PROGRESS REPORT ON SGG-ZOMBATREEZ PROJECT

INTRODUCTION

After the successful implementation of both horticultural & agroforestry projects in East Africa, Sustainable Global Gardens, in partnership with Zomba Forest Lodge, helped launch similar projects in the vicinity of Nankhunda village, near Zomba in Malawi. This project partnership started in late 2021, so it is now in its second year from October 2022 to October 2023. This report summarises progress monitored in early 2023, and also suggests a likely budget required to complete this 5 year programme.

The report refers to three main actions:

- forest restoration on degraded forest land around Zomba Forest Lodge [ZFL]. This was initiated by ZFL and has been implemented for several years, so SGG's role here is to provide additional funding and monitor progress;
- provision of training in agricultural innovations appropriate for small-scale farms;
- establishment of a series of demonstration gardens

CONTEXT

Malawi is a peaceful but economically poor country. In the U.N. Human Development Index [HDI] it is ranked 169th out of 191, with most countries below Malawi either locked in political instability/war or located in the Sahel. It is estimated that some 70% of the local population are living on less than $2.15/day with the majority of the rural population engaged in 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 World Bank data [see www.worldbank.org/en/country/Malawi/overview] mentions the following:

- in 2022 expected economic growth was projected to be 0.9%, compared to 2.8% in 2021;
- the year-on-year inflation rate was 26.7% in February 2023, with a sharp rise in the price of basic foods including maize during the previous twelve months;
- the Reserve Bank of Malawi devalued the Malawi Kwacha against the US dollar by 25% in May 2022;
- 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;
- such figures show the consequences of climatic shocks, both unseasonal drought and tropical cyclone damage, low agricultural productivity and slow structural transformation.

The above figures illustrate the national economic context at the time of SGG's first field visit to ZFL and Nankhunda village in Zomba District. They do not take into consideration the severe disruption to life and the economy caused by Cyclone Freddy in March 2023.

At the same time the population of Malawi is increasing at 2.6% per annum, which means that the country's population will double in a generation, thereby hugely increasing the pressure on land and soil resources. This is reflected in the widespread deforestation and environmental degradation. Furthermore, as an inland African state with very limited mining & manufacturing opportunities, Malawi must rely on environmental improvements in rural locations to bring progress to the majority of its population.

INITIAL PROGRESS

Before the ZFL-SGG partnership was established in 2021, ZFL had already been active with the implementation of a forest restoration scheme. Such work has continued within this five year programme, but since 2021 there has been increased attention paid to community development. By 2023 this has included the establishment of a horticultural demonstration plot, and agricultural improvements based on the Tiyeni deep bed farming method. See www.tiyeni.org for details. The first of these community actions was the **Tiyeni training** which started in October 2021.

The basic feature of Tiyeni farming is a much deeper turning over of soil than is traditionally practised in Malawi. The tilled soil is then arranged into a series of ridges and shallow ditches which follow the contours lines. This system breaks the sub-soil hardpan to improve root penetration, and also reduces surface runoff and soil erosion. The ditches improve on-site water retention and availability of water for crop growth. It is not surprising that this improves harvest yields and also encourages a greater variety of crops to be grown. Here [see above] are farmers from Nankhunda being trained in Tiyeni deepbed farming. How successful is this method? It is difficult to be precise about this based on evidence from Nankhunda village as the locality suffered from both failure of the rains and then cyclone damage after the training. However, the Tiyeni plots visited by SGG in January 2023 had much healthier maize than their neighbours *[see below right]*. In SGG's opinion the main limitation of this training was that only 20 farmers followed this training course, when there is a need for thousands to be trained. During SGG's January fieldwork midway through the rains, far too many fields had maize less than 0.5m high *[see foreground in left photo below]* with harvest failure almost certain.

Based on SGG's observations in Nankhunda, the Tiyeni farming method is a definite improvement on traditional tillage methods in that locality. As such more training is needed, but the current arrangement of training one cohort of 20 farmers each year is too slow to introduce this agricultural innovation to the majority of local farmers in the next few years. A new arrangement for spreading this technology is needed. SGG hopes that the Tiyeni manual, to be published online in 2023, will facilitate this change of arrangements.

The second community action was the establishment of a **demonstration kitchen garden in Nankhunda village** in January 2023. Here the training was undertaken by SGG, who believe that food security and poverty alleviation South of the Sahara depends largely on small-scale farmers adopting intensive horticultural practices rather than continuing with traditional low input methods.

Here we are trying to produce 10 double-dug raised beds. The method used includes : a] mark out a series of rectangular beds. These are usually 4-5 metres long but sufficiently narrow that you can lean over from one side to the other and never walk on the bed; b] dig out a trench c20 cm/one hoe strike deep + remove the soil *[see above left]*. Then double the depth of this trench. This is 'double-digging' in order to break up the consolidated sub-soil; c] the deepened trench then is partly filled with compost mixed with soil. This action is continued until the other end of the bed is reached. This is hard, physical toil, especially where there are rocks or a hardpan in the soil. It took 2 men all morning to prepare one bed *[see above right]* and we were all fatigued by midday. As the compacted soil was now well aerated and 3 bags of organic material were added to each bed, the final result was a vegetable bed significantly higher than the level of the surrounding ground – hence raised beds *[see lower left]*. During the second week vegetables were planted in the beds, and trees around and between the raised beds *[see below right]*. The last task was the construction of a local fence made mainly of freely available bamboo and grass. The vertical posts were made of Pterocarpus angolensis ['bloodwood'] which should provide the basis of a living fence.

The above demonstration kitchen garden has several features which differ from the surrounding village land use. These include:

- an avoidance of maize. Although maize provides Malawi's staple food, it is SGG's view that too much emphasis is placed on this crop, particularly in situations where farmers practise continuous maize monocropping and harvest inadequate yields. A simple 'rule of thumb' piece of advice from SGG is that farmers should have at least 10 different 'products' available on the farm plot;
- growing several vegetables in the raised beds [e.g. tomatoes, onions, indigenous greens etc] to improve nutrition, especially for children;
- making the kitchen garden an 'agroforestry unit' with scores of trees, all of which are useful to the farmers family;
- suitable tree species include fruits [ie. bananas, mango, avocado, pawpaw] to improve the local diet and also provide something for commercial sales. The kitchen garden also has the multipurpose Grevillea robusta planted around the periphery, and some indigenous species [Albizia, Faidherbia albida] which provide fodder, shade, as well as being soil improvers;
- planting Tephrosia vogelii for natural pest control.

One important feature is currently missing from this demonstration plot, and that is compost. The surrounding villagers have limited livestock, and purchasing manure for the raised beds proved to be a major expense. The initial plan was to include two large compost heaps within the kitchen garden, but there was simply insufficient compostable material to do so. The team of 6 volunteer gardeners were asked to collect suitable material during the whole period when SGG is absent. According to Stephen Carr, [a local resident who is a retired World Bank agriculture specialist], buffalo bean, which is an invasive weed in the degraded forest areas around ZFL, makes excellent compost. The other advice is for farmers to resist the traditional practice of burning to clear fields before planting.

The other limitation of the kitchen garden is that it provides a demonstration plot for Nankhunda villagers only. Other villagers in contact with ZFL need to have a similar demonstration plot nearby, so it will be necessary to establish a new garden each year during the remaining part of the programme.

The third aspect of this ZFL-SGG partnership is the promotion of **tree-planting and forest restoration** work. Initial discussions in 2021 had suggested that both the farmland and forests around Zomba offered great opportunities for forest restoration and agroforestry. Furthermore, SGG had a particular interest in seeing whether natural regeneration or 'rewilding' is an appropriate strategy within the Southern African context, so initial funding for such schemes was sent to ZFL in 2021-2 before SGG's fieldwork in January 2023. During that four week visit about half the time was spent monitoring tree-related activities. 96 sites were visited for tree counting and an estimated 22,509 trees recorded. SGG regards this figure as a significant underestimate. Some of the 'conservation areas' where natural regeneration was underway were not counted [e.g. Hyena Rock, the Happy Hammers area, Umwozi Youth Group area etc] as clearance of weeds had not taken place by the time of SGG's visit. Furthermore there are probably about 100 farms where agroforestry trees have yet to be counted. Thus, the four weeks spent at Zomba Forest Lodge proved to be insuffient for a full tree count, especially as some 10 days out of the month were occupied with horticultural activities and visits at Thondwe. We were fairly confident in February that a full tree count would produce a minimum of 30,000 trees. In support of this view ZFL have sent SGG an estimated tree count of 28,044 this May with some conservation groups and all the farmers still to be counted and paid. In view of this latest update, SGG is now expecting a full tree count next year to be above 40,000 trees either planted or growing by natural regeneration.

There were 2 types of tree counting done around Nankhunda village. One was agroforestry planting on individual farms with 7,964 trees counted. Such trees were often densely planted around households *[see above left]* but lacking on more distant fields. The second type *[see above right]* was counting in 'conservation areas' where reforestation was mainly based on natural regeneration, some spot-planting of indigenous species and fire prevention during the dry season. This accounted for 14,545 trees. From the perspective of poverty & hunger eradication, more agroforestry planting is needed, but natural regeneration improves biodiversity and provides better long-term environmental resources.

How successful is natural regeneration compared to simple tree-planting? The photo on the left shows members of the Happy Hammers sports club clearing land in January 2020. The photo on the right shows the same area three years later. On the basis of these photos and several other plots around Zomba Forest Lodge, I think that natural regeneration is an excellent and badly needed strategy, especially in areas of mountainous terrain where extensive slopes have been cleared of trees. However, to be fully successful this type of regeneration requires regular clearance of weeds, probably 3 times a year. This requires much labour & community participation, but it also offers villagers the opportunity for additional income in what is a semi-subsistence economy. Another aspect is the need to reduce pilfering of wood, perhaps best done by greater use of stoves which require much less fuelwood. There is also the need for spot-planting to introduce and care for slow-growing indigenous species to create greater biodiversity in the new forests. SGG considers that there are two other elements necessary if this type of natural regeneration is to succeed in the African context. One is that government authorities need to shift from a traditional timber-extractive approach to forestry to a policy which considers the long-term value of forests in terms of carbon capture potential, greater biodiversity [a tourism asset], and security of water supplies. The other requirement is that local communities have stakeholder 'ownership' of the forest, to be developed for their benefit.

There are two improvements which could be implemented fairly rapidly around Nankhunda. Here *[see above left]* two neighbouring farmers have agreed to leave a rocky area between their farms as a small conservation 'copse' of about 250 trees. SGG will pay these neighbours a small fee to maintain this type of land use. Around this village there are several other similar copses, where biodiversity could be maintained on land ill-suited for farming and where farmers would appreciate additional income. Where the forest has not been cleared *[see above right]* recently there is considerable scope for carbon capture. This particular forest already has sponsors willing to give an additional small income on the proprietors' assurance that these trees will not be felled in the next 10 years.

Monitoring the various reforestation and agroforestry activities around Zomba Forest Lodge would require far more time than was available to SGG in 2023. What is clear from SGG's observations is that this locality has great potential to be an outstanding example of community led reforestation in a country which is rapidly moving towards a lack of timber, fuelwood for domestic energy, and a biodiversity sufficiently attractive to tourists. Whether this potential is achieved in the next few years depends largely on ZFL, in partnership with Nankhunda & other village organisations, gaining concessions from forestry authorities to manage local areas of forest for the benefit of the local community. The current situation is that ZFL has applied for a concession to manage an area of degraded forest under the 'Adopt a Forest' scheme, but this has not been granted yet. In view of the damage to life, the local economy & environmental resources caused by Cyclone Freddy in March 2023 SGG hopes that this forest concession is speedily granted. Furthermore, it is SGG's assessment that if such a concession was granted the restoration of hundreds of hectares of currently degraded forest could be achieved with direct benefits to thousands of local villagers.

With reference to the above schemes, SGG's current plan is to return to Zomba in 2024 with the following fieldwork aims:

- to monitor the impact of the second training by Tiyeni,
- to establish another kitchen garden demonstration plot at a village near to but separate from Nankhunda,
- to monitor work done by the volunteers at the Nankhunda kitchen garden demonstration plot to propagate biointensive methods & permaculture among neighbouring Nankhunda farmers. This action requires a year-long campaign which promotes composting,
- to check progress concerning the adoption of agroforestry tree-planting by farmers in Nankhunda village. This action requires core members of the Nankhunda Transformation Group to establish a tree nursery with at least 2,000 seedlings and a variety of tree species,
- to continue the tree count of woodlots, copses, and concession areas where natural regeneration and spot-planting are being used to maintain tree cover. It is anticipated that this action will take at least one third of the time available,
- to increase the number of farmers who are participating in SGG's carbon capture scheme.

ESTIMATED BUDGET

During SGG's initial discussions with ZFL in 2021 it seemed that the fundraising of £20,000 for a five year programme would provide the financial basis for a successful project. During SGG's field visit in January-February 2023 it became clear that there was more community support for all of the above-mentioned projects. In particular the forest restoration work could be greatly expanded. At the same time there is now official encouragement at Malawi governmental level for communities to 'Adopt a Forest' in order to reverse decades of deforestation. With this in mind, SGG wishes to upscale our commitment to this project and to raise funding of £30,000 to be entirely invested in Zomba District over the 2021-2026 period.

There are uncertainties about the climatic conditions, the social changes, the political decisions which will impact on Zomba District in the next few years, so financial budgets must also remain an area of uncertainty. However, the following estimate is what we think SGG needs for the full 2021-2026 period to ensure measurable and significant progress:

- £3,600 for Tiyeni training of 80 farmers;
- £2,250 to establish 3 kitchen garden demonstration plots which illustrate fruit & vegetable growing using permaculture & agroforestry methods;
- £4,800 to facilitate the adoption of kitchen gardens using the above methods to construct up to 300 double-dug raised beds for biointensive vegetable production. This will be offered to all the members of the various community environmental voluntary groups within the participating villages. Each double-dug raised bed will have an anticipated cost of £16/bed, which includes renumeration for the workers, cost of compost and tree seedlings to be planted around the vegetable beds;
- £8,000 to facilitate forest restoration work. This figure is based on a counted target of 40,000 new trees, either planted or growing naturally by rewilding in the Zomba Forest area. These funds will be used as a one-off payment to the various groups with responsibilities for weed clearance & tree care. Such payments are made as renumeration for what is often hard, physical work. It can be considered as payment for environmental services provided. As there are more than 200 members of these voluntary conservation groups, this funding can provide only an occasional and supplementary income for these community volunteers. ZFL are already undertaking this action, and they will be responsible for any further payments. The £8,000 is SGG's contribution to this work;
- £1,000 to be reserved for carbon capture actions either within well-established conservation areas or if feasible within smaller woodlots which belong to individual farmer households;
- £8,000 for agroforestry planting on agricultural land. The anticipated costs average 25p/seedling so the planting target is 32,000 trees – all of species useful to the farmer household;
- £750 for contingency purposes;
- 5% of the total of the above [£28,400] for general administrative purposes [£1,420];
- So the estimated budget for the full 5 year programme £29,820. This represents an average annual expenditure of fractionally less than £6,000, which will provide additional income and employment to hundreds of rural households in one of the poorest countries in the world.

At the time of writing SGG has already raised £13,220 towards the above total. This represents 44% of our expected expenditure. We are therefore requesting further donations which will enable this project to be successfully completed.

Paul Keeley
c/o Sustainable Global Gardens 15th May 2023