

Healthy and Beautiful Yamoransa

A Garden Village for Ghana

"Teach them to create bounty and beauty from the dirt and they will thrive."



Alrie Middlebrook
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Healthy and Beautiful Yamoransa



Big sister making popcorn.

(A draft environmental and nutritional work plan promoting sustainability.)

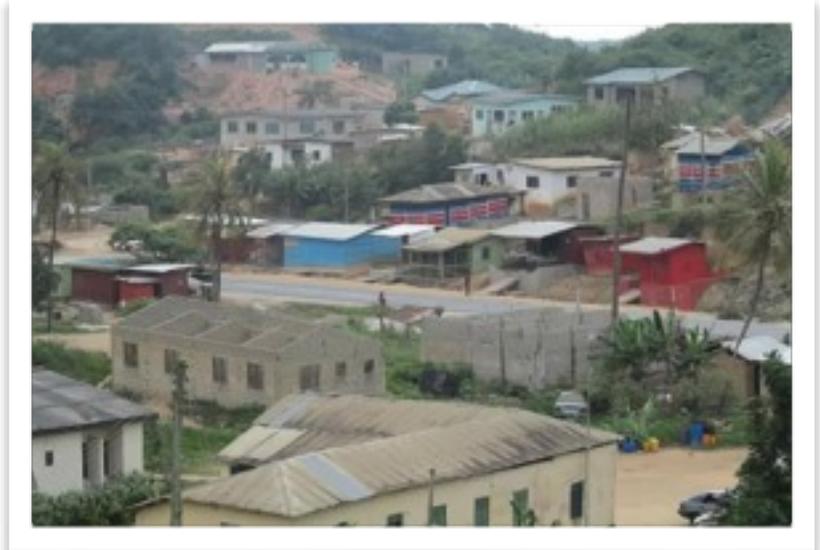
Our stakeholders are :

1. The people of Yamoransa, their leaders, chiefs and elected officials, including their Village Council, religious leaders, public servants, teachers, business people, students, families and all the plants, organisms, soil, water and air of the coastal savanna ecosystem of Ghana.

2. Yale Alumni Service Corps, its leadership, including Mark Dollhopf and Kathy Edershein, its membership, affiliates, and its available resources for this project.

3. American Field Service in Ghana under the leadership of Mr. Kwame Otcher , its membership, students and volunteers, its affiliates and its available resources for this project.

4. The Universities of Ghana, in particular, U.C.C., Cape Coast and Professor Kofi Awusabo-Asare and his leadership as a local Ghanaian professor, who has demonstrated his skills and passion for improving the lives and environment for the Yamoransa people. In addition, we are seeking leadership, specifically from those Universities who have departments, professors and students who have skills, knowledge, interest, and field experience in sustainable agriculture methods, including erosion control, landscape



Yamoransa Village.



Yale Alumni Service Corps



Hon. Comfort Garbrah with Deborah Rose.

architecture that protects ecosystems services, organic farming methods, soil science, biogas digesters, alternative stove designs that use biogas, biofuels, diverters, revegetation best practices, health and nutrition, organic food production, marketing and promotion including organic farming business models, and long term sustainability management protocols suitable for African ecosystems and cultures.

5. The California Native Garden Foundation, its President Alrie Middlebrook, its members, partners and the internship programs at its affiliated universities in California, including University of California at Davis; San Jose State University; Santa

Clara University; University of California, Berkeley extension; Stanford University; Cal Poly Pomona and several community colleges.

6. The community of Los Gatos, California, Los Gatos High School and students in AP Environmental Science Class, including Brooke Ahmed, project leader.

To the best of my knowledge, the problems that this draft work plan addresses exist in Yamoransa today. These are sanitation, erosion, deforestation, nutrition, and unsustainable agricultural methods.

Some of my observations were made with



Chief of Yamoransa with Hon. Comfort Garbrah and her husband, Steven.

Deborah Rose, YASC, on a tour through Yamoransa as well as discussions with other members of the public health team, and Daniella Aburto Valle, YASC, members of the business team, Monisha Merchant, YASC, and Gerry Slater, YASC, as well as private observations and conversations with the villagers, their leaders, teachers, students and AFS leaders, and volunteers.

Deborah Rose also introduced me to Nana Nana Yandoh Kesse V, Chief of Yamoransa and Hon. Comfort Garbrah, Assembly member, Yamoransa Electoral Area and her husband, Steven, who gave us a tour of the village. Here are my observations.

Sanitation

In a town of 4-5,000, people, Yamoransa has few toilets that work. Citizens defecate in small plastic bags, which are littered along the roads and hillsides, their contents having long been washed away down the steep barren hillsides.



Toilet bags on hillside.

Erosion

Yamoransa is located on both sides of the busy coastal road. These two sections of the village are built on rolling coastal hills that reach ground elevation at the road that divides them. All of these hillsides in the village and adjacent to it are severely eroded.

All topsoil is long gone in these areas. During the rainy season, sediment flows to some concrete channels on steeper slopes. It mostly flows directly off hillsides to concrete



Soil erosion at Yamoransa.

channels and a v-shaped channel adjacent to the road on each side, making its way to the sea.

Deforestation

Most villagers use firewood from cutting down trees for cooking fuel. They also convert the firewood to charcoal.

As we traveled along the coast road, I saw evidence of tree harvesting. I saw no evidence of tree planting programs. "This coastal savanna ecosystem was originally populated with many species of trees as well as open savanna grassland. 95% of their original tropical rain forest is gone. Other than clearing land for agriculture and settlement, 90% of this loss is due to fuel consumption" (The Useful Plants of Ghana by Daniel Abbiw).



Firewood from local trees.

Nutrition

The average villager's diet is high in carbohydrates and low in amino acids derived from vegetables. They also consume large quantities of red palm oil, which has more nutritional value than regular palm oil, but is high in saturated fats. Nevertheless, red palm oil is rich in vitamins and nutrients and high in antioxidants.



Local market.

We surveyed 13-14 year olds for a list of all foods eaten in the past 24 hours to reach these conclusions. The research I did prior to my visit also confirmed these statistics, as well as observations made

in Yamoransa. However, I found Yamoransa teenagers' diets far superior to the food choices of American teenagers!

Unsustainable Agricultural Methods

I saw no evidence of community composting in the village or of actual gardening within the village. Fenced subsistence farming plots are on adjacent hillsides next to their village, and next to houses at the edges of Yamoransa. They may use sustainable agriculture methods in these plots. I did not have the opportunity to ask questions about their farming methods, other than on the first day with our host family where Michael showed me his plantain grove, which he planted 15 years ago. In these plots, they also grow corn, plantains, bananas, cassava, cocoyam (taro), papaya, okra, black-eyed peas (cowpeas), other beans, tomatoes, peppers, garden eggs (eggplants), etc. I was told they don't grow groundnuts in Yamoransa. Chickens and goats roam freely,



Artwork from Heart Healthy class.



Subsistence farm plots.

as does an occasional pig. Dogs are infrequent.

I found only two villagers who garden right next to their houses. Both men, one of whom is the village chief, are retired and have time and resources to garden. They protected their food and ornamental garden areas from animals with netting.

My observations also include that most villagers

are hard working and have little free time, the resources or the skills to implement changes to address these problems.

2. State the solutions to those problems.

A. Sanitation and deforestation.

Set up a composting toilet system that includes bio digesters for fuel and fertilizer use. The biogas could be used for fuel to reduce firewood use. Once a biogas digester system has been researched and a model selected, stove models for the biogas fuel could be selected and manufactured and sold by the villagers. This problem will require significant study and several years to test workable solutions that the villagers will find acceptable. One

solution may not be appropriate for all situations. There are most likely several types of solutions that may work for different groups in the village. Tests of different technologies would be required with villagers participation. Deborah Rose and Daniella Valle have been working on this problem and Deborah has visited other successful biogas projects in Ghana. One word of caution, in my research thus far, most composting toilet systems that have been considered for developing nations are far too expensive or complex to be adopted or maintained by local communities and are therefore not sustainable.

Erosion, Nutrition and Unsustainable Agriculture

Set up composting of green, brown, and animal waste at designated locations in the village. This program will require little capital outlay and could



Plantain grove.

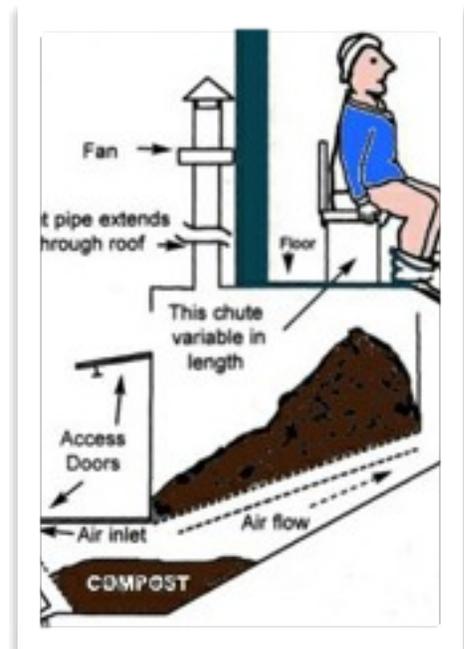


Existing toilet system.

be initiated quite easily and quickly by local Yamoransans. A teacher at the school, Edmond Abakah, has agreed to participate in this project. He will be joined by another lecturer at the school, as well as Miss Neizer, who worked as my teaching assistant in Yamonransa. Once a composting program is established, the next step is to create test garden plots on hillsides that will control erosion and improve nutrition. I left seeds with the two village gardeners for them to plant. Involving them in the development of the first garden plots is important. I advise working with them and other teachers and villagers interested in gardening to select plants they may not currently grow, such as peanuts, avocados, native greens, different selections of beans and multi-colored corn, but whose flavor is familiar to them. Once the program is established, they can grow more food than they need using organic methods, so business models for farmers could eventually be established. We will need a list of plants, as well as seed and young plant availability, sizes and prices. Four categories of plants are desired. One project for future college interns might be the construction of a propagating greenhouse for seed starting purposes.

1. Non-invasive, tropical food plants suitable to the soils of Yamoransa that are high in vegetable proteins and unsaturated fats that local people will like and eat.

2. Native grasses, perennials, shrubs, and trees of the Coastal Savanna Ecosystem that provide



Simple composting toilet system.



Avocado tree.

good erosion control, increase biodiversity, improve pollination, and may provide food or other sustainable economic value.

3. Native food, medicinal plants, and otherwise useful plants that are known by the local people or may be accepted by the people for these uses; for example, Shea Nut tree or Baobab tree.



Netted garden plot.

4. Non-invasive ornamental plants and flowers selected for their beauty, fragrance, and flowers.

All garden plots should be netted or use chicken tractors or caging of chickens and goats as alternatives to keep animals from eating garden plants.

Gather examples of places in Ghana where these problems have been solved or attempts have been made to solve them.

Show which have succeeded and failed. List names of organizers, institutions, locations, dates, sizes, waste products, biogas uses and percentage of non-use at each site. Develop a questionnaire for each of the researchers and include their participation.

Examples: Biogas Technology Dissemination in Ghana: history ,current status, future prospects, and policy significance. Authors: Edem Cudjoe Bensah, Abeeku Brew-Hammond.

AVRDC.org The World Vegetable Center - Improving the production and consumption of nutritious vegetables.

avrdc.org/?p=4356 Vegetable consumption patterns in Yaounde, Cameroon
http://203.64.245.61/web_docs/recipes/nature's%delights_recipe%20booklet_s.pdf

Show solutions to the problems. Engage all stakeholders in the process. This is not necessarily the order of priority.

Select most convenient and acceptable composting sites.

Create lists of appropriate plants for additional crops, including native edibles and native grassland species for ecosystem restoration, their planting and harvesting methods. Prioritize the measure of acceptance by the Yamoransa people.

Artist and landscape architectural schematics of proposed erosion control and other land improvements. (CNGF can supply some initial concept drawings.)

Demonstrate site specific best management practices (BMP) for erosion control.

Develop stove designs, engineering, fabricating, sustainability, ease of making with available resources, as possible business models for local commerce.

Research most acceptable, economic and sustainable composting methods, with an emphasis on plant productivity, water retention capacities, erosion control and potential climate change mitigation.

Research biogas designs and digester locations.

Research hillside vegetable farms and locations, integrated with native coastal savanna grassland restoration including school gardens, church gardens, and community and family gardens.



Productive compost.

Develop a 5-year plan to implement the solutions with all stakeholders. Begin the planning and create the structure for Year One. Set targets for Year One. Begin implementation phase with five teams participation.

Organize the members of the 5 teams for first year participation. Determine leaderships.

Seek funding sources with matching criteria as project requirements become established. Write grants.

As an example, a possible first phase and the easiest to implement: With the assistance of Yamoransa leadership and two teacher volunteers who have agreed to participate, Paulina Neizer and Edmond Abakah, and other AFS volunteers, a composting program can begin. Working with the two gardeners, Nana Akua and Emanuel Osae Akoto, identify sources of green and brown vegetation. Locate 2-3 composting sites. Organize local teams and 40' x 40' collection areas near a water source.

Develop a 12-month calendar when the most and least compost is available, based on planting and harvest times, rainy season, etc. Designate possible pilot composting sites near the two gardeners' homes or other willing volunteer gardeners, Comfort and Steven's home, at the schools and churches or at the town center. Begin composting collection phase to correspond with cycle of peak availability. Engage all stakeholders in Yamoransa, Central Coast University, and AFS to participate at all levels of implementation phase.



Useful compost for organic farming.

After a composting program is underway at 2 or 3 test sites, select garden plots adjacent to composting sites.

Design gardens to control erosion, restore the local ecosystem and produce nutritional food. The goal the first year is to install one pilot garden prior to correspond with beginning of rainy season or other optimal planting times.

Follow up with additional gardens, sustained by the local people mentioned above as well as others who join them, with the leadership of CC University professors with appropriate skill set and knowledge of BMP's, the leadership and volunteers with YASC, AFS, CNGF and its participating college interns and members of our local community in Los Gatos, California.

Next summer, college interns from participating universities could assist in expanding the program. I will also be pleased to volunteer my time to visit and help with the first test plot if required.

I will follow up with before and after photos and conceptual renderings, which show proposed transformations at selected sites in the next few days.

Lets get started!

On my end, I have enlisted landscape architecture interns from UC Davis to prepare concept drawings of proposed erosion control sites. I have also contracted with an incoming Masters in Soils Ecology graduate student, Emily Creegan of California Polytechnic State University at Pomona, to begin researching grants for this project. I plan to contact The Haas Center for Public Service at Stanford University to propose this project for funding 2-3 month student internships in summer, 2014. I spoke to Mark Dollhopf about this contact and await his coordination with his Stanford counterparts.

I have also received a pledge to participate in this project from Felix Por, a horticulturist at the Aburi Botanical Gardens, who is interested in helping us with the plant selections.

This work plan is broad, multi-faceted and will take time to implement but the first phase can begin with minimal capital outlays. The long term success of this endeavor will rely heavily on the active participation of the Yamoransa people, especially the key people I have stated, as well as the research and participation from our Ghanaian Universities partners. We are most grateful to Professor Kofi for his leadership in connecting us to the appropriate experts in their fields.

Let the work begin!

This is a DRAFT! Please send your comments.

I apologize for any errors, omissions, or any cultural misunderstandings due to my lack of knowledge of the Ghanaian culture and environment.

Sincerely,
Alrie Middlebrook
President
The California Native Garden Foundation
YASC volunteer, 2013