

FINAL REPORT ON SGG-ZOMBATREEZ PROJECT

INTRODUCTION

In December 2023 the Rotary Club of La Haute Vallee de l'Aude [HVA] donated 1,000 euro to Sustainable Global Gardens [SGG] for agroforestry planting & forest restoration at one of the locations where SGG was active. Furthermore, one of the members of HVA offered to donate 10,000 euro to the same project, if it could be matched by similar funding. SGG undertook a field visit to Malawi, Kenya, & Tanzania early in 2024, and concluded that Malawi offered the best location for what could become a large project. This idea was encouraged when a presentation was made to the Rotary Club of Limbe, who then expressed a willingness to partner with HVA on a large Rotary Foundation project. It was also encouraged by the obvious progress being made by small-scale farmers in the Nankhunda-Nsanama villages near Zomba. Particularly after the devastation of Cyclone Freddy in 2023, those villagers and Limbe rotarians as well as the Malawi government were all aware of the need to greatly increase tree cover in what had become a much deforested country.

After my return to Europe in March 2024 it was agreed to scale up our original plans i.e. to increase the number of beneficiaries, to extend the area of operations, and to seek greater funding support. This meant that the current 2021-2024 project would be considered a pilot project and terminated at the end of the year. Meanwhile a completely new and larger Rotary-funded project would be planned, developed and hopefully implemented in the 2025-2028 period. The November-December field visit to Zomba therefore provided the opportunity to collect final data for the pilot project as well as make some important preparations for the future.

At this point I would like to suggest to any readers who are unacquainted with this project that it may be useful to refer to two other documents. One is the 2023 Progress Report, written after SGG's first visit to Zomba. The other is the Progress Report written in March this year. These documents are both available on the website www.sustainableglobalgardens.org.uk. They provide the background context for this final report for the pilot scheme.

COMMUNITY NEEDS ASSESSMENT

In any large project it is important that the needs, hopes, wishes and capacity of the stakeholders to undertake practical action are considered. During this project such 'community needs assessment' has been done in 4 ways: by reference to official documents concerning the contemporary situation in Malawi; by informal discussion in January 2024 with members of the Nankhunda Transformation team; by a rapid survey of the opinions of 20 farmers sheltering from a heavy shower on 18th November; and by a more formal questionnaire given to the Nankhunda Transformation group leaders during their regular meeting on 25th November. The following gives details of these four components of the assessment:

- secondary sources make reference to Malawi being a peaceful but economically poor country. In the U.N. Human Development Index [HDI] it is ranked 172nd out of 193 countries. The Human Development Index and reports published by UNDP.org show that most countries below Malawi are locked in political instability/war. It is estimated that some 72% of the local population are living on less than \$2.15/day with 80% of the population engaged in semi-subsistence farming. The main food crops are maize, which rapidly drains soil fertility when grown under a mono-cropping system, and cassava, which can provide bulk food but is of low nutritional value;
- the latest [posted April 11 2024] World Bank data mentions,

- the anticipated 2024 national economic growth of 2.0% is a contraction in per capita terms given the expected 2.6% population growth,
- inflation is expected to remain high and average 27.4% in 2024,
- with heightened food insecurity, both from high food prices and shortages owing to anticipated lower agriculture output, poverty is expected to worsen in 2024,
- the Reserve Bank of Malawi devalued the Malawi Kwacha against the US dollar by 25% in May 2022. This was followed by a further 44% devaluation against the US dollar in November 2023,
- in 2022 the Malawi Vulnerability Assessment Committee projected that 3.8 million people, about 20% of Malawi's population would go hungry between November 2022 and March 2023. Cyclone Freddy in February-March simply made matters worse,
- crisis outcomes, supported by humanitarian food assistance, are expected to persist across most southern Malawi districts into 2024, driven by agricultural production shortfalls during the 2022/23 season, high food and non-food commodity prices, and disruption of livelihoods by impacts of tropical cyclones and unseasonal drought,
- income [GNI] /capita in Malawi is \$640 compared to a global average of \$12,871 and \$45,290 for France,
- the above figures are accurate as of April 2024 and illustrate the national economic context at that time. They refer to the national situation, but it can be corroborated by SGG's field visits in January 2023 & 2024 when local villagers regularly mentioned that they were hungry or in need of work/income,
- another aspect of needs assessment is, 'how can these needs be best met? For those interested in such issues, it is useful to refer to the World Food Programme's Country Report for Malawi 2023. See [Annual Country Report | World Food Programme \(wfp.org\)](#) Here it mentions a 131% increase in food insecurity in 2023 and the need for humanitarian assistance for 2.5 million Malawians. Concerning solutions to these difficulties it refers to Chapilira village in Nsanje district as an illustration of practicable actions, such as watershed management, restoration of agricultural land, regenerative agriculture. Elsewhere the value of greater onfarm biodiversity through crop diversification & agroforestry, greater use of local crop varieties, increased composting, restoration of degraded ecosystems are all mentioned. It should be noted that all of these actions have been undertaken by the SGG-ZombaTreez-Nankhunda Transformation partnership well before the publication of the above document. We have good reason to think that we have the right strategies: our problem is that at present we can be active only on a small scale.



Some parts of the Zomba Forest Reserve [see above left] look like this with a variety of indigenous species growing in close proximity and providing a biodiversity-rich environment attractive to tourists. However, most of the Forest Reserve is severely degraded and beginning to look like the bare hillsides found between Zomba & Blantyre. Population growth in recent decades has encouraged deforestation and the spread of agriculture into very marginal lands associated with low soil fertility, soil erosion, and consequently low harvest yields. In the Nankhunda-Nsanama locality there is now much more land associated with low yield maize monocropping [see above right] than original forest – and poverty is endemic in this semi-subsistence farming economy.

The second part of this community needs assessment was carried out in January 2024. A four week visit when I was accompanied every day by members of the Nankhunda Transformation team provided the opportunity for much informal discussion about the needs of the community. Two answers dominated SGG's enquiries: the need for food and the need for at least seasonal work during the "hunger months". A third need was also mentioned. This was greater protection from climatic hazards, such as Cyclone Freddy which had struck these villages less than one year previously.

During the most recent field visit SGG collected further data to confirm or refute the above. The third part of this assessment occurred when torrential rain on the 18th November forced 20 farmers to take shelter in one room. They were asked to state the two most important needs of their family. The answers given were as follows: food 16, money/income 17, fertiliser 3, better educational opportunities/school fees 2, access to better methods of sustainable farming [e.g. irrigation] 1, and to have own house 1.

One week later SGG used a questionnaire to survey 19 community leaders at their weekly meeting. The questionnaire asked respondents to tick their two priority needs from a list of 13 choices. The options on the list included:

- more food production on farm, which all respondents included as a priority need, so 38 points,
- availability of micro-finance with a total of 9 points,
- improved water supply & access to clean water with 11 points,
- better school facilities scored only 4 points
- availability of seasonal employment [piecework] with 6 points,
- more fuel-efficient stoves with only 1 point
- increased biodiversity with 4 points,
- equal opportunities for women with 2 points,
- improved soil conservation & better soils gained 19 points,
- increased local employment gained 6 points,
- building stronger climate change resilience with 11 points,
- access to better healthcare gained 3 points,
- improved sanitation gained no points

Then the 19 leaders were asked to name two other needs which were important but not the priority. The priority needs were awarded 2 points each & the important needs 1 each to give a total of 114 points. Increased food production with 38 points was clearly regarded as the top priority. The next highest score belonged to soil improvement. SGG might agree with this response, but perhaps those surveyed were influenced by SGG leading a soil improvement course that week. At first glance income/employment does not appear to be that important, but this is divided into 3 categories. If micro-finance, piecework and local employment are amalgamated, their score is 21 – the second highest. Also it should be remembered that the respondents were community leaders, who sometimes had more land or capital than the average small-scale farmer and thereby less need for additional work.

On the basis of these 4 different assessments, SGG feels entirely justified in proposing a project which is focussed on agricultural innovation, increased horticultural production and environmental improvement as a strategy for community development.

The rest of this report will describe the actions which were undertaken during the November 2024 visit, and also provide a brief evaluation of the whole 2021-2024 pilot project.

DEEP BED FARMING

This 3 year project began with a training course on improved soil management led by Tiyeni's Malawi team in October 2021. See www.tiyeni.org for details. When an evaluation based on outcomes of this training was made the results were generally positive but not conclusive. One of the crucial limitations of this course was that only 20 people were trained at a time, so it would take many years for Tiyeni's team to train the 500 or more eligible farmers. It was agreed that a faster method of diffusing this agricultural innovation through the local farming community was needed. In 2023 Tiyeni produced a manual which fully describes their training course, so in 2024 it was decided to use this manual to see if members of the Nankhunda Transformation group could apply this "deep-bed farming" themselves. This strategy involves a 6 day revisionary course based on the Tiyeni manual but with SGG leading the course in November 2024, to be followed by a further course in May 2025 organised by Nankhunda Transformation. This will allow at least a doubling of those trained in this 'soil management' innovation.



The Tiyeni deep-bed method is as follows: 1. dig to at least 30 cms depth [‘double-dig’] & remove any large stones. This is hard physical work so best done in a team [*see above left*]. The value of this is that it allows much better root penetration, increased water infiltration & improved growth of crops; 2. the dug ground is divided into 1 metre wide level planting beds separated by 40 cms deep water retention trenches so that any rainwater is kept on the plot [*see above right*]; 3. At the same time as 1 & 2 a ditch & contour ridge is made so that surface runoff from higher ground does not wash over the beds. This ridge should be planted with vetiver grass to strengthen that ridge against soil erosion [*see below left*]; 4. the planting beds should be enriched with compost-manure. This is best done a month before planting, but as this had not been done previously compost was added at this stage; 5. any large stones in the soil are placed at the bottom of the plot as an additional soil conservation measure. The plot is then left until the rains are underway, with a mulch protecting the soft soil; 6. each 1 metre wide bed can be planted with 2 lines of maize separated by an interplanted leguminous crop [e.g. soya beans]; 7. within & around the plot agroforestry trees can be planted to increase & diversify food production on the plot as well as giving additional protection against soil erosion.



During the November training course the 20 trainees were divided into 5 teams of 4 each. For the first two days the whole group produced 27 planting beds. For the next 4 days the 5 teams separated and constructed a small patch of deep-bed farming on each of their farms [see above right, which is one of the sets of beds produced by the Nsanama team]. These individual patches contained at least 3 planting beds, and usually 4. The confirmation that all this work has been completed is not available at the time of writing, but the expectation is that there are now more than 100 ‘Tiyeni-type’ planting beds, with accompanying trenches, in the Nankhunda community. That sounds like success, but we need to wait until the maize harvest in May to properly assess the value of this method.

The week after this Nankhunda improved soil management course, a similar course was held at a neighbouring village. That action is not part of this project so it will not be discussed here. However, two members of the Nankhunda Transformation team attended and undertook much of the course leadership. Thus, SGG believes that local community leaders should be able to organise similar training to take place in May 2025, so local farmers will be introduced to this innovation at a much faster rate.

KITCHEN GARDENS

Increased horticultural production in the Nankhunda locality offers the opportunity to increase overall food production on a small-scale farm [i.e. half an acre or less], to provide a more varied diet and thereby raise local nutritional standards, and also to offer new opportunities for commercial sales. The initial strategy used to promote horticulture has been the establishment of two model demonstration kitchen gardens. This was followed by members of the Nankhunda Transformation team who had experience of establishing such gardens being encouraged to introduce biointensive double-dug raised beds among interested farmers.



Photos taken in January 2024 show that this was a steep, rocky, and largely wasted space, but when the Nsanama garden [see above left] was visited on 26th November it was flourishing. The garden contains 10 bananas, 1 pawpaw and 5 Tephrosia as well as one mango, one avocado and one citrus – 3 fruits which were planted long before the garden was established. The raised beds contained more than 50 tomato plants, rape, 5 gourds and maize. The garden has used space to develop a tree nursery with a plan to distribute tree seedlings to members when the main rains arrive in December.

A particularly pleasing aspect here is that one member has developed two small private gardens which adjoin the Nsanama women’s communal garden. Here [see above right] there are 10 tomato plants, 15 gourds & an amaranth, but the main surprise was to find a large number of strawberry plants. The neighbouring small garden was mainly used to grow pumpkins.



This kitchen garden is now nearly two years old [see above left]. When SGG visited on 26th November the rains had not properly started so some of the raised beds remained unplanted. Those which had been planted contained tomatoes, greens and a passion fruit. There were also fruits [e.g. pawpaw, mango, banana] but most of these were too young to produce fruit. There were more than 20 *Tephrosia vogelii* bushes, and members were advised to prune them in order to use the leaves for pest control and also give more space to the *Grevillea* growing along the fence.

During this visit little attention was paid to individual kitchen gardens, because farmers were more concerned to plant their maize fields before the vegetables. SGG awaits a report on progress with this community outreach but we understand that more than 50 double-dug raised beds have been established by the Nankhunda Transformation team.

SGG regards this promotion of horticulture as a very successful part of this project, and we anticipate that this type of action will increase in future projects. It is interesting to note from the Community Needs Assessment that many local farmers are looking for innovations which provide greater resilience to climate hazards [e.g. Cyclone Freddy in March 2023, the poor rains of the 2023-24 season, Cyclone Chido in December 2024]. Vegetables which can produce a harvest in 3 months represent a better adaptation to climate change than maize which requires 4-5 months to reach a successful harvest.

AGROFORESTRY

For more than a decade SGG has used tropical tree-planting as a cost-effective strategy for poverty & hunger alleviation among African rural communities where small-scale farming dominates. SGG's previous 'Tropical Tree-Planting and Conservation' project recorded 191,118 trees in the period 2019-2023 period, so it was inevitable that agroforestry actions formed a major part of this current 3-year project.

In February at the end of the SGG field visit it was noted, "*the tree count was an estimated 19,269 trees growing on 173 plots. However, only half the conservation groups have had their trees counted, so a final figure of perhaps 45,000 trees growing on about 400 plots is anticipated*". It was immediately obvious that local tree counters were needed to complete this gargantuan task, so that SGG needed to take only a sample of farms to confirm the accuracy of villagers' counting. During the November visit it soon became evident to SGG that many of the tree counts made during 2024 were unsatisfactory, so the figures cited below must be regarded as crude estimates. This suggests that it will be necessary to find a new method of tree counting in any future project. However, it should also be mentioned here that when many tree counts were double checked by SGG they proved to be accurate and acceptable as estimates.



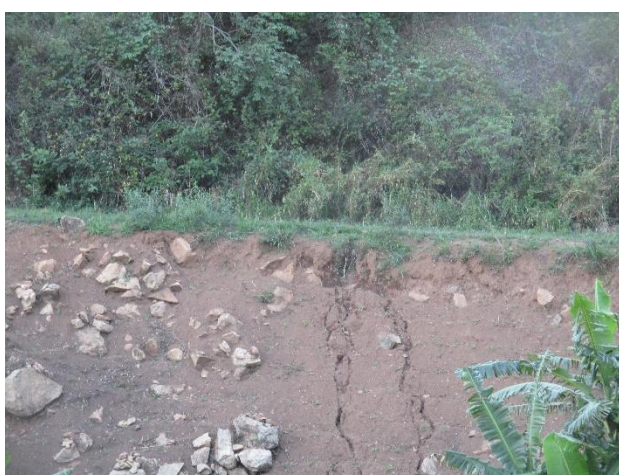
Apart from the pine plantations on the upper slopes of the Zomba Plateau [which lie outside the scope of this project], SGG would tentatively suggest that there are four patterns of agroforestry planting in this locality. On the lower ground near the villages of Nankhunda & Namadidi households are often surrounded by fruits. Here [see above left] SGG confirmed that there were more than 200 avocado & mango trees shared by seven households who are all members of an extended family. Where ground is steep or rocky woodlots are often planted with pine or eucalyptus [see above left]. Away from homes trees are far fewer. On the lower ground where soil is generally better, the open fields often have a scattering of trees, which are frequently mango [see below left]. On the middle slopes of the Zomba Plateau there are extensive open fields with limited tree cover. Here [see below right] is an example of such a slope. This photo was taken in February 2023 after good rains and when the young, green maize hides the damage being done to the topsoil. A close examination of this maize field reveals a series of rills, which are indicative of surface runoff and the inevitable consequence of soil erosion. It is these upper fields, which are dominated by continuous maize monocropping, and which are often distant from the farmers' homes, where extensive agroforestry planting is required.



It has already been mentioned that the tree counts made in 2024 are unreliable. Nevertheless, as we approached the end of this pilot project, SGG wished to have crude estimates of trees found on the farms of 3 more conservation groups. After considerable double-checking and adjustments of the original tree counts, SGG accepted that those groups had a total of at least 8,082 trees to be added to the 19,269 counted earlier in the year. As several members of these 3 groups have yet to be counted, it is likely that the actual figure is much closer to 30,000 trees. Furthermore, as some new groups have joined Nankhunda Transformation in 2024, SGG's earlier prediction that there are already some 45,000 agroforestry trees planted still appears to be reasonably accurate.



These 4 photos show why tree-planting along the contour are so important for soil conservation. The photos were taken in December 2024 within 1 hour of each other as the evening light was fading. One photo [see above left] shows typical upper farmland below Zomba Forest Reserve. Trees are scattered, except along a small stream at the bottom of the valley. Despite the ridges prepared for maize planting fieldwork shows much evidence of soil erosion. There is one small area where the planting of parallel lines of trees is maintaining soil stability [see above right]. At the bottom of this plot there are bananas planted along the stream. Above that there are 4 lines of trees, which include fruits [mango, guava, avocado & some banana] as well as the agroforestry species *Senna spectabilis* and bamboo, to hold the soil in place. Some 30 metres to the left of that plot [see below left] the slope is without trees and is marked with parallel rills, which are a sure indication of surface runoff and soil erosion. On the opposite side of this small valley [see below right] there is a conservation area where forest is being restored above the road. There is no sign of surface runoff and erosion there. However, below the road the steep slope has been cleared of trees for cultivation. The consequence is clear: surface runoff & soil erosion, which will continue until the slope is just a mass of stones.



The farmlands around Nankhunda & Nsanama villages require hundreds of thousands of trees planted if precious soil is to be conserved. On the grander scale, Zomba District needs millions of trees. This is one reason for agroforestry planting being the major budget item in any future project.

One problem with such tree-planting is that it takes a few years for the root systems of trees to develop so that effective soil conservation is achieved. With this in mind SGG is promoting vetiver grass as a temporary alternative, and it is pleasing to note the increasing use of vetiver in this locality.

FOREST RESTORATION

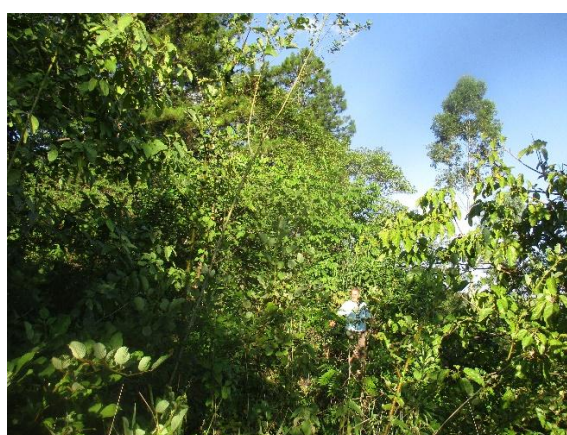
ZombaTREEZ, in partnership with Nankhunda Transformation, have been organising local village groups to take care of designated ‘conservation areas’ within the Zomba Forest Reserve well before the establishment of this project. See www.zombatreeez.com for details.

These community groups maintain their designated areas by suppressing any wildfires and clearing their areas of weeds, particularly the ‘stranglers’ [e.g. buffalo bean, mulungusi, lantana] which can suffocate young tree saplings. These actions allow trees to grow by natural regeneration. This strategy of natural regeneration of trees is of significant interest to SGG because in some locations it may be a more efficient way of restoring African tree cover than simple tree planting.

As indicated in earlier reports SGG is more concerned with agroforestry on villagers’ farmland rather than forest restoration in the Forest Reserve. During the November 2024 field visit there was insufficient time to draw detailed conclusions about this action. However, it was inevitable that I would pass by some of the conservation areas and be able to make casual observations.



These 4 photos taken at the same location indicate the pace of forest restoration based on natural regeneration. The partial clearance of this site in January 2020 provides the start point [see above left]. The next photo [see above right] of the same site was taken 4 years later in January 2024. The lower two photos were taken in December 2024. At this time the conservation group Happy Hammers had not yet done their bi-annual maintenance, so it was difficult to find the precise place of the January photo, but these December photos were less than 5 metres apart. Note the eucalyptus in the background which can act as a marker. SGG’s view is that such restoration is an effective strategy, especially as it provides significant seasonal income for the villagers.



There is one more issue concerning the forest restoration in this locality which deserves repetition. One difficulty with such ‘conservation areas’ is that the land is not owned by the village community but by the government ministry responsible for forests. Therefore, villagers are sensitive to the fact that government authorities could decide to turn these conservation areas, where indigenous species predominate & where villagers can earn casual seasonal employment, into a more immediately profitable use, such as a monocropping pine plantation. In fact, most of the upper slopes between ZFL and Zomba town are either pine plantations or excellent examples of badly degraded forests where tree cover is often below 10% of the terrain. This matter of ownership and control of these conservation areas is a crucial issue to be settled if Zomba’s degraded forests are to be rapidly restored. If the Malawi government wishes its people to take more positive action to restore Malawi’s tree cover, that government needs to be prepared to hand over both management and ownership of forests to interested local communities. Thus, I am pleased to report that there are now some initial discussions about these conservation areas becoming a ‘community forest’. SGG would approve of such a development.

FUTURE PROSPECTS

The various activities described above have all been implemented successfully elsewhere in a series of projects which have been ongoing for at least a decade. A significant part of SGG’s thinking when developing a partnership with ZombaTREEZ and Nankhunda Transformation was to see if all these activities could be implemented in a single comprehensive programme in Malawi. After three lengthy monitoring visits in Zomba District, SGG now believes those various activities have been successfully implemented here around Nankhunda. This means we have a suitable model for ‘community development through environmental improvement’ which is appropriate and replicable not only elsewhere in Malawi but also in many other locations south of the Sahara.

What has been considered throughout 2024 is, ‘What is the best strategy to upscale this pilot project in order to achieve greater social, economic and environmental impact?’ Concerning this issue, prospects look good. The Rotary Club of La Haute Vallee de l’Aude in France is currently developing a project partnership with Limbe Rotary Club in Malawi, with the intention of applying for a Rotary Foundation grant in the near future. Such a grant should enable the various stakeholders to double their actions and impact during the 2025-2028 period. One of the requirements for the above grant is that La Haute Vallee de l’Aude Rotary Club and friends raise approximately \$35,000 as their contribution to the proposed new upscaled project. At the time of writing a full list of pledges is not available to me, but SGG estimates that the various pledges now reach about \$30,000. Thus, prospects look good for a much larger community & environmental project which can hopefully start in 2025.

Paul Keeley

SGG Managing Director

19th December 2024