

Nyumbani Village: Growing Sustainability Organically



Figure 1: Polyculture plantings at Nyumbani Village provide fresh, organic vegetables and biofuel with minimal inputs (pictured are spinach, kale, coriander, tomato, pepper, melon, onion, and beans with jatropha and castor oil shrubs).

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Summary: The GEMSAF manager visited Kenya from November 26-December 20, 2007 to review 2007 accomplishments and plan 2008 activities with project partners in Nairobi and the field site, Nyumbani Village. GEMSAF renewed contracts with Nyumbani and the GEMSAF in-country coordinator, and created detailed work plans for technical agroforestry and business development field activities at Nyumbani Village for four Kenyan interns and four GEM student ambassadors in 2008. This report highlights the many accomplishments and organic developments at Nyumbani Village.

I. Reconnaissance with Nairobi partners:

COGRI/Nyumbani: Sister Mary Owens, (COGRI Executive Director) warmly greeted GEMSAF manager John Sheffy, and agreed to continue the partnership with GEM for 2008, remarking the gratitude of Nyumbani to the technical support provided by GEM. Since beginning the Kenyan internship program in 2006, Nyumbani has enhanced each of its sustainability programs with GEM interns and recruited two of them as sustainability staff. Philip Ndichu also happily renewed his contract as the GEMSAF in-country coordinator for 2008. Owens emphasized that the Nyumbani Village priorities for 2008 are to demonstrate profitability in the sustainability programs. To accomplish this, she asked GEMSAF to facilitate a fiscal review of 2007 sustainability program activities and assist with developing budgets for 2008.

Bridges Organic Health Restaurant: Ann Mbuga, owner of the ever-popular Bridges Organic Health Restaurant in the Nairobi business district, anxiously anticipates the day when Nyumbani Village can regularly supply her restaurant with organic fruits and vegetables. Since opening in September 2006, her restaurant has been challenged to maintain a consistent supply of quality produce. Bridges primarily buys produce from small-scale organic growers and cooperatives that are limited in production scale and consistency. She would prefer having a relationship with a larger farm, like Nyumbani Village, to supply the bulk of her restaurant needs with less transaction costs. Despite the current lack in supply, the Bridges chefs and clientele are adaptable to the seasonal availability of different specialty items. The mainstay of Bridges continues to be a wide variety of detoxifying juice cocktails, whole grains, and gourmet, yet traditional, vegetable-rich dishes, all of which are organic. Ann and Philip Ndichu discussed the production calendar for Nyumbani Village and anticipate beginning delivery with the next harvest. The sustainability program will need to access high-value Nairobi markets like Bridges to generate cash inflow to pay for management of food production for village residents.



Figure 2: Eco-friendly charcoal made by CHARDUST LTD. and marketed at Su Kahumbu's Green Dreams Organic Shop, a niche market Nyumbani Village hopes to enter soon.

Kenya Organic Agriculture Network: GEMSAF met with Samuel Ndugu at Bridges Organic Health Restaurant. Sam manages organic marketing for the Kenya Organic Agriculture Network (KOAN) based in Nairobi. Recently he has been working on planning a farmers market in Nairobi, streamlining group organic certification, and expanding retail outlets like Bridges and green grocers around the country and East African region. KOAN recently developed an urban organic garden demonstration plot at its office in Nairobi, where they grow a diversity of fruits and vegetables. Located next to the International Center for Insect Physiology and Ecology (ICIPE) apiary, the two demos make a model urban farm. Sam said they are contacting interested partners to transform urban lots into edible landscapes in other parts of the city. This may be an opportunity for GEM Student Ambassadors to practice organic agriculture in an urban setting. KOAN also publishes a quarterly organic magazine, Kilimohai, which will soon feature an article on Nyumbani Village written by GEMSAF's John Sheffy and Philip Ndichu. View Kilimohai and other KOAN publications at www.koan.co.ke.



Figure 3: Large-scale solar dehydrator built by students at Jomo Kenyatta University of Agriculture and Technology.

Green Dreams Organic Shop: John Sheffy caught up with Su Kahumbu at her Green Dreams Organic Shop in Gigiri. Su recently opened a new retail outlet, The Organic Corner, in the Westlands Nakumatt, the largest and open 24-hour supermarket chain in Nairobi. Sales at the new shop are promising, but like Bridges Restaurant, Su also continues to struggle with consistent supply from farmers. She said the new Organic Corner has to stock different kinds of produce every few weeks due to fluctuations in supply. Luckily, customers continue to buy whatever they have. Kahumbu thinks if they could offer a consistent variety of products, while regularly adding new items, the sales would continue to grow and take over a larger portion of the Nakumatt produce section.

Being one of the pioneers in organic farming and especially retailing in Kenya, Su Kahumbu is intensely aware of the economic challenges in developing the new industry. One of the main problems is scale. She cannot afford to buy thousands of units of packaging and labeling materials, for example,

like conventional retailers can because of the small scale of supply from her farmers. Because she buys fewer units at one time, the cost per item is higher. She hopes there will be more growth in the organic market chain soon for businesses that cater to small-scale producers. When this happens it will be a direct result of Su's tireless efforts and inspiration of other entrepreneurs. Until then she relies on educating her consumer base of the value, and thus higher cost of her products. Visit the Green Dreams website at www.organic.co.ke to learn more about Su's businesses and recent milk hygiene testing endeavors.

Jomo Kenyatta University of Agriculture and Technology: Philip Ndichu recruited two Jomo Kenyatta University of Agriculture and Technology (JKUAT) students for short internships during September 2007. GEMSAF visited the campus to discuss future recruitment. Dr. John Mwangi Gathenya of agricultural engineering asked for future internships descriptions so he can distribute them to interested students, as did faculty of horticulture and environmental technologies. A former JKUAT intern, Judith Mwendu, guided a tour of solar dehydrators, solar refrigerators, oil seed presses, and honey extracting devices developed by her classmates. At JKUAT, an innovation or invention can be substituted for two academic publications towards one's degree or faculty promotion. As such, the campus is a whirl with all fashions of human and solar powered wonder machines! Dr. Mwangi displayed the environmental technologies department's models of biogas capture from animal waste that is used to cook their morning and afternoon tea. JKUAT appears to be an extremely valuable partner for Nyumbani Village to supply energetic and innovative student interns.



Figure 4: Former GEM-sponsored, JKUAT intern, Judith Mwendu, and Philip Ndichu inspect a manual oil seed press and bicycle-gear honey extractor, both appropriate-scale technologies that could be of great use at Nyumbani Village.

Kenya Institute of Organic Farming: The Kenya Institute of Organic Farming (KIOF) continues to supply the majority of GEMSAF interns to Nyumbani Village. At present, two interns and the staff Farm Foreman are from KIOF. Dr. John Njoroge invited GEMSAF to KIOF to use the school as a training ground for introducing GEM Student Ambassadors to organic farming in May 2008.

II. Nyumbani Village: Rainfed agriculture is in full swing at Nyumbani Village with the onset of the November-December long rain season. Three hard rains fell during one week, amounting to nearly one quarter of the year's rainfall! This water filled the eight sand dams and adjacent shallow riparian wells, which supply the village drip-irrigated vegetable areas. The rains also provided ample moisture for rainfed crops, including maize, cowpeas, sunflowers, green grams, wing beans, pigeon peas, sorghum, and millet, which look well on their way to another large harvest.

GEM Kenyan Interns: Martin Wanganga, one of the KIOF interns has been busy working in the perimeter shambas (gardens) since his arrival in September 2007. The perimeter is a production area where members of the surrounding community access land at Nyumbani for rainfed crops. Martin has been coordinating the intercropping planting pattern and encouraging farmers to plant and weed their fields on time.

During the dry season these farmers irrigate smaller portions of the perimeter to grow vegetables. In theory, this provides a win-win situation whereby the village benefits from a living, working boundary of farms, while the community harvests food. However, Martin's work with the community group has exposed several challenges. Most of the perimeter shambas are ploughed by oxen. Since everyone in the surrounding community is currently plowing as fast as they can during this brief rainy season, oxen are in high demand. The farmers attracted to the perimeter shamba land use agreement are some of the less well off farmers in the area and must rent oxen for plowing from their neighbors. Due to the lack of oxen availability, many perimeter shambas got off to a late start. Squirrels, Guinea fowl and other pests have heightened problems by stealing seeds and chewing off young plants. During the dry season perimeter growers need to visit their fields daily to water, but are preoccupied during this season, leaving the boundary open to other intrusions as well. These challenges must be kept in mind as the village attempts to engage the surrounding community in more land use at the village.



Figure 5: GEM-sponsored KIOF interns, Martin Wanganga and Anthony Kitonga, working in the rain-fed Nyumbani

perimeter shamba area.

Anthony Kitonga, another KIOF intern has been working with village families on vegetable gardens and half-acre rainfed shambas surrounding their houses since his arrival in October 2007. Anthony advises and encourages them to plant ridges of greens, onions, tomatoes, and other vegetables to be irrigated with gray water from washing dishes, clothing, and bathing. Based on his efforts, and those of previous interns, the village is purchasing barrels and drip lines for each of the families to easily recycle gray water into an automatic irrigation system. Anthony is also helping them with composting organic wastes, intercropping, and pest management. In half-acre, rainfed shambas adjacent to their homes, the families are planting rows of maize, beans, castor, and leucaena. By the end of his internship, Anthony plans to have fully developed several homes into model gardens with sources of vegetables, fruits, grains, fodder, fuelwood, chickens, and a milking goat. With time the residents will learn the organic farming systems in micro-scale at their homes, and will eventually take on greater management of the main village farms.

The third GEM intern at Nyumbani Village, Zach Mutunga is an intern from Kenyatta University working in the forestry area. He has remodeled and expanded the production of seedlings and outplanted over 5,000 seedlings since the onset of the rains. He hopes to scale up propagation between now and the next short rainy season in April with at least 10,000 seedlings of multipurpose dryland tree species. The growth of rainfed crops, vegetables, and trees in all areas of the village is truly phenomenal and prove the success of permaculture at the village.



Figure 6: Hundreds of jatropha seedlings being propagated and maintained by GEM-sponsored intern, Zach Mutunga.

III. Sustainability 2007 Review and 2008 Budgeting

During the week of December 3-10, 2007 GEMSAF and the Nyumbani Village Sustainability Program reviewed the 2007 production results, and discussed the successes and shortcomings of each sustainability activity and how to improve. Specifically, this group brainstormed how to reduce costs and increase production quantity and consistency, while maintaining organic quality. The outcomes of the review include which activities should be pursued as the core sustainability projects for 2008, as

well as individual budgets for these activities. After preliminary meetings, the group met with Nicholas Makau, Nyumbani Village Manager on Dec. 6 to discuss the sustainability review and village-wide policy recommendations. The following is a record of these activities.

Fiscal Review: GEMSAF in-country coordinator, Philip Ndichu, conducted a thorough fiscal analysis of the 2007 budget to account for what seemed to be a large loss. He concluded that the majority of the costs in the 2007 budget were not directly related to operations. Some of them included capital investments in infrastructure, while others were long-term investments in multi-year crops (trees and biofuels). Even operational costs like clearing land for vegetable production are one-time investments that will be maintained in continuous production rotations for many years. With these allowances for investments, the operations budget nearly broke even for the year. The main reasons it did not show a profit as was forecasted were high labor costs, unexpected crop losses, and failure to harvest and market produce during peak production times.

High Labor Costs: Unexpectedly high labor costs were due to several factors. Labor in 2007 was primarily paid in daily rates. This proved to be more expensive than paying community members for piece work, which is now being practiced. However, piece work may still prove to be prohibitively expensive unless the village is able to add value and reach beyond the limited local agricultural markets. Community members hired in 2007 also turned over frequently during the season. This meant more time was spent each day training new laborers, which resulted in wasted time, less efficient labor, and lower quality and quantity produced.

Based on these experiences with labor, it does not seem effective to continue to hire laborers on a large scale for agriculture activities at Nyumbani. The rates of payment, either daily or piece work, are higher than most farmers make in normal agriculture activities in the area, thus Nyumbani will always be at risk of losing money by paying for labor. Other, creative means of engaging surrounding community members, like the perimeter shamba system, must be pursued. This will rely on a fundamentally different view of labor and income generation between Nyumbani and the community, one based on longer term investment and mutual trust.



Figure 7: Experimental comparison between sunken and raised bed cultivation by GEM Intern, Martin Wanganga.

Unexpected Crop Losses: Several types of crop losses occurred in the main farm vegetable gardens during 2007. One of the areas opened for vegetables, the sand dam riparian area, did not have drip irrigation. This sand dam dried up unexpectedly early in the dry season, leaving this area without irrigation water. This single area resulted in a great cost invested in land preparation and labor with no returns. Several other production areas experienced water-related diseases and pest problems, which limited production. Part of the reason for these problems was having too many areas in production at one time, which spread both water and labor too thin. When labor and water became temporarily scarce, many areas suffered due to lack of attention. In some cases, particularly varieties of the curbit family like melons and pumpkins, almost all plants were lost due to water stress diseases. For the sustainability program to be profitable, it must take great efforts to avoid any crop failures, particularly if labor is still being paid for in advance of any harvest. If laborers have a shared stake in crop harvesting, they may have a greater incentive to care for plants as if they were their own, working with responsibility for the same plants throughout the season.

Lack of Harvest: At certain points in the 2007 season crops performed very well but were not harvested due to a shortage of labor, and/or a lack of demand by the village. The lack of demand is the most troubling and is due to inconsistent homecare purchasing. For example, one week homecare might have purchased a large quantity of greens, while the next week they would not purchase any, leaving many ripe greens in the field wasted. During other times there were surplus amounts of crops like eggplants, capsicum, and other less familiar crops that homecare could not distribute because families had other, less nutritious, food choices like rice and potatoes purchased by homecare outside the village. In order to be successful economically, sustainability programs must harvest as much as possible from all areas where investments have been made, and find new ways to distribute produce to the families and other local and higher value markets in Nairobi.



Figure 7: Propagating vigorous vegetable seedlings continuously is a critical step in the Sustainability Program. Nyumbani can increase efficiency and empower community members with high skilled positions like these using contracted, commission based employment rather than daily wage rates.

Specific Sustainability Program Recommendations:

The scope of sustainability should be narrowed to focus primarily on food and fuelwood activities in 2008. The 2008 budget does not include investment in peripheral activities that, at the moment, sustainability does not have the capacity to manage. Food and fuel activities include: rainfed agriculture for grains, drip irrigation for vegetables, animal husbandry for milk, meat, and eggs, and carbon farming for firewood (jatropha crops will also be irrigated simultaneously with vegetables). Most of these activities are beyond the capital investment stage, thus most 2008 investments will be operational costs that should be recuperated with modest profits.

It should be noted that, in general, the aforementioned food and fuelwood activities are not major money-making endeavors. They are money saving activities, since it should cost less to produce food and fuel than buying and importing them, something that would also contradict the vision of the village. Only once these basic needs are being consistently met should sustainability pursue higher risk, higher potential profit activities like value-added agroprocessing, beekeeping, specialty crops and livestock, and other diversified income generating sources. Ideally, these will happen soon, either through donor funding for specific new initiatives or incremental investment with modest sustainability profits.

To resolve labor issues several approaches will be taken. In areas where labor is still being used, temporarily until better contract methods are developed, labor will be carefully implemented to decrease the number of laborers hired and increase the efficiency of time used by each laborer. Laborers will also be hired based on their availability for the entire production season to reduce turnover and retraining. Sustainability will try hard to incorporate the village families as much as possible. The rainfed shambas show promise to engage the families in a larger portion of their food generation. This will save both homecare and sustainability money by eliminating labor costs.

To decrease crop losses due to disease, pests, and water shortages, sustainability will decrease the total

acreage in irrigated vegetable production. At any one time, two production areas will be in rotation for vegetables. This will allow more attention to be paid to them, assuring adequate water, weeding, bio-pesticide application, and other care that will increase production. This should also result in decreased labor costs, management costs, and a larger percentage of crops being harvested.



Figure 8: Large baskets used at KIOF to deliver fresh produce to Nairobi families in their "basket scheme". Each week the families at Nyumbani Village will pick up their baskets at the agroprocessing center, bringing them closer to their food.

Pilot Initiatives for Community Led Micro-enterprise: The Sustainability Program will undertake a pilot project to engage 2-4 laborers in a produce-buying relationship similar to that of the perimeter Organic Outgrowers Group. In this pilot, laborers will be supplied with land, water, and seedlings at no cost, but they will not be paid any labor wage. Instead, the village will buy their produce at the local vegetable price rate. Sustainability will then add the costs of water, land preparation, seedlings, and organic management to the final sale price to homecare. We believe this relationship will reduce production costs, management time, and increase production per acre.

To increase harvesting of mature crops, sustainability will begin a new system of supplying families with fresh food, called a basket scheme. In this scheme, each family will pick up a basket of fresh produce from the agroprocessing center 2-3 times per week. Each basket will include a generous, consumable portion of all ripe vegetables available in the farm at that time. This will encourage eating more fresh vegetables, eating them at their peak of freshness and ripeness when they are most nutritious and tasty, and reduce the need for homecare to purchase outside of the farm. This will also engage the families more in their food system by giving them the task of picking up their baskets. Maybe they will transition from this to helping pack the baskets, to helping clean and process the vegetables, to helping harvest, and even one day helping grow in the main farms. The basket scheme will make harvesting more flexible for sustainability as well.

In addition to the core sustainability activities GEMSAF would like to facilitate the development of business plans for a number of peripheral sustainability activities for donor investment. At the moment these include: beekeeping, agroprocessing, and woodlots. An Italian volunteer has also prepared a business plan for polytechnic investment in woodworking.



Figure 9: Experiment comparing jatropha growth when planted with and without compost, by GEM Intern turn Farm Foreman, Millicent Musau.

Future GEMSAF Kenyan Interns: GEMSAF plans to continue providing technical support to the sustainability program with Kenyan interns. At the moment there are three interns working in the areas of forestry, homecare, and the perimeter. Two interns will be recruited to serve from May-August and two to serve from September-December in the areas of livestock, perimeter gardens, home gardens, and main farm activities. GEMSAF hopes that some of these interns may be recruited as Nyumbani staff in these or other areas based on their performance.

GEM Student Ambassadors: GEMSAF also plans to provide four GEM Student Ambassadors from UWSP from May-August 2008. Each morning this team will work together on manual labor activities, such as the main farm, forestry, homecare, or perimeter, depending on the need for labor. In the afternoon, each student will work on a specific sustainability project.

Two GEM Student Ambassadors will work on independent research projects in the area of forestry on planning fuelwood harvesting and planning reforestation. They will work in partnership with the GEM Kenyan forestry intern or forestry staff member if one is hired by the village. Another GEM Student Ambassador will work under the guidance of Millicent Musau on evaluation of polyculture techniques in the main farm drip irrigation area. The fourth GEM Student Ambassador will work in the homecare designing and implementing model home gardens in partnership with a Kenyan intern.

Over the course of the 12 week service, the UWSP students will have the opportunity, at their own cost, to participate in 4-5 weekend work trips to various projects in other parts of the country, possibly including: Rodi Township Ecovillage (western Kenya), Lea Toto (square meter gardens in Nairobi slums), KOAN/ICIPE (urban gardens and beekeeping), Su Kahumbu's Green Dreams Ltd. (organic farm and shop), and Mt. Kenya (intensive agroforestry design).

In both the Kenyan interns and GEM Student Ambassadors, GEMSAF is building capacity in

Nyumbani residents and surrounding community members to continue building sustainable agriculture and forestry activities at Nyumbani after the end of their service and the GEMSAF program.

Volunteer Program: Volunteer programs should be organized so volunteers fill critical technical gaps while not putting any additional burden on current staff. Ideally the village will advertise positions needed to fill and recruit specific volunteers through a competitive application process. To do this, we recommend that a staff member at the village agree to be the day-to-day counterpart of the volunteer and write a detailed volunteer position description that can be advertised through the board of directors or website. The GEM internship position description could be used as a template for this. During service, volunteers and staff counterparts should report regularly to Nicholas Makau to assure their activities are fitting into the larger village goals. Each volunteer should end their service by writing a report that stays on file at the village for staff and future volunteers to consult. There are needs at the village currently for sustainability volunteers in environmental education (household conservation), organic farming, agroforestry, and nutrition.

General Nyumbani Village Policy Recommendations:

Nyumbani Village staff from homecare, sustainability, and accounts should hold regular monthly meetings to create a new relationship between these departments for a holistic management strategy. It must be appreciated by all that sustainability has a difficult task of producing raw materials for the village. Likewise it must be appreciated that homecare has a difficult task of managing the village residents. Finally, all must understand the fiscal limitations on the village.

All homecare and sustainability activities should be coordinated to send complimentary messages to the village residents. For example, homecare must emphasize resource conservation parallel to sustainability. Ideally records should be kept by each family of their consumption of basic resources, like water, fuelwood, food, and waste produced.

All village activities should be geared towards greater involvement of families. The families will likely gain a greater appreciation for activities they are directly involved in and this will decrease village costs, for example the villagers are currently actively taking up food production in their compounds and rainfed shambas with little guidance, which over time will lead to them becoming more involved in other sustainability activities.



Figure 11: Outrageously lush production of vegetables, biofuel, and trees in the Riparian Woodlot Management Zone. Fields like this demonstrate the incredible potential of the dryland under sustainable management. The challenge for Nyumbani Village now is to decrease costs by building community, something that can only be done organically!