady annual income from the land rental, or to gain the social currency of loaning out land for free. Since the war, more and more people have borrowed rather than rent it given the economic hardship.

The War's Effect on Tombo

Tombo was fortunate not to see more than two weeks of fighting in 1998, given that most villages in the Western Area were free from much conflict. Because Tombo was regarded as a safe village, and one with significant economic opportunity because of its fish resources, its population grew substantially throughout the 1990s. As one local leader commented, "The population is too much to deter deforestation," even though people "try to go home." As noted earlier, as many as 10,000 inhabitants of Tombo are immigrants. Some of these people came from villages in the Western rural areas such as York, Waterloo, and Koya. The majority came from Kaffu or Bullom in the Chiefdom of Lungi, as it is also predominantly a fishing community. There are others who came from Bumpeh and Kagboro chiefdom in the Moyamba district. There are people from the Fula, Temne, Sherbro, Mende and Loko tribes (at least). Finally, there are a small number of Ghanaian and Senegalese fishermen who have emigrated. Since immigrants are most often the farmers, firewood cutters and vendors in Senehun, natives tend to blame them for deforestation. This assessment however does not account for the fact that the main consumers of firewood are native to Tombo, who create the opportunities for immigrants to profit from firewood sales.

Despite there being relative peace in Tombo, many systems related to forest management broke down during the war due to a lack of resources and a general climate of uncertainty in the country. The FAO was forced to leave before it could implement the next stage of its firewood plantation project. GTZ's funding ran out for a fishery improvement project from 1980-1989, and the program was discontinued due to changing priorities on the part of GTZ (providing disaster relief). The forestry department had limited resources and stopped providing seedlings. Community leaders, as one headman explained, were not able to continue leading projects. Though community leaders have remained relatively consistent, in contrast to those in Senehun and other areas

which experienced more fighting, the population boom has also made it more difficult for them to organize community activities and enforce community laws. As the final moments of the war were fought in Freetown in 1999/2000, very close to Tombo, the village's fate remained uncertain until recently and thus it has had less time to begin the reconstruction of institutions with some assumption of consistency and permanency.

Economic activities using forest resources

The vast majority of Tombo residents are involved in the catching, processing and vending of fish, but these activities are intimately tied to forest resources through their use of wood. Most fish is smoked and then shipped either to neighboring towns and cities, or exported to Liberia and Guinea. The smoking process requires substantial wood and thus many people, primarily immigrants to Tombo, make their living by cutting and selling firewood. Other occupations include petty trading, farming, carpentry, masonry, etc. Daily income varies from Le 3,000 for a fishing boy to Le 1,000,000 for a boat owner with a good catch that day. Higher incomes tend to be fetched by long-term residents of Tombo, as they have had time to collect the capital necessary to buy a boat.

Farming

There are very few farmers in Tombo, because as one resident explained, "If I farm I have to wait at least 3 months for my crops. If I go fishing today I can feed my family tonight." Approximately 300 farmers grow crops such as rice, groundnuts, cassava, fruits, corn, etc. 90% of farming is done on government land in the forest reserve. In the past this permission was granted for 4,000 Le annually, but since the war this fee has not been collected. As one community leader explained, "since the war the government is trying to promote sustainable food production so that we do not import so much food...they give farmers seeds and other inputs." The other 10% of farming happens on private land, but as most farmers are immigrants, and land owners are natives of Tombo, those who farm on private land also do so with a one-year lease or borrowing arrangement. Farmers practice slash-and-burn agriculture and note the effects of this system on the soil and water supply. However, because they receive permission to farm, they feel justified in burning and selling firewood, and condemn those who cut raw sticks from the forestry reserve.

Farmers who grow on their own private land, as few as 20 people, do occasionally plant trees. They report that these trees are used to make boards, for shade, or for mango, oil palm and citrus harvesting. A group of farmers agreed that trees are planted on two occasions: when trees die out they are replaced, and if farmers have extra space they might try out a new tree crop. Trees are primarily intercropped rather than planted separately as "they think this is the best way of doing things."

Most people, however rarely plant tree crops because they only receive land for a year and thus won't plant longer-term investments. Farmers are encouraged by Forestry to plant trees when they leave an area as part of the popular Tonguyah system previously used in parts of Sierra Leone, but when seedlings are provided, many refuse to plant and there is no penalty leveraged. Farmers report that they are aware they can receive Acacia seedlings for free from the Ministry but do not request them because they will not farm the same plot of land for multiple years and do not see any value to planting. The few who farm on their own private land and therefore could plant trees and reap the economic benefits fear that the government will claim that any land covered with acacias actually is part of the forest reserve and seize it, despite Forestry's insistence that this would never occur.

Firewood production

Approximately 80 men and 300 women are engaged in commercial firewood production, which they supply to fish processors. Wood is sold at Le. 800 for a dozen sticks, though depending on supply and demand this figure can rise to Le. 1,500[12] or fall to Le 500. A wood cutter's income is quite variable given that the fish catch varies widely from day to day.

Most vendors are immigrants to Tombo who do not have other sources of employment. The men cut some wood from private land but primarily wood from the forest reserve since private land has, for the most part, been exhausted. Wood from the forest reserve is both dry and raw, whereas wood from private land has usually been burnt. Firewood producers use axes and other manual instruments rather than power saws.
Some who cut on private land paid Le 5,000/(US$ 2.08) for permission to do so, while others, according to one major property owner, give a small token, beg for permission to cut for free, or cut from private land without any permission.

There are three groups of male woodcutters: two that hire a vehicle to transport the wood, and one other that works with women to transport the wood on their heads. The first group who uses trucks reports traveling as far as 7 miles to cut wood, and that five years ago they went only 3 to 4 miles. This implies that not only is wood less scarce, but that over the years woodcutters have increasingly relied on the government reserve, which was confirmed by them. Typically these men work alone, but occasionally they will hire 1 or 2 men for the day at a cost of Le 5,000.

The second group likes to work in units of 5 or more with the "leader" of the group for that day providing food for the rest. These men go as far as six miles for the wood, and recall that they used to go only 2 miles away five years ago. Hiring a truck to transport the wood back to Tombo costs Le 80,000 per trip.

Finally, those who do not hire a truck report working together in groups as large as ten of men, women and children. They rotate who gets to be the

[12] US$ 0.63

leader of the group, working without pay for 9 days, then getting to keep all the profits on the tenth day. They walk about a mile away from the village, and report that five years ago they only walked approximately 300 yards to get wood. Therefore accounts from all three groups of male woodcutters lead to the conclusion that wood supplies have grown more scare from 1998 to 2003, with no signs of decreased consumption.

Types of wood cut by men include plum tree, yemani, spices tree, balkantha[t], akronko[t] [Terminalia ivorensis], kabamp/Am-bamp[t] [Dialium guineense], kaoath/Ka-yoth[t] [Pentadesma butyracea] and kaeece. Men say "we cut dry wood but sometimes because of scarcity we cut raw wood in order to fill up a trip." They also report that customers "like mangrove the best," and that they do not cut acacias because "...Acacia tree burns quickly. People are not interested in burning them."

There are approximately 300 women who cut and sell firewood in Tombo, though they primarily sell to other women for cooking as opposed to fish processing. Due to their lack of mechanized transport, they harvest a smaller quantity than male vendors. The women walk five to six miles away to gather wood on their heads or with a wheelbarrow, and note that five years ago this distance was only a mile. Types of wood harvested by women include mangrove, "lolum", "fambul[α]" and "plum". They say people prefer to use mangrove and lolum because they are stronger than others, last long in the fire and give attractive colours to fish.

Both men and women report that firewood collection is tiring work and is only a last resort method of getting income. Women report additional problems with sickness as they stay in the woods late and get cold, especially during the rainy season. They also have significant concerns about safety and work in groups as a means of protection.

Though all vendors report that firewood is their main source of income, families tend to have multiple income streams and thus rely on a variety of occupations for their livelihood. Few vendors were able to say how many bundles they sell in a day or a week as it depends greatly on the day's fish catch. This is problematic as it makes it difficult for firewood vendors to plan their spending. Average daily sale for women was 5 bundles, for an income of Le 2,500 to 7,500.

[t] Temne name

Fishing and fish processing

Activities related to fishing are rather strictly divided between men and women in
Tombo. Only men go fishing, often for days at a time. In Tombo there are approximately 80 large boats which carry up to 25 fishermen. Hence around 6,400 men can be out fishing at once, plus more in the small canoes. This would imply that the vast majority of men are engaged in fishing, even if only part-time. It is considered the most lucrative business in town, despite yielding a very volatile income. Most fish caught are herring and can be sold from Le 50 to Le 1000 the dozen depending on scarcity, and other fish, such as cat fish, mackerel and shark, are "very expensive" and less often caught.

There are approximately 200 bandas[13] in Tombo, most of which are both owned and operated by women. These women manage their finances separately from their husbands, so that women who own bandas may even "purchase" raw fish from their own husbands. The women join together in cooperatives and loan money to one household to make the initial capital investment, or ask men in their families for assistance. Each banda has a chairlady or chairman who makes decisions in consultations with the co-op.

The bandas are made out of mud, sticks, iron mesh and iron bars. An improved, wood-saving model also incorporates cement in the bricks but is more expensive to make and rarely used. Just the wire rods for a 10 meter by 2 meter banda cost Le 350,000, plus the cost of the sticks, mesh, cement and labor. One banda 10 meters by 2 meters can smoke 1,200 dozen fish at a time and use 15 bundles of firewood over two days. An improved Banda may use only half as much wood. Lack of proper buildings to house the bandas allows wind to enter the oven and also increases the quantity of wood needed by bandas housed in rice bag shacks.

Given inflation, it is difficult to measure just how much the price of wood has increased, but the women's chairlady reports that wood prices have risen substantially over the past 10 years due to a lack of transportation for the wood, and a shortage of mangrove wood brought by boats. She also reports that the first set of hills used to be covered in trees 10 years ago, but now "you can just see right past it."

Though banda owners will use whatever wood is available, they prefer black tumbla, banda stick, spice, Kondii[∞] [Uapaca guineensis], gbongbo[α] [Daniellia thurifera], mangrove and plum teak[α]. Women would prefer to have icing facilities and sell fish fresh instead, but there is currently no electricity in Tombo to do so. As the chairlady reported, "Before the war people were

[13] local name for fish-drying stoves

engaged in other business but after war they can easily go to the bush to get wood and because of that deforestation is growing. People here would prefer an alternative way of income like the establishment of electricity and a cold room...it will reduce wood use and we could even use hydroelectricity. If this was established we could smoke fish with an electric oven."

Both men and women package fish for export, but primarily women vend it locally. As one woman reported, "Men are very much ashamed to start small scale fish business whilst the women are very proud to do it because they know that they would do well under a very short time." Through fish smoking and vending, women are able to control some of their income and thus can make independent investment decisions from their husbands, though usually "consult them first." In 2003 women bought a dozen fish bought for Le 500 at the beach or for 800 Le after processing, and then could sell them retail for Le 1,000 or more depending on scarcity.

Boat-making

Boat makers typically produce a boat a month, which requires approximately 150, 12 foot boards of white Ronko[α] [Terminalia ivorensis] wood and 30 boards of thicker Yemani, cut by power saw. This wood comes from the provinces, especially the Moyamba district and near Makeni, and can cost Le 500,000 to Le 1 million. The boats are sold for several million Le. Boat makers are all men, though women support the activity by cooking.

Furniture-making

Furniture makers use primarily Yemani from the York district peninsula forest, cut by power saw. The boards they use cost as much as Le 15,000 a piece. Volume of furniture produced is quite variable by both workshop and time period. A bed, for example, costs Le 100,000 to Le 125,000.

Banda Construction

The plum tree is primarily used for the construction of bandas. It is imported from Kagboro and Bumpeh chiefdom in the Moyamba district and also harvested from the forest reserve, though plum trees are reportedly scarce. Prices for the sticks are as follows: Le 5,000 for one large piece, Le 8,000 for a dozen medium pieces and Le 5,000 for a dozen small pieces.

Forest Management: Role and Responsibilities

Department of Forestry

The forest reserve stretches from McDonald to Tokey, an area approximately 25.5 miles long. It is serviced by one Forest Officer, two Forest Rangers, six laborers and two volunteers. They have two Honda bikes for transportation, one which is currently out of use. The rest of the reserve, from Tokey to York, is serviced by one Forest Officer with two elderly Forest Rangers who can no longer patrol long distances. This area of the reserve is patrolled entirely on foot.

Forestry laborers are paid Le 60,000 per month, and the rangers and officers receive Le 70,000 to 80,000 per month. All say that this salary is inadequate and thus they devote significant time to other tasks, such as farming and selling firewood, and often during the same hours they are supposed to be working for forestry. One ranger reports that he works for himself "whenever I feel like it...I have to do something extra each day to make money." Most community members do not fault forestry staff for this: as one headman acknowledged, "if you want someone to do a good job, you have to pay them for it!" All staff have at least 4 years of experience working forestry; some have over thirty.

Forestry workers focus on two projects: patrolling, and maintaining the nursery at John Obey. Laborers keep the John Obey compound clean, dig, fill bags, etc. The officers and rangers focus more on patrolling and supervision. The nursery contains 11,500 government-owned acacias which were planted in March. It also has 13,000 Acacia spp. and several hundred oil palm and cashew trees that the forest ranger stationed at John Obey grows with his son to sell. He said that his trees are tended separately and he does not receive support from forest laborers in their care.

The Acacia spp. are available for free to anyone who wants to plant. They only need to make a request at Tower Hill, the Youyi Building or through the local forestry officers who pass the message along. Most people in Tombo and surrounding villages know that these trees are available but rarely make requests. The nursery is in John Obey, a 10-minute motorbike ride away, and thus may be prohibitively far for significant transfer of seedlings by foot. Some people, such as the firewood cutters, had received seedlings from the ministry before the war, but were not aware that seedlings were still available. Many of the trees had outgrown their seeding bags by July, and unless forestry planted them independent of the communities, they would have gone to waste.

A forest guard who worked for many years in another part of Sierra Leone mentioned that he would like to enforce the Tonguyah farming system in Tombo, but cites a lack of interest. Under Tonguyah, "You go to forestry and ask for land to plant rice. You get a few acres to plant. You brush, burn, plant rice,

corn, cassava. After you plant, but before the harvest, you plant trees since its still in wet season [July-Sept]. Forestry would plant the trees, not the farmers. We did 100 to 200 acres a year." Some seedlings from John Obey also go to a forestry-run plantation in Fabaina, which plants acacia, eucalyptus and Yemani trees. As one forestry official explained, "Government will cut it and it will go to the boss men for personal use and ministry use."

Before the war the government used to give licenses for woodcutting, but legislation has not been reenacted or revised since. Technically the removal of any material from the reserve is illegal, but as there is no penalty for doing so people continue to cut. Most are aware this is illegal but feel they have no other way of making money. Others in the village believe that there is still a licensing or fining system and thus it appears lack of clarity is also a problem. However, some village leaders prefer that licenses are not granted, as this would imply that forest exploitation was acceptable: as one headman noted, "if I have a license I will fell whatever I feel."

When forestry staff encounter woodcutters in the reserve, as many as a dozen a day, they tell them to leave and sometimes report them to the police or the headman. But, because there is no penalty, "once you turn your back they just go right back to cutting" reports one forest officer. The previous headman said he used to levy a Le 10,000 fine on wood cutters caught by forestry; no fine is currently levied by the village. The foresters said they would like to have a licensing system and levy fines, but that if they suggested that to the central administration "they will think we just want the money for ourselves." Forestry workers also mentioned that they would like to have the power to arrest people themselves, a right that actually is afforded to them under the 1989 Forestry Regulations, but forestry workers approached with the document claimed to never have seen it before.

Wood cutters and a forestry volunteer report that a bundle a week is collected from each man as a tax and shared among the forestry staff, volunteers, police and local authorities. The women also report that they pay a bundle of wood a week to the rangers, in addition to Le 500. They believe it is unfair for women to be taxed more than men, but "cannot challenge it because we need the income."

On June 5 forestry led a tree planting exercise in conjunction with the youth leader and elders in honor of National Tree Planting Day. 450 trees were planted out of a total 1,500 expected to be planted in the upcoming weeks. No tree planting occurred during the researcher's stay in Tombo because it was said another site needed to be cleared and prepared. Forestry workers and community members report that this was the first tree planting coordinated by forestry in the last 4 years in Tombo. From 1983 until 1990, forestry gave acacias to farmers to plant on private land, and maintained "a cordial relationship with Tombo," according to one village leader. After that, of villages in the York rural district, only Bungawaf has continuously worked with forestry to plant trees.

Department of Agriculture

Agricultural Instructors do monthly sensitizations for farmers on how to plant, types of soils, agro-forestry, etc, which are attended by 40-50 people. However, they do not directly provide seedlings for people and have not collaborated with Forestry to provide them. A group of farmers reported that "the government helps in plenty of ways such as advice on how to plant, the time, season, types of soil, for most of the trees and the distance that must tree must have from plant to another." Still, greater collaboration between Agriculture and Forestry could ensure that people interested in agro-forestry have the tools necessary to practice it.

NGOs

Among a number of NGOs that have worked in the Tombo area, two in particular addressed issues of deforestation: the Food and Agricultural Organization (FAO) and the Environmental Foundation for Africa (EFA). Tombo was part of the FAOs firewood program in the 1980s. Under this program Acacia mangun, Acacia auriculoformis, eucalyptus and yemani trees were planted. Farmers were encouraged to plant 605 trees for every half acre after the rains but before harvest time, with the help of U.S. Peace Corps volunteers. Farmers received half a bag of rice, four salmon and half a gallon of palm oil for every half acre planted. This program is commonly cited as the reason why people expect to be compensated for planting trees, since the FAO program was quite popular. Still, there were lingering questions about ownership rights to the trees since the FAO was forced to leave during the war. The headman of Tombo from 1983-2000 reported that he was "...never involved in the program. I was aware of it of course. But they never came and asked me to participate." Lack of participation and investment from local people made it difficult for the project to continue without the constant presence of the FAO extension staff.

The Environmental Foundation for Africa included Tombo in its PAGE program in 1999 and 2000. This program included a number of villages in York rural district. EFA came with seeds and trained people in the community to raise seedlings, with the intention of building PAGE's capacity into a self-sufficient Community Based Organization (CBO). Due to funding, EFA reports, they were forced to limit the program to two villages after the first few years, and chose not to include in Tombo. People in Tombo expressed dissatisfaction with the project, and likewise EFA staff felt that Tombo residents were not interested enough in the project to justify running it there. People in two neighboring villages still run nurseries on behalf of EFA: EFA trained people to nurse seedlings, which EFA then buys from the people for use around Sierra Leone.

No other NGOs nor community groups in Tombo are currently addressing deforestation, except for the Tombo Youth Development Organization (TYDO) that spearheaded the June 5 tree planting. In 2002 the TYDO also had a program, in conjunction with forestry, training youths to build mud stoves that

save wood, but this program was terminated. TYDO also mentioned that it is working with community leaders to try and make the Tonguyah farming system a local law with real enforcement.

There are a large number of community organizations in Tombo: of fish vendors, fishermen, youths, fuel sellers, farmers, churches, etc., and these units could be used to encourage further tree planting efforts, and perhaps revive the stove building project. One community leader noted, "They will like to plant without payment because they get many things from planting and they get more money through planting." Another woman reported, "People like to work in group and they are organized to do things together...They are interested in planting tree because they [forestry, NGOs] have learned us that when you cut one tree you plant three more because the tree prevent us from heavy wind and give us shelter." However, these groups have not yet engaged in tree planting despite some mentioning planning efforts for the future.

People often expressed that they would appreciate more assistance from NGOs and the government in planning tree planting projects. As one young man articulated, "As youths we want to make the trees grow back since they were devastated by the war. We need food for work and we need tools. It is our duty to replant these trees and we have volunteered to plant them because we have to take care. The bush has been devastated by people threatened running away and coming in to take the firewood. We are planting these trees [on national tree planting day, June 5]. We are not paid but assisted with seeds to plant. People are illiterate so we need to do a lot of sensitization for the people. If they really knew about the importance of the forest they would do it as volunteers."

Community members

People in Tombo are generally aware of, and concerned about, the dangers of deforestation. They fear the effects of deforestation on soil erosion, water collection, storm damage to property, and the price of fish drying. They also noted that mangrove depletion has resulted in decreased fish spawning. Though, as one woman reported, "people who live closer to the forests are more interested in tree planting than those who live far," all were well-informed of the benefits of trees. As the chairlady reported, "Trees are like children: just as we replace the dead with babies, we need to plant new trees. That's why the government is responding and sentisitizing so that people know to plant a tree for each they chop. As long as seedlings are available people will do that."

Community members present two opposing views of their enthusiasm for tree planting efforts. Most firewood vendors, fishermen and fish processors say they "would be happy and ready to start tree farming if at all we will get the support of the community and the government." They report a willingness to work as volunteers because they recognize the importance of wood to their economy and the rapid rate of deforestation. Several people spoke of plans they will enact to address deforestation, such as planting trees and starting a nursery in town. The fishermen in particular described a plan to ask the elders for a plot

of private land on which to plant trees from the forestry nursery. They will then pay people to harvest the wood for them and use it to dry fish. They expected to begin this plan in January—when asked why this process did not begin earlier, a leader noted, "It is only now we are feeling the pinch of deforestation."

Wood cutters also report that in 1998 they were supplied with seedlings by the Ministry, and did plantings, but that "it has been a long time since we were supplied with such seedlings." They express interest in planting again, if they were supplied with seedlings. Male wood cutters have also approached private property owners about planting acacias. This proposal was not received well since owners feared their land would be taken by the forestry department. Women wood cutters also reported that they believed the government used the acacia trees to demarcate their property. Finally, two young men who worked under the FAOs program and thus have knowledge of how to run a nursery expressed hopes of collecting seeds in March of 2003 in order to start a nursery the following year. They expect that farmers will plant their seedlings as volunteers.

On the other hand, many reported, including the forestry workers that people will not plant unless offered some sort of monetary incentive. Planting trees takes a significant time investment between preparing the land and planting. People are poor and do not have time to contribute voluntary labor. As one forestry official expressed, "Out of all the villages, the least planting happens in Tombo because people don't have too much interest in planting trees. But you can't dry fish without wood. They only care about wood, not trees...Maybe because they don't have money or land and you can't plant trees if you don't have land. It is not easy to plant trees. Most people just cut from the government land.... Some people do have land but I don't know why they don't plant. We do encourage but when you come around them they ask for food to work. People expect food because FAO used to do it. Now if you ask someone to plant they should not be paid for it. They are doing it for themselves...In [a neighboring village} they plant trees even on government land because they don't have their own land and live off of the trees...in Tombo they prefer going far than planting trees. They make more work for themselves -why not just plant around town?"

Some people say that with the proper sensitization more people would be willing to plant trees voluntarily. However, given that there is already a general awareness of the dangers of deforestation in the community, this does not seem to be a strong barrier to greater community involvement in planting efforts. The problem seems to be more about coordination and incentives.

Most community members felt that local leaders such as the headman, elders and counselors should take the lead and that more power should be given to the local level in the creation of policy. Very few believed that forestry should be solely responsible for forest conservation, though most recognized their potential to more actively promote sustainable forest management. One village

leader noted, "The main factor is that someone needs to organize the people...and forestry should do it."

Conclusions

It is difficult to reconcile why people do not plant trees in Tombo, given that they recognize a need for it and have access to free seedlings in a relatively close government nursery. Many are walking many miles a day just to get enough money for one meal in the evening for their families, whereas if they planted an acre of trees closer to the village they would not only earn more money once the trees matured, but have much more free time to engage in other economic activities. There are several reasons why this disconnect may be occurring.

Income. Poverty is an important factor because most vendors, especially women, do not have any savings as they must spend the Le 2,000-3,500 they earn each day on food immediately. Therefore it is difficult for such subsistence vendors to consider taking time out of their wood harvesting activities to plant and maintain trees. Therefore even though some people fault the food for work programs of the FAO for making people associate tree planting with pay, such programs may be necessary so that subsistence vendors have something to eat for at least the day of planting.

Access to Land. There is very little private land available given the proximity of the forest reserve, and most land is owned by long-term residents who fish rather than farm. Farmers are mainly immigrants and rarely secure tenure for more than a year at a time. They also tend to be poorer and thus lack the resources to make a long-term investment.

Security of Land Tenure. Many landowners feared that if they planted acacia trees on their land, the government would claim it as theirs. Both local and central government officials were surprised to hear this, and regardless of whether or not it is true, it is a real fear and must be addressed.

Access to Planting Resources. This was not a major constraint for the people of Tombo, as the nearby nursery had several thousand seedlings ready for planting. A ceremonial tree planting was held in June of 2003 as part of National Tree planting Day, showing that the community is able to organize and plant when given adequate support. Transporting seedlings from the nursery to Tombo, however, would require a vehicle and thus the support of the government or an NGO since there are few privately owned vehicles.

Community Norms and Leadership. The community expanded significantly during the war which has placed a strain on traditional authority structures. There are numerous leaders who could have a role in forestry policy, but they do not communicate and expect somebody else to take responsibility for forest management. Clearly delineating roles and responsibilities for various officials and community members would help ensure that forest management is a planned process.

Recommendations

The following recommendations were offered by various community members through interviews and focus groups.

1. **Implement a system of licenses and fines.** One forest ranger proposed a system with "a heavy fine and heavy punishment because forestry is our life...it is not something we can play with." He would not allow forest resources to be removed for any reason, and levy a Le 250,000/(US$ 105) fine or 3 to 4 months in jail for anyone violating the law. The headman from a nearby village imagined a system in which woodcutters would pay

Le 50,000 annually for a license, and then would have to pay Le 15,000 for each cord of wood cut before being allowed to leave the reserve. Violation of this permitting system would result in the payment of a fine.

Given forestry's limited staffing, this would be a difficult system to enforce, although forestry has been relatively successful at collecting an informal tax from vendors. An easier system might be to jointly tax firewood vendors and fish processors for the use of wood at the place of purchase, as the firewood market is a clearly demarcated area. Even though firewood vending deals could take place out of the market, bandas are not mobile and thus would be easy to patrol. This tax, however, would have to clearly be used for reforestation efforts, or would be heavily resisted by the community.

2. **Restrict woodcutters' movement within the forest reserve.** A former employee of the FAO project recommended implementing a bush fallow system, in which certain areas would be demarcated for cutting and others left fallow for a number of years. Also, a woodcutter recommended allowing people to cut from flat land but not the hills, so that water catchments will not be disturbed.

3. **Improve the conditions of forestry workers.** Forestry workers report that without proper means of transportation, such as a truck capable of confiscating wood, adequate housing and salaries, they are unable to do their jobs properly. People from the village also expressed concern that forestry workers were underpaid, and grossly understaffed given the size of the forest reserve and large number of woodcutters. Given that the central forestry office is under-funded, and its bureaucracy complex, it may be easier for villagers to subsidize forestry officers directly through occasional donations of cash or in kind, or potentially with a percentage of the reforestation tax levied on firewood producers and consumers. This already occurs through informal tax collection which is resented by the community: making this an open transaction might reduce such hostility.

4. **Give greater local control over the forest reserves and forest policy.** People said that this would solve problems of understaffing and lack of trust between forestry and the community, and additionally, that the local community should be responsible for the protection of the forests since they are so directly affected by it. The headman of a nearby village envisioned the creation of a local committee which would collaborate with forestry in the administration of the reserve. Given the size of Tombo, however, and the value of the forest, it would be difficult for committee members to remain accountable to the community which could invite conflict. Hence the headman who proposed the formation of such committee imagined it having numerous measures to promote transparency, such as a ticket and receipt system for licenses. He envisioned it including forestry officials, the seven headmen from the York district, along with seven women representatives "because the president says there has to be gender balance."The duties of the committee would be to, "Advocate for people to plant...and work on a tree farm and advertise for people to come harvest them. We would get an audit from the ministry each month and have all the villages come together."

5. **Establish a tree farm for firewood.** While many villagers including fishermen, banda operators, youth groups, etc., expressed interest in establishing a tree farm no clear time frame has been created for it. There are also significant concerns over who will provide the land and labor, and who will ultimately have the rights to the trees. Potentially, tax money collected from firewood producers/consumers could be used to fund such a tree farm. Producers would gain since they would have more time to devote to activities, and consumers would gain from having cheaper firewood. Groups could ask the elders for longer land tenure, and perhaps pay a rotating member to stand guard at the site and perform maintenance.

6. **Explore different species of trees to plant.** Many consumers of firewood voiced their concern over the acacia's quick burning time. While research done by GTZ in the 1980's showed that acacias performed equally well as other species in the bandas, there is significant local bias against acacias and thus it might be more efficient to plant local preferred species, or at least to intercrop these with acacias so that trees with different growing speeds can fulfill short and long-term needs. For example, white ronko, plum and yemani trees could be planted so that such wood would not need to be brought in for boat, furniture and banda construction. This would bring down the cost of such items, and perhaps enable some women to invest in improved banda designs.

7. **Facilitate greater communication between forestry, agriculture and local leaders through regular meetings.** This would help with community trust, and resolve small bottlenecks such as the fact that agriculture workers encourage alley-cropping but do not have direct access to forestry's seedlings. One local leader reports having voiced his concerns about forest management "plenty of times" to local forestry officials, but acknowledges that forestry staff on the ground have little control over forestry laws and resources. He noted that in April the Ministry of Agriculture came with a questionnaire asking for contributions for the year's action plan. The headman wrote his ideas and never heard back from forestry, and is therefore unsure if his ideas have been heard. Therefore he believes a forestry committee must include people on all levels of the management chain, so that those with decision-making power are included in conversations.

8. **Explore new forms of fish processing.** This may be difficult without the help of an NGO or the government, but greater use of improved bandas or ice-based fish processing could reduce the local fish processing impact on forest. However, it is important to note that increased use of electricity would increase Sierra Leone's trade deficit in petroleum, and thus reducing wood use may be a more viable option in the short-term.

9. **Clarify who should ultimately be responsible for forest management.** Community members, local government officials and forestry officials tend to look to each other for leadership. When this leadership emerges results can be substantial, but otherwise efforts are difficult to sustain. It is interesting to compare the experience of Tombo with that of Bungawaf, a nearby village. In the 1980's Tombo received food for work from the FAO to engage in tree planting, and in the early 1990's Bungawaf received food-for-work as well from Plan International. Once the FAO left, tree planting in Tombo virtually halted. In Bungawaf, however, the headman sustained programming by forming a tree planting committee of five local headmen (in Kent, Bureh Town, Bungawaf, Mama Beach and Pilobide). In 2001 this committee wrote to the Ministry of Agriculture to receive 4,000 seedlings, which were delivered in a truck by forestry. People planted them as volunteers on private and government land, depending on each village's structure. According to the headman of Bungawaf, "There was no strong protest really but the people were still grumbling why me? But as headman I made them do it... when I took a strong stance, I got a good result...there is no written law that you have to plant a tree when you cut one, but people know they must do it" Tree plantings have continued every year since, with 8,000 seedlings planted in 2002 and efforts beginning for 2003.

The headman of Bungawaf points to three reasons why Tombo and Bungawaf diverged paths: people in Bungawaf are often farmers with little land so depend greatly on the health of the government forest reserve, Bungawaf is a small village, and thus the headman can exert more influence, and finally, his leadership has sustained tree planting efforts. Given that life is very fragile in Sierra Leone, it is risky for tree planting to rely on one person's efforts. Therefore it is important that there is an institution or committee responsible and not just an individual. Finally, given that Tombo is very large, perhaps several tree farms could be started simultaneously so that multiple residents feel invested in forest management.

10. **Relax the boundaries of the forest reserve so that people will not be criminalized for encroaching**. Perhaps the portion of forestry land already being farmed could be given joint-ownership designation so that forestry and the farming community could work together to balance the welfare needs of the forest and the farmers. These recommendations address the three main problems of rapid deforestation, poverty and leadership. Most of them require institutional change, i.e. the creation of structural incentives to tree planting, along with calls for individual action. The final case study, Rorainka-Malkia, will illustrate how when structural incentives are in place, even the problem of scarce resources can be overcome and thus is less crucial than the creation of a tree-planting culture.

Case Study III: Rorainka-Malkia Village, Northern Province

Population and Geography

Rorainka-Malkia (more commonly referred to as simply "Rorainka") is a small village in the Makari Gbanti Chiefdom, fifteen miles from Makeni in the Northern Province. It has an approximately two-mile radius, and which is considered to be ample land for roughly 300 residents who reside in 23 compounds of one to three homes. Land is categorized by swamp land, boliland and upland forest. All of these can be used to farm, though the swamp and boliland, given their proximity to the village, are most often used. Rorainka and Malkia were two separate villages, but when the paved road was built they moved to surround it and began to function as one village, despite maintaining separate headmen.

Rorainka-Malkia

Chiefdom:
Makari Gbanti

Households: 23

Approx. Pop. – 300

Dist. from Makeni:
15Miles

Government Structure

Rorainka-Malkia's government structure is similar to that of Senehun, and of other villages in the Northern Province. The Paramount Chief and Chiefdom Speaker of the Makari Gbanti Chiefdom reside in Makeni. There are two headmen (also referred to as chiefs) who reside in Rorainka-Malkia, one who is the headman of Rorainka on the western side of the north-south highway, and one who is the headman of Malkia on the eastern side. Both have vice-chiefs who work with them. The headmen consider themselves to be "liaisons between the people and the government." They enforce laws dictated by the Paramount Chief, and also have the authority to make local by-laws in consultation with the council of elders. The council of elders is made of seven men, though seven women "were ceremonially crowed elders so that they can participate too," explained one community leader.

Local laws are extensive, with provisions addressing the use of threatening language, stealing, adultery, etc. As one headman explained, " There are constant meetings with all the people...we show them new laws and amend them...both men and women vote; it is not refused to anyone." The chiefs in 2003 were both male, and inherited the position from their fathers before the war.

Community taxes are primarily collected on a "user-pays" basis, because all resources are considered to be community-owned. When people want to build a house, they must meet with the elders and pay them a token. If they farm on community land, they pay them one bushel of rice "to show the land does not belong to them," explained one elder. Natives of Rorainka that make charcoal on

community land must give two bags of charcoal per burn, and outsiders who want to do so must pay a token for permission to do so, then pay 4 additional bags after the burn.

Land Tenure System

Land ownership is held in a combination of private and communal tenure. Almost all land is under community ownership, though people may ask the elders for permission to lease land for ten years. This land is then referred to as private even though it will revert back to community ownership. Tenure, however, can be extended if someone plants palm oil, citrus, mango, or other cash-crop trees. Most community land is near the village and the savanna and swamp lands, which are preferred for rice-farming. Hence, most people, despite owning their own bush land, prefer to lease community land for their farms. Groups can also lease land: the Women's Wing of the Rorainka Farmer's Association chose to borrow community land for their communal garden, rather than use private land, in order to use land closer to the village.

Land on which houses are built, along with some farm land further from the village, is held by families on a more permanent basis. This land is passed through inheritance to both men and women, because as one man explained, " ...there is no division between men and women. We are all equal. " All 27 women interviewed said they held land separately from their husbands, acquired through inheritance. One woman said, "When you have a daughter, in your old age you cut a portion [of your land] and say this particular portion belongs to my daughter. When she is married her husband oversees it. At time of planting season men and women sit together and make a plan to do work. They come together and decide which seed to plant." Daughters receive less land, however, than sons, because it is assumed that a married woman will be able to live off of her husband's land. Though not explicitly mentioned, it is possible that less land is also given to daughters because in instances of separation or divorce women can lose their land, whereas men do not.

There are several community laws regarding the use of land, both private and communal. The following four were explained during a focus group of community leaders:

1. Regarding fires: "If you leave a fire and it burns someone's property you must replace it. "
2. Regarding land use: "If a stranger wants to farm here, he must meet the elders and the owners and make a token before, then after the harvest, he must give them some rice."
3. Regarding property rights: "If you stole someone's plants, the law takes care of you."
4. Regarding work ethic: "Citizen or stranger, you must do work to show you are a serious person. Otherwise the community will fight against you and tell you to leave because if you are idle you will steal."

Because Rorainka has relatively few inhabitants, it is very difficult for anyone to move in secret. Neither women nor men report that they have problems with people taking wood or other items from their property, because as one woman explained, "people follow the community laws...we have no problem with that." Another woman added, "people respect the land rights... they do not take trees from women."

The War's Effect on Rorainka

Rorainka was heavily affected by the war given its proximity to Makeni, which was a major headquarters for the RUF. The rebels came through Rorainka in 1997 and stayed in the area until 1999. Almost all Rorainka residents hid in the bush for at least a year, and some people were taken by the rebels to serve as soldiers, bush wives, or were killed. 12 of the 35 existing houses were burned to the ground, leaving the remaining 23 today and leading to severe overcrowding. (Since then adjacent rooms have been added to houses as temporary shelter). All the livestock were destroyed, including sheep, goats and chickens. Economic activities shifted greatly after the war, as people returned and had to restart their lives with the little that the rebels didn't destroy.

Before the war everyone farmed rice, cassava, etc., primarily for subsistence. There were also mango and guava plantations. These crops, along with most farm tools, were destroyed by fire during rebel attack. All the seed rice was either eaten or seized by the rebels. Lacking materials to reengage in farming, after the war many families switched to charcoal production. As one man explained, "Before the war we were planting seed rice on vast land due to machines [tractors] that the Ministry of Agriculture sent. After the war we came back to farm but up to now we look out for the machines, and they haven't come. A man working with hoe exhausts. I see people cutting charcoal, getting money and I jumped into charcoal...charcoal is harder than rice production...if I can still get machines I would like to give up charcoal."

Economic activities using forest resources

Almost all households engage in charcoal production for cash income, along with farming for subsistence. There is no marketplace in Rorainka. People sell vegetables, bread or other products out of their houses, and charcoal is sold by the roadside to passing trucks.

Farming

Most families maintain a small plot of 1 to 5 acres, intercropping rice, cassava and vegetables. This is used for subsistence, though women occasionally will maintain separate vegetable plots and sell the harvest. As noted above, farming in the past was done with the aid of tractors, but since the war people have been forced to clear land through burns or by hand. Though some acknowledge that bush land further away from the village is more fertile, they prefer to plant swamp rice or

clear savannah grass as the variety of grass that grows here is not as vicious as that in Senehun and can be cleared more easily. Still, the women's development leader reflected that much of the bush land close to the village has converted to grasses in just this past decade, which may be a cause for concern as people begin to rely more heavily on charcoal production. People were unclear as to whether the cause of this conversion was the burning of charcoal or the burning of areas by the rebels. However, the relative infrequency of slash-and-burn agriculture in the bush means that forest land is not heavily threatened by agriculture.

Charcoal production

As noted above, charcoal production did not begin in Rorainka until after the war,
and in fact was not even introduced to the North of Sierra Leone until 1980 when an immigrant from Guinea first came to the Port Loko District and taught others to make it. Another man came to Rorainka in 2000 and asked to use land to produce charcoal, setting an example for the village. As one current charcoal producer explained, "we admired how he made money, so he taught some of us, and we taught the rest." As people began to switch from farming to charcoal production, people began to note that the bush land was beginning to deplete faster, intensifying the need for greater reforestation efforts.

Producing charcoal is a two-week long, complicated affair. Most men will produce two batches a month in the dry season, but it also depends on the timing of the farm harvest. Charcoal production is best described in stages:

Stage 1: *Preparing the site. People use hoes to clear the site for the "oven." They try to find soft land with an ample mud supply, as mud is essential later in the process. People also try to find sites with thai (Pterocarpus erinaceus), nanka (Lophira lanceolata), tink/A-tint-a-ro-lal (Syzygium guineense), kabanth (Vitex doniana), and kabeece trees nearby as these are preferred species for charcoal production. There was significant debate among 30 charcoal producers assembled over whether or not acacia trees could serve for charcoal production. No one had tried using them yet. People either believed that acacia trees were more important for other uses such as building houses, or that they would do poorly given their quick burning times. Attitudes were similar regarding the use of yemani trees, though these are more scarce given that planting efforts in the past focused on acacias.*

Stage 2: *Building "the machine." The machine is the center of the charcoal oven. There are two types of machines: the "square hole machine" is made up of 4 sticks piled to create a box, and the "double sticks machine" has three piles of three sticks which criss-cross. Sticks are placed in a circle around it to create an empty cylinder two feet tall, with a small opening approximately 4 by 6 inches. Charcoal is placed in this cylinder and is later lit to start the machine. These initial sticks are also used to elevate larger logs off of the ground, which is considered necessary for effective burning.*

Stage 3: *Piling the wood. Wood cut from the area is stacked to create a half-globe as high as 10 feet, with a diameter of 10 to 15 feet. Large logs are placed on the bottom, with smaller sticks, called "lat," placed on top to encourage an equal distribution of heat. Lat is often gathered by the women, with larger logs gathered and arranged by men. Labor was hired for this stage of the process by ten out of thirty-one men participating in a focus group. One man may employ 10 to 20 men to cut wood for a day, and will pay them 2,000 Le in addition to a meal. 6 or 7 men will then gather the wood for a day, and two men can stack it in a day. Depending on the number of laborers hired, an oven can produce forty to one hundred bags of charcoal, with fifty being most typical.*

Stage 4: *The burning. A six-inch grass and mud layer is applied in order to ensure a slow burning: five to six days is optimal, though by opening holes in the layer at the bottom it is possible to create lower-quality coal within two days. The machine is lit by dropping a lit branch down the vent. The top of the machine is "locked" after the first hour of burning with pieces of wood and dried leaves, maintaining an air column all the way to the top of the wood pile. During the burning period, men, or occasionally women, check on their ovens as much as every hour to ensure the health of the mud cover. If smoke is coming out of the top third of the oven, or if the smoke is green rather than white, the burn will be too fast and more mud is necessary. This period is the most taxing as it requires attention both day and night.*

Stage 5: *Collection and vending. Both men and women participate in the raking of the oven to break apart the coal. The outer bark is removed. During the wet season, people may use a tarpaulin to cover the coal as it will spoil with 2 to 3 days of rain. High quality coal is that which is large and hard, as these pieces last longer when cooking. Large and small pieces are mixed together in 50 kg rice bags, then sealed with a layer of palm fronds. These bags are brought back to the owner's home, and then typically a woman in the family will vend the coal to trucks passing by as she is more likely to be home during the daytime. Though the money goes into the woman's hands, men and women consult to determine how it is spent. As one man explained, "when a woman gets money, she go and ask her husband how to spend it. If man gets it, he asks her for advice before he spends it. Always, they decide together what to spend it on."*

Other men choose to transport the coal on public transportation and sell it themselves in order to get a higher profit; however, in a small family this may reduce their ability to produce more coal and thus prove uneconomical. It costs Le 500 to transport a bag of coal to nearby Makeni, where the going price was Le 3,000 /bag. Most sell in Freetown instead, since even though transporting costs 1,000 Le/bag, charcoal fetches Le 4,500 /bag. The coal is sold wholesale, primarily to women, who vend it retail in small bags (approx. 1000g) for Le 500.

Local Wood Use

Most houses are made out of wood and mud, and while some timber is harvested for construction it is minimal and never sold commercially. Firewood is also typically gathered by each family for personal use. It is taken from the community land. Most people say it is gathered relatively nearby, though some report "we must go 1.5 miles away because now people are using the trees for charcoal more." Families rarely use coal in the home as it is more valuable to sell, but sometimes they will use scraps from the wood-gathering process for firewood. Women prefer thai and nanka trees because they last longer in the fire, and rarely use acacia trees. They do not perceive any scarcity in firewood, though note that during the rainy season they must go further in order to find dry wood.

Forest Management: Role and Responsibilities

Central Government

Neither forestry officers nor agricultural officers are stationed in Rorainka, though there are both stationed in nearby Makeni. Before the war Agriculture used to provide tractors and occasional seeds, and Forestry provided some seedlings. Since the war, however, people report that neither has made any contact with the village, and people say only the community can be responsible for the forests. There is no forest reserve in the area, only community land, and people take the idea of community ownership very seriously.

Community leaders

Given that Rorainka is a small community, the words of leaders such as the headmen, priest, Imam and council of elders are well respected. The leaders are concerned about the health of the forests, and are very effective in both creating and enforcing forest management principles. A meeting with such leaders led to a discussion of the following four laws regarding tree use in the village:

1. While using community land for any purpose, "do not cut young trees".
2. When burning land, do not put fire to the stump of a tree "because it will not grow back," a practice referred to as coppicing.
3. Do not take fruit from community land without permission (this prevents fruit from being picked before it is ripe).
4. "Take permission of the elders before cutting trees, and do not enter violently."

Both before and after the war, community leaders have organized tree plantings in conjunction with the Rorainka Farmer's Association. Before the war they received Acacia and yemani seedlings from Forestry, and also collected and scattered thai and nanka seeds. One leader explained how these tree plantings came about: "In 1985-1988 an NGO came that organized plantings, and the chief continued it. Children got training and taught their parents to plant teak (Tectona grandis) (seedlings). The chief got people to come. Anything they do,

they call the town crier. People gather. He tells them tomorrow each and everyone should plant trees...in a community you have good and bad, but you encourage everyone and they accept." Every June people would gather for one or two days and plant on community land, with food-for-work provided by the headmen and their families. Men and women have well-defined tasks within the tree planting process. One headman explained, "Women have the greater role because they transport trees, water, cook the food...men just do the planting."

Trees were planted because, as one elder explained, "We do reforestation because we need to plant back what's been cut down... we don't want trees to finish so we are replacing them, because we see their benefits... It is for us and also for the children. With these [Acacia] trees we are building houses and making medicine." People have to ask the chiefs for permission to cut trees, but can do so without any cost. Taking permission, as one leader explained, is "as a respect, you have to respect the chiefs." The Acacia, and especially yemani, are occasionally used for housing, but these trees are more often perceived as, as one man explained, "a reserve for if the other [native] trees run out." One man expressed a desire for power saws, saying that they would "use power saw on natural trees, than on the improved variety [Acacia] while the natural trees germinate again."

Tree planting continued after the war, though its structure changed. Forestry stopped providing seedlings, so people learned to uproot seedlings from the old planting area and transplant them to other sites. Chiefs could no longer provide food-for-work for everyone, since the rebels destroyed people's farms. As one chief explained, "In those days I had food so all came and got to eat, and everyone was eager to go do the work. But with the rebels, there is no food on the farm and I cannot help." Still, people believed that tree planting was important enough for the community, that they all contributed some food for the last two years of tree planting. Local leaders are committed to continuing tree plantings, though would like to re-invite the participation of the forestry department in their efforts. As one headman explained," If [central] government doesn't help we can still plant as long as peace prevails. If government helps of course we can do more...we elders want to renew the forest, but we need help."

In December of 2002, an uncontrolled fire destroyed the Acacia plot and thus in 2003 no planting was done since all the seedlings were burned before they could be transplanted. Leaders say they want to spend the remainder of 2003 reinstituting the training of youths in forestry, so that they can start a local nursery and continue reforestation efforts in future years.

Even without focused reforestation efforts, leaders were confident that trees would reproduce sufficiently. As one explained, "The people are going and cutting community land in vast area. Because of replacement we expect no scarcity. Charcoal production doesn't need a large quantity of trees—10 trees can make 20 bags. We have millions of trees in our 15 mile radius. The nanka and thai

trees scatter on their own...when you chop one down, it will grow back within six years anyway."

Community members

People in the community were highly aware of the value of tree planting, and were proud of their previous efforts. As one man explained, "We plant in order to replace cut trees....this land belongs to the community and we see it wise to form association and share the work." They were quite knowledgeable about the different types of trees in the area and how to best maintain their tree stock. For example, one charcoal producer explained, "It is hard to plant thai seed because we would have to uproot it and transplant. The natural replacement time for a thai or nanka is 6 years, then we can cut it again. If you burn the tree it kills it, but if you fell it the tree germinates again."

Education efforts have been led by a few key community members who organized a research and training team. One of these leaders explained the process by which they began to organize. "Before the war, five people made research. We sat together and say lets go there and know about this tree planting. We went to training schools in Makama and Makeni [towns], or went to Njala [agricultural university]. We got books pertaining to afforestation and tree plantings, and out of reading we get our research. We come and sit together and compile our research orally, we sensitize illiterates, and show them how to do the job along with support from agriculture and forestry. Ten boys were [undergoing] training under us— they know how to nurse, use local fertilizer [mud from charcoal ovens]... we set up who will be responsible for all things possible for tree planting. There is a set of people who understand the job."

One trainee gave a positive account of his experience in the program. He decided to participate when he was 15 because "I thought it wise...the community land is a collective responsibility...mature trees are good for houses, you can cut sticks for charcoal, and then they are closer [to the village]...I just decided this work is nice. I saw benefit in the training and the output of trees." The training ran from Monday to Friday for three hours in the morning, "so that we can have the afternoon to do our own work." The training program should have been five years long, but was interrupted by the war during the third year.

Skills he received include the ability to nurse seedlings, transplant trees and start a plantation. With his training he started an Acacia plantation on family land with the help of his brother, from 1994 to 1996. He chose to plant Acacias because "we can get no other improved [foreign] variety unless we wait for government to give seedlings." He was also hired to plant trees in a neighboring village three times from 1995 to 1997, which might have continued but he went to Freetown from 1997 to 2001 for security during the war. Since returning he has not planted "because of hardship...I am supporting my family and the only income is charcoal production." He uses community land to make charcoal rather than his plantation because "my plantation with the improved variety is a reserve...there are still more trees in the wild plantation so I can save mine."

He is still interested in planting, but says he will need government support in order to do so. "If I have logistics I will continue to plant: I need bags, shovel, wheelbarrow for soil, a hand fork. The Minister of Agriculture gave us tools during our training, but rebels took them. Our local tools aren't as good and our local bags break."

Only boys were trained, he explains, because, "The girls were not interested when we started. At the beginning they thought that the job was jobless [would not fetch income]...but in time they saw the boys doing well...girls started to come and meet them and ask about it. Ten came and asked me, and I taught them some small thing." One of the trainers echoes, "Girls were not interested in agriculture. Now girls come and ask to be put on the list to learn—when we restart the training, we will have five new girls, and the same ten boys will continue." It is unclear when training will begin, though this leader was hoping to do so in January of 2004.

NGOs

Rorainka has had little contact with NGOs. Plan International built a health center in 1975, and Child in Need Ministry gave rice seeds and food-for-work to people when they returned from the war in 1998/1999. The FAO was also engaged with surrounding villages at this time, but not with Rorainka directly. Since 1999, only Forum of Conscience (FOC) has been active in Rorainka. This NGO gives women's groups tape recorders and asks them to make requests to the NGO community, to build a secondary school, for example, or provide seedlings. It then broadcasts the tapes from a radio station in Makeni. While the Women's Development Association has continued the program, they report that so far none of their requests have been fulfilled.

Community-Based Organizations

Several strong community based organizations have complimented the work of village leaders in organizing people for development projects, including tree plantings. Women's groups are the most numerous and most active, a development that men in Rorainka have responded to positively. One man noted, "We have women's groups because there is gender equality here." When asked to clarify what he meant, he said that, "A female has a right to her husband. She is productive. Women and men play a role in the house. At first in marriage man has total right over women. After getting information from the media and NGO workshops we know now that woman has right and man has right. Woman can do what she wants as long as it's the correct thing...when woman gets money from the women's farm it doesn't mean that it [the money] belongs to man, she asks him what to do with it just to give respect and get advice. The development is for both of them." The women's development leader explains that women prefer to organize separately from the men because, "Women, through constant meeting, saw that as a separate body we are better off. Men have stronger work to do for development. Women can join with their

little manual power and do different things than men. If we need men, we can call them." Most organizations are centered on a money-making venture; though differ in their ways of choosing projects and dividing profits.

Women's Development Association (WDA)

The WDA is a large and well-respected organization, comprised of over 120 women from five different towns. It was founded in 2000 with 44 women from Rorainka, and in July 2003 there were 61 members. The WDA was founded as an alternative for women involved in the Women's Wing of the Rorainka Farmer's Association, founded in 1989. The Women's Wing engages in collective farming, then divides the profits equally among all members. The WDA also has a collective farm, but members decide as a group how to spend the money. As its leader explained, "We don't have help from NGO or the government, so we must think for ourselves, what can we do with our own money for development? We come together and we say, this money is for agriculture, this is for seedlings, this is for food for work."

The primarily concern of the WDA is not agriculture, but education. Their focus on agricultural comes from a need to raise money in order to pursue their educational goals for their children and selves. As one woman explained, " We are stressing this farming because we want financial support for our children—education can't stop at the primary level so we must plan long term to get our children to secondary school...we meet three times a month, and a secondary school is always at the top of the agenda." There is a primary school nearby, but the closest secondary school is 15 miles away in Makeni and thus funds are necessary not only for school fees, but for living expenses. Even the ten-minute walk to the primary school is considered to be prohibitively far for some children, since as one woman explained, "we cannot all afford umbrellas...if the school were closer, we could force the children to go."

Women were also concerned that girls are not able to go to school as often as boys, since they "drop out and marry" or "get pregnant during school time." This fact was reflected in data from the local school, which reported that in class 1, there were 35 girls out of 63 students, but by class 6 all 13 students were male. The dropout rate for males is also extremely high, but even more so for girls. One woman said, "Our parents didn't give priority to education for girls...only our brothers went to school. Now we send our daughters to school...education is good so we fight hard so that all our children go to school."

Women were also concerned that their own lack of formal education was a barrier to further development efforts. Only five of twenty-seven women participating in a focus group had gone to primary school, and none had learned to neither read nor write in English, Krio or Temne. None could speak English, though all spoke Krio, Temne or another tribal language. As one woman explained, "Education is the most lacking thing. We have no capability of writing. If we can get educated women, we can sit and write proposals [apply for grants] and go much further." The women decided in July 2003 to try and obtain a male

secretary to take notes at their meetings, and were prepared to pay him if necessary.

The women have collectively farmed rice and various intercropped vegetables such as cassava leaf and pepper. As one woman explained, "We are stressing on farming because with large rice we will have extra and sell it, and leave the balance for consumption. Then we can get money to repair and rebuild, and money for school."
Because many tools and seeds were destroyed during the war, initial profits have gone towards "rebuilding" rather than new projects such as the building of the school. For example, the WDA gives two bags of seeds rice to members each year, and then they must give back three at the end of the harvest so that the association can loan more each subsequent year. The women hope for the return of the tractors, and for greater support from NGOs through their connection with Forum of Consciousness. Used to working alone, however, the WDA was not discouraged by their lack of external support. The leader noted, "Without help we will do our best. Still, help will push us more."

The WDA has been an active participant in tree planting efforts, and its members are very interested in embarking on its own projects as both a way of fundraising and supporting reforestation. Before the war, all members were involved in the community's tree plantings, and learned how to uproot and transplant Acacia trees successfully. In 2001 and 2002, the WDA planted 250 trees in conjunction with the Rorainka Farmer's Association. In 2003 no tree planting took place, because, "with the farming problem this year there was not enough food or money, so we kept our attention on food...we are hoping next June to plant."

Despite not planting this year, the women are actively planning to start their own larger scale plantation next year. As the leader explained, "We thought it wise earlier but lacked seedlings." The women want to plant because, as one woman explained, "It is the collective responsibility of women to take care of the forest. We have this responsibility same as men because we also look and protect." They want to plant Acacias because they "are fit for roofing and are easy to use for firewood: if you cut one today, it will be dry to use [the same day]...the wild plantation is bad for roofing." The women also hope that Acacias will prove profitable: "When the trees are ready we can pass a law, if you need a tree come and decide with us what the price will be. We in this organization are trying to create funds. When we have excess money we can start business. We will use the profits for micro-credit." In 2001, the women asked the elders for a plot of land in order to start such a plantation, and were granted permanent rights to a plot, stressing the importance of having a separate women's plantation because "we don't want to leave it to the men because it is difficult to come together and plant."

So far they have not started the plantation because "with competition to get food and resettling it is too much...because of hunger we have no strength for work on a plantation or for our rice. But now we have organized, we just lack

of seeds and other materials...before the war we had seeds but seeds were spoilt during the war; now there is nowhere to get the seedlings. If we can get help at all we will go forward." When asked what type of help they wanted, the women said they need "white-made tools like a pickax and shovel because they are stronger—a hoe can't cut a big stump...after trees are mature they will need supervision and we need advice from the government...government should provide tools to protect plantation and clear the land." The women's leader also noted that they had requested seeds and tools through Forum of Conscience without any response. One youth in the community had 400 palm oil seedlings and said he planned to donate some of them to the WDA once fully matured, which should encourage planting though obviously not of Acacias.

Despite wanting outside help, the women do not expect it and thus have made plans to work independently if necessary. They note that local tools made by the blacksmith will be sufficient, and that ashes can be used for fertilizer even if they are not as good as commercial fertilizer. They also plan to provide food for work for all at the tree planting, since this was an effective way of encouraging participation in the past. Despite their planning, it is still unclear when and if the plantation will begin given that women must still focus on subsistence. However they appear very determined and well-educated about the work that lies ahead.

The Women's Wing, Rorainka Farmer's Association

The Women's Wing was formed in 1989, because, as the leader explained, "Local NGOS said women must have an association, but still they gave us no help. Women unite and give little something so that our vegetables will grow." The women have a 15 acre plot on which they plant groundnut, peppers, garden eggs, cassava, etc, and split the profits at the end of each season. As one woman explained, "After the sale we take money to our husbands and advise them how to spend it. We advise the men the best way possible so that they won't misuse. Everyone listens to every possible advice because after ten years of destruction we want to develop." The women lease the land from the community despite owning their own parcels, because this land is closer to the village. A new plot is selected each year.

The Women's Wing other key concerns are with housing, education, the provision of micro-credit, and improving farming methods. They are also interested in tree planting because, as one member explained, "Even at this time there are not enough trees. We've seen for the past five years there are less trees because of charcoal. We did several times sit and talk about the lack of materials now." If provided with seedlings, they would like to plant on their farms and by their houses, because they say trees can be used as windbreakers, to build houses and also can be sold profitably. They note, however, that they cannot plant on community land and thus would have to plant on their private land which is far away. They would also want food for work to plant, because "without food for work we will still plant, but not in a large area—you cannot work well when you are hungry." The combination of these factors: lacking

seeds and long-term land tenure, means that the women's wing has no concrete plans to begin planting, though if presented with the opportunity to do so would most likely become active participants, as they were in the past when collaborating in community tree plantings.

Rorainka Farmers Association (RFA)

The RFA is a branch of the national farmer's association with over 420 members from Rorainka and five surrounding villages. The association supports both collective and private farming, and also helps organize collective projects such as road repair and tree plantings. It was founded in 1983, dissolved during the war when people fled, and then reconstituted in 2000 when people returned. The RFA meets twice a month on a Friday or Saturday to discuss potential projects, distribute inputs when available, and share farming techniques. Dues are not collected with consistency, though one member reports, "During meetings problems arise and if we need money we collect it, but its not all the time...it might be 1 block, 2 block [Le 100 or Le 200]...if you don't give we won't make problem." The RFA has been traditionally all male, but is now trying to expand membership to women as well. As one member explained, "Now because of gender equality we want half and half in the association. Now any woman is allowed in but they are busy with the Women's Development Association...In any community women have a great role to play because of gender equality. We are trying to get girls education, now we are trying to get women on board. Women are growing...at first there was competition between women and men's organizations. After the war the media played a great role in sensitization on the importance of women in society. We all mingle together and make development."

Before the war, the RFA focused on planting rice, cassava, maize, and groundnuts collectively. They also distributed resources from the Ministry of Agriculture and coordinated the use tractors. The RFA also organized six years of tree plantings in conjunction with community leaders, planting on over 20 acres of land. Since the war, the RFA has focused on supporting the reestablishment of farming, which has been a difficult task. As one member explained, "In the war our property was vandalized, and we are trying to rehabilitate but farming was very slow...we have no capital and no good storage, thieves and rodents get our cassava...the harvest stays in the farm too long and is destroyed by rain or ants." Men were also concerned that without tractors, they are unable to farm as much of the bully lands as they would like, and that farming by hand is far more time-consuming, with lower yields.

Members of the RFA are very enthusiastic about tree plantings and proud of their role in planning and leading tree plantings. Since the war, tree planting has been less of a priority given immediate needs for food and shelter. In 2001 and 2002 trees were planted in conjunction with the WDA, but these were few because people were concerned that they could not protect more seedlings from wild fires. 200 seedlings were prepared for 2003 and should have been planted in August.

RFA members stressed that planting must be voluntary: "A community is a group that lives tighter and shares together. Friends, brothers, sisters, villagers, all provide food so that everyone will work without grumbling. People offer land for planting and take care of the seedlings." The RFA notes that before the war they worked with the District Forest Officer, and had discussed in a recent meeting that they would go to him and ask for more seedlings this year. Even without the DFO, the RFA members are very knowledgeable about tree planting, and feel confident to work even without Forestry's support. One leader explained, "We know how to start a community nursery to make seedlings...we can buy black plastic and cut it to make polythenes. We will get contributions from members. Forestry already taught us to plant trees before the war....let us try and meet with these people, we say, but we can do it ourselves too...since the war we have just been planning for more...there is great enthusiasm for acacia. They are cash crops and a form of long-term investment...People are cutting sticks to make charcoal. One day trees will be short so we want to plant more Acacia than oil palm. We can use them for charcoal...we plant Acacia because they are scarce and we already have the wild plantation."

Conclusions

Overall, it appears the people of Rorainka are on the path to sound forest management. Being a small community, their leadership is well-respected and local laws are, for the most part, followed. The leadership is very knowledgeable about trees and committed to planting, setting an example for others. Not only are people committed to planting as a form of reforestation, but they have also taken care to promote coppicing in order to preserve their existing stock of native trees. They have educated themselves extensively in the ways of tree planting, and have a system for passing this knowledge to the next generation through their training program. Unlike other communities which say that they cannot plant trees because "an empty bag cannot stand," in Rorainka they say, "without help, we can do our small bit, but with help we can do more." They acknowledge their limitations but do not let that impede action—their relative lack of experience with NGOs has allowed them to avoid building any major dependencies. The community takes pride in its reforestation efforts, and values cooperative work. People enjoy coming together, and are able to collect community resources for planting; for example, community land has been granted to anyone wanting to organize tree plantings. It is also important to note that people are well aware of the economic benefits of planting trees, which make tree planting more concretely desirable as a long-term investment. Finally, because the village is small and thus organized groups are large proportionally, it will be easy for such groups to guard their resources and ensure they receive the long-term benefits of the trees they plant.

Still, there are some factors which could test their experience and determination. Hardship after the war has made it difficult for planting to restart in a significant way. It is beyond the scope of the researcher to decide how long it takes for a community to reconstruct after such atrocities. Given that the

institutional memory exists in the community, it is likely that planting will restart, though perhaps not without some commitment from forestry to begin providing seedlings again, or at least seeds for people in Rorainka to start a community nursery. Forestry in general has few resources, but that which it has -seedlings and technical knowledge- are the two most sought out by people in Rorainka. This is a situation in which with minimal effort, Forestry could have a very positive impact in the area, but only if contact is reestablished. Also, since the war charcoal production has expanded the scope of forest exploitation, and thus while previously coppicing appeared adequate to maintain the tree stock, this may or may not be sufficient in the future. Many people say that the Acacias planted are used as "a reserve" for when the "wild plantation runs out," but Acacias and native trees are by no means close substitutes. Some people insist that they cannot be used to make charcoal, nor produce good firewood, and whether or not this is true, it would be hard to encourage people to switch their production and consumption patterns. Additionally, Acacia trees do not support the variety of wildlife as the native trees do, and people are dependent on this habitat to provide homes for bush meat and other food and medicinal species.

Recommendations

1. Continue working to revive community institutions around tree planting, making contacts with Forestry to support this work. Some resources such as a community nursery, with great start-up cost but minimal maintenance cost, could be easily established with some support from outside Rorainka. The people in Rorainka have the skills, determination, and economic incentive to maintain them.

2. Diversify tree planting efforts to include native species, so that if people find acacias are not adequate for all of their needs, more native trees will be available. Acacias can still be used for housing, storm protection, soil protection, etc., but perhaps should not be relied on so heavily to serve all purposes in the future. Acacias are best in situations when rapid growth is needed due to heavy deforestation, and this is not the case in Rorainka. People in Rorainka, given their use of coppicing, could grow more slow species without fear of extensive short-term deforestation.
3. Review other types of charcoal manufacturing to ensure processes are energy efficient.

Conclusions and Recommendations

These three case studies offer important lessons for stakeholders in Sierra Leone's environmental future. Though their story is undoubtedly one small piece of the puzzle given the country's great diversity of cultures, it tells us what questions must be asked in planning tree planting programs. The following general recommendations will examine key insights obtained, and offer advice on the successful implementation of tree planting projects in Sierra Leone. They generally do not require additional funds from organizations, but rather call for a change in approach that will ensure that programs are more efficient and effective.

1. **Any tree planting intervention should begin with a consideration of the five key factors affecting the tree planting decision.** Between income, access to land, security of land tenure, access to tree planting resources, and community norms and leadership, which are the true barriers to tree planting in the community? In the case of Tombo, free seedlings were available to people but not used because of difficulties with land tenure, income and leadership. In Rorainka, however, free seedlings would have been planted but were simply unavailable. Given that the forestry and local NGOs have scarce resources, they should only give seedlings to communities whose limiting factor is access to tree planting resources. They should also work with communities such as Tombo to first ensure that land concerns, among others, are properly addressed before bringing in seedlings. In Tombo, for example, setting aside more hectares of the forest reserve for community tree planting, with a clear profit-sharing scheme, would be more effective than the private provision of seedlings. This sort of careful assessment must be made in every community.
2. **Through consultation with both community members and scientists, make sure that seedling varieties are appropriate to local conditions.** The planting of thousands of acacia trees is not reforestation, but the monocropping of a foreign specie and must be recognized as such. Acacias are fast growing and burn well so could be useful on firewood plantations. However, in the forest reserves native tree species should be planted so as to maintain Sierra Leone's great biodiversity. Finally, many people were suspicious of the acacia tree because they claimed it did not burn well, or that the government would claim any land planted with acacias as forest reserve. Either these attitudes must be dispelled through education efforts, or seedling providers must turn to other species of trees which are more locally accepted.
3. **Focus on educating communities about the benefits of tree planting and train them in the technical skills necessary.** Tree planting is an economically viable activity that should occur without outside intervention, if properly explained and if other barriers to planting are not strong such as lack of land access. Many people were pleasantly surprised to see economic calculations of the tree planting decision, having never imagined they could be so profitable. Others, such as in Rorainka, already recognized the economic and intrinsic benefits to tree planting but did not know how to maintain a nursery. Even 1-day trainings could have a terrific impact on communities that are excited to plant trees, but lack the knowledge to do so. Careful targeting of communities for education efforts could save both time and money, as once

they have established a tree planting culture they will continue planting independently.

4. **Greater coordination is needed between local and national government officials, NGOs and other stakeholders.** There are hundreds of people working for Sierra Leone's environmental future, but often they do so independently or adversarially and thus compromise each other's efforts. More frequent meetings across levels of government and between key stakeholders, at both local and national levels, would help with the building of trust and greater collaboration. This could be achieved through the creation of local, regional, and national Forest Councils that ensure all stakeholder's voices are heard. They would also prevent leaders from claiming forest management was not their responsibility but that of another party, by broadening the circle of accountability.
5. **More research on and dissemination of energy-efficient stoves, fish processing methods, home construction, fire prevention methods and charcoal production.** This would greatly lower the demand for wood without great cost. Because energy-efficient devices are often more cost-efficient as well, individuals are typically willing to invest in them as witnessed with the improved banda model.
6. **NGOs and government offices should help people explore other income options that are not dependent on forest resources.** Lowering demand for wood could have detrimental effects to unemployment. Complementary programs should be put in place, such as the support of alternative crops, to support this transition.
7. **Tree planting interventions must be long term.** Organizations must expect to be involved with a village for the entire lifetime of the tree specie and budget accordingly. Giving food for work to plant trees will by no means ensure that people are prepared and willing to maintain the trees over the long run. Food or other payment should not be used as a motivator if other barriers to planting will render the effort unsuccessful, unless lack of food is the barrier itself.

This report honors the work of devoted individuals, and also aspires to support it further. It is a call to action for collaboration with Senehun, Tombo, and Rorainka, as it has clearly articulated ways that cost-efficient, effective interventions could have a great impact. We invite any organization to use our recommendations as the basis of successful programs in these communities. We also hope that this report will inspire groups to embark on the same sort of research before entering any community, so that they can assess local barriers, strengths and needs. The situation in Sierra Leone is dire. but by no means hopeless. With careful planning—but most of all, action and determination—Sierra Leoneans will have a bright environmental future.

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