

# SGG REPORT TO THE SUSTAINABILITY TRUST

## PREAMBLE

In 2012 a donation of £500 was made by The Sustainability Trust [TST] to Sustainable Global Gardens [SGG] in order to encourage tree-planting in the Kilimanjaro region. A further donation of £360 was made by Harrogate R.C through the TST for the same purpose. Members of TST are aware of well-publicised shrinkage of the Kibo summit ice cap, which has been reduced in size by approximately 85% over the last 100 years.



*I took the left photo of Kibo Summit in 1972 from Kibosho. The photo on the right was taken in October 2015 from Upendo Childrens Home in Moshi. What is clear from these photos is that much of the ice visible in the 1970s is now no longer there, and at recent rates of melt the ice cap will entirely disappear in the 2020s. What is the cause of this ice shrinkage? Some have blamed global warming. SGG's view on this matter is that the climatic data evidence for global warming is now overwhelming, despite the recent two decades when the increase in temperature has been less marked. However, some studies indicate that prevalent air temperatures over East Africa at altitudes of 5-10,000 metres have not increased in recent decades. This evidence has shifted the focus of interest towards increased regional aridity associated with widespread deforestation in East Africa. The cause may be global warming, but deforestation seems to be a more direct influence. Thus, tree-planting seems to be an obvious long-term solution to this environmental problem.*

*At this point it should also be remembered that trees provide many other benefits to the local population. Trees will reduce the dangers of soil erosion, increase soil moisture retention, act as a windbreak, provide a source of energy in rural areas where hydrocarbons are too costly, provide a cheap source of fruit, medicine etc as well as being a significant income for small-scale farmers. SGG's field experience in Kenya suggests that tree-planting and agroforestry is one of the best strategies for poverty eradication in African communities where small-scale farming is the main source of livelihood.*

*Thus, SGG's two major projects involve tree-planting and we are constantly looking for people & institutions who wish to support an increase in tree cover within East and Southern Africa.*

It is worth mentioning at this point that the disappearance of the Kibo summit ice cap could herald environmental and economic disaster for the Kilimanjaro region. For centuries the Chagga people who live on the lower slopes of the mountain have taken advantage of the year-long supply of water, which has come from the continuous but slow melting of ice and snow near the summit. That gradual melting has generally been balanced by a gradual accumulation of ice, and field studies on Kibo summit suggest that the ice cap there is at least 11,000 years old. The presence of this ice cap has enabled the local farmers to develop intensive cultivation based on 2 or even 3 harvests per year, whereas most farmers in Northern Tanzania who rely on seasonal rains for cultivation are far less productive. If the Chagga had to rely solely on rainwater for their farming, agricultural production in this region would be significantly reduced.

For many years this potential environmental catastrophe was ignored. Indiscriminate deforestation and burning to provide land for cultivation, to support charcoal commerce and to provide commercial timber has been evident in nearly all areas of Northern Tanzania visited by the writer. However, during the last decade there has been much greater concern about tree-felling as the consequences of soil erosion, desertification, the drying of permanent streams as well as the undisputable shrinkage of the ice cap on Kibo summit are there for all to see.

Official policy concerning trees has also developed to deal with an environmental problem which affects the whole of Tanzania. The government are encouraging tree-planting wherever the community is willing to implement such action. The issue for The Sustainability Trust to consider is whether or not TST and the global Rotary community are able to make a significant contribution to the extensive reforestation which is needed in North Eastern Tanzania. Part of the answer to that question is concerned with the issue of whether or not Rotary clubs located in the Arusha, Kilimanjaro and Tanga regions of Tanzania are capable of implementing significant tree-planting projects within their own local communities. This report will provide some field evidence relevant to this latter question.

## **INTRODUCTION**

This report is based on a visit by SGG directors Paul and Carole Keeley to Rotarian Faye Cran of RC Moshi. In 2013 Rotarian Faye had been asked to disburse £500, which had previously been donated by The Sustainability Trust to those Rotary Clubs in the Kilimanjaro-Arusha area who wished to engage in tree-planting but who were short of funds to do so. SGG implement tree-planting programmes on the basis of the average seedling costing the equivalent of 20p, although we are aware that such seedlings are generally more expensive in Tanzania than in Kenya. Thus, our expectations were that it would be possible to plant at least 2,500 with the donation given.

Rotarian Faye added significantly to the funds from TST. She reported that 2,000 seedlings were distributed to Machame RC, a further 2,000 to RC of Tengeru, 500 to Same RC, and approximately 1,000 given out to the general public. No funds were given to R.C Rombo Mkuu, who had received a previous donation to promote tree-planting. The task for SGG in October 2015 was to count/monitor the trees planted by these Rotary clubs, and thereby evaluate the success of this project.



*The main activity during this October 2015 visit has been the counting of trees. In the top left photo SGG director Carole Keeley is recording trees in Dr Kwayu's banana shamba. Tree-counting usually requires the help of those who planted the trees, and this gives an excellent opportunity to chat to our Tanzanian partners. In the top right photo I am discussing I do not know what with pupils from Mlangarini School. The lower left photo shows some of the many trees which have been planted at Mlangarini. I spent one day counting trees distributed by Tengeru RC. Throughout that day I was very ably assisted by Loki: it was a pleasure to work with him. In the lower right photo he is holding one of the several hundred *Grevillea robusta* which we counted that day.*

## **SAME ROTARY CLUB**

RC. Same received some 500 seedlings, we think. SGG had many commitments in Kenya and too tight a schedule to allow a visit to R.C. Same, so it was decided to reserve some funds for the club and wait until February 2016 when there would be sufficient time to allow a proper visit.

## TENGERU ROTARY CLUB

On Saturday 10<sup>th</sup> October SGG were assisted by Rotarian Robert Mlugu [tel. +255 755041920. email: [mojifamojifa@yahoo.com](mailto:mojifamojifa@yahoo.com)] to view some of the club's tree planting in recent years. Our main findings were:

- Farmer Elipokea Meing'ali [0759121232] in Ambreni village has a riverside shamba which includes a steep slope unsuitable for cultivation and a small plot around the house at the top of the slope. He had received 200 seedlings. We counted 125 Grevillea + 10 Markhamia lutea on the slope, which was sufficiently steep to be a hazard. On the plot at the top of the slope there were more than 50 small Markhamia, some of which Elipokea will try to transplant onto the riverside slope, as well as another 9 Grevillea. We also noted 7 fruit trees, 2 jacaranda, some mujohoro, and mwarobaini nusu;
- Lilian Olosiritore [0758086834] has a shamba close to Longange Secondary School in Shangarai village. She received 100 seedlings from Tengeru RC. Within the shamba we counted 68 Grevillea, 5 other trees, and 5 fruits to give a total of 78 young trees. Severe drought was given as the main reason for the failure of some of the Grevillea;
- We then visited Longange Secondary School, who had also received trees according to Robert. Along the perimeter wall of the school there was a line of Grevillea which had clearly been planted about 3 years ago. Robert had arranged to meet the Deputy Head who would show us round the trees. However, when we went to greet the Head he was most impolite and critical. After some unpleasant discussion I rescued a very embarrassed Robert by saying that if the Head did not wish us to visit and count the school trees we would not do so. Only at this point did the Head realise that I spoke poor but adequate Kiswahili, and that I understood what he had said. We left without further ado. This was the only example where traditional Tanzanian greetings and hospitality were not given to us, and where we received a negative response;
- Our next visit was to Mlangarini Secondary School where we were met by the Head, Bw Elisa Pallang'yo [tel. +255 767466731. email: [ejopall@yahoo.com](mailto:ejopall@yahoo.com)], and where we received a very different reception. An SGG team had visited Mlangarini in 2012, and it was immediately clear that an improvement since then had been made in this very dry locality. We counted 679 trees. There were many different species, but the majority were mujohoro - one of the few species to withstand the long droughts of this area. This is a large school with 1100 pupils and large grounds which could support more than 1,000 trees. SGG thinks it important to encourage tree-planting in what could become a model school for this area;



- The current President of Tengeru, Margaret Kiuya [tel. +255 753689698] has a plot on nearby Mama Ndoki Hill which has been planted with 250 Grevillea, pine and cypress. Once again this is a steep slope where cultivation is liable to lead to soil erosion, so a woodlot is a good use of this ground. We counted 208 trees. At the top of this plot there is a path and Margaret's worker reported that many trees planted near that path had been stolen. This is a common problem in the context where farmers want trees but are not yet prepared to pay for them. Thus, we should not assume that the 42 missing trees are not flourishing in neighbouring fields. We have suggested to Tengeru RC that in future they reserve some 10% of their planting stock to be given away to neighbours in the hope of reducing this type of loss;
- RC. Tengeru have distributed a large number of trees to farmers & schools which we did not have time to visit, so we asked President Margaret and Rotarian Robert to check on how many of the trees donated by Tengeru have survived;
- The above information was collected on Saturday 10<sup>th</sup> October. When we passed through Tengeru on 16<sup>th</sup> October Paul had a further opportunity to check trees. The following received trees distributed by Past President of RC. Tengeru, Bw Gabriel Kaaya [tel. 0784773977 or 0755860477. email: [gabrielkaaya@gmail.com](mailto:gabrielkaaya@gmail.com)];
- There are 7 trees, including 2 mangos in the Keith Stanton Primary School yard;
- Bw Tall was given 40 grevillea, and we counted 39;
- Bw Langaeli was given 50 Grevillea, and we counted 49;
- Bw Swai was given 20 Grevillea, and we counted 14;
- Bw Zacharia was given 20 Grevillea, and we counted 17 with an additional 2 Markhamia. A high proportion of these Grevillea were planted near the streams in this locality in order to reduce riverbank erosion;
- Gabriel Kaaya was given 60 Grevillea, and we counted 48;
- Thus, on 10<sup>th</sup> & 16<sup>th</sup> October SGG counted a total of 1287 trees planted using the TST donation. There are some Tengeru RC members we did not visit as well as the trees at Longange, which we did not count although there were clearly visible. With this in mind, SGG thinks that this is an excellent effort by Tengeru RC. Rotarian Faye and SGG have decided to award the club £150 from RC Harrogate's 2014 donation towards tree-planting in Northern Tanzania.

This is not the only tree-planting work around Tengeru. Rotarian Robert Mlugu is Director of a local NGO called Moivaro Jitegemee Family [MOJIFA]. This is a group of 56 farmers around Ambreni village, and the aim of MOJIFA is to promote organic vegetable production, agroforestry, and improved poultry keeping. The records in MOJIFA office suggest that the group has distributed more than 15,000 trees in the last 3 years. MOJIFA is the type of small, local NGO which SGG would like to financially support if funding becomes available in the future. We believe that such 'grassroots' organisations can often give better results than larger institutions.

## MACHAME ROTARY CLUB

On Sunday 11<sup>th</sup> & Monday 12<sup>th</sup> October SGG visited Machame Rotary Club [email [rotmachame@yahoo.com](mailto:rotmachame@yahoo.com)] where we were met by the current president, Raymond Uronu [Tel:0787566614, email [damascusuronu@yahoo.com](mailto:damascusuronu@yahoo.com)]. We were taken to a small hospital in Machame where we picked up Rotarians Dr Kwayu [email [msifuni2000@yahoo.com](mailto:msifuni2000@yahoo.com)] and Mr Ram [Hai Green Initiatives email [2013hagi@gmail.com](mailto:2013hagi@gmail.com)]. They advised us to check out Byrd Polar Research Centre who are interested in environmental education, especially climate change mitigation & carbon sequestration. They also mentioned Sustainable Land Management and Hai Green Initiatives which was set up by Mr Ram. They took us to the following sites:

- Bw. KIRAMU's farm where 300 trees were given out. We counted 5 acrocarpus (known locally as 3 minute tree as it grows very quickly) and 298 grevillea giving a total of 303 trees. These had been planted on a single plot interspersed with existing banana plants;



*Club President Raymond Uronu counting Grevillea in Bw. KIRAMU's shamba [see top left]. Very often Grevillea are grown in a banana shamba to provide shade & leaves for mulching for the bananas. Another type of planting is the riverside woodlot where it is difficult to give accurate tree counts [see top right]. Such woodlots are primarily to reduce soil erosion on a steep riverside bank and also to become part of a riverine forest which will help stabilise water flow. RC Machame are encouraging the restoration of the riverine forest near Nshara bridge [see bottom left]. And here are the difficulties of accurate counting: dense vegetation and steep slopes [see bottom right], but an excellent and encouraging visit to Machame.*



- Dr J Kwayu's own plot where we counted 47 mzizi, 24 avocado, 60 grevillea 55 acrocarpus, 3 mangos and 21 various other unknown species, giving a total of 210 trees. Again these were grown among banana plants;
- Our next visit was to a small woodlot near Makoia stream. Counting in this dense and tangled vegetation was difficult, but we estimated that there were at least 100 trees in this small plot. Of course, many of these small trees will never grow to maturity as a few will outcompete the others, but the dense vegetation is very suitable for this riverside location. This woodlot is part of a bigger tree planting scheme, where Machame RC are working with a local CBO called Hai Green Initiatives. This scheme started in 2011 and has planted 89,000 to date along a 5 km stretch of the river. Before these trees were planted the stream dried up every year at about this time, but now there is a covering of high trees and a stream with flowing water. This field evidence strongly suggests that environmental damage is reversible if sufficient members of the community take action;
- Near Nshara bridge trees were planted on the river bank. We saw some mzizi 5-6 metres high less than 3 years after planting. Here we counted 50 trees to be included in our survey;
- Raymond Uronu is the current President of Machame RC. He has a small plot away from his home where we counted 26 grevillea, 4 avocado, 2 mzizi and 1 unknown tree – giving a total of 33 trees;
- On 12<sup>th</sup> October we then visited Mr Rumisha Kwayu and counted 39 mzizi near the riverbank. These were part of the 89,000 trees riverine forest project. Now that these riverbank trees provide an additional biodiverse habitat monkeys and hornbills are seen in the area again. We saw both of these on our brief visit. Within the neighbouring banana shambas we counted an additional 269 trees. These were a mixture of species, but mainly Grevillea;
- Harambee Secondary School was our next visit. This school has large grounds and could support many trees. We counted 158. However, construction work is in progress at present, and this has resulted in some recently planted trees to be destroyed. We also noticed that many trees had been damaged by pupils breaking off twigs & branches. Schools have good potential as tree-planting sites, but a certain discipline among pupils is also required. On one side of the school there is a steep bank going down to the river. This would make a good site for further planting;
- Msifuni Kwayu had 83 trees around the home and a woodlot of approximately 70 trees on a steep slope going down to river. We estimated the total number of young trees to be 153;
- Uduru Secondary School had 70 planted trees within the school grounds. Again there is a steep slope descending to the river. SGG would encourage the school to develop a woodlot/small riverine forest on this land. At the top of the slope there is a small area of Markhamia wildings which are being allowed to grow.
- Our final visit of 12<sup>th</sup> October was to Nkwamwasi Secondary School which is a small school of 320 pupils, located in the upper part of Machame. Around the perimeter fence there were 64 trees, nearly all Grevillea;

- Total counted at Machame was 1449 trees. Once again the SGG team had insufficient time to visit all the sites where trees had been planted. We understood that many farmers had received a few trees, so we requested RC. Machame to make a full list of everybody who received trees with a record of how many are now surviving. SGG think this is a very creditable performance by a small Rotary club, so we propose that they also receive £150 from the RC. Harrogate donation.



*A common way to plant Grevillea robusta is along a property boundary to make a 'tall hedge'. This photo shows planting along the perimeter of Kwamwasi Secondary School. This is a school in need of funds for new construction. Such trees not only improve the environment & act as a windbreak, but can also be a precious source of funding as they can be harvested only 6-7 years after planting. The photo also shows Raymond Uronu, RC Machame President. SGG would like to acknowledge the considerable help and hospitality we received from this club.*

## **ROMBO MKUU ROTARY CLUB**

On Tuesday 13<sup>th</sup> October SGG visited the Rotary Club of Rombo Mkuu. This club did not receive any of the £500 donation from The Sustainability Trust, which went via Rotarian Faye Cran, but they had received a previous grant to implement a school tree-planting. This district is the location of one of SGG's first tree-planting schemes in Tanzania, and we think that it offers one of Rotary's best prospects for success with large-scale planting.

*[See right photo]. This shows part of the tree-planting work in the grounds of Huruma Primary School near Rombo Mkuu. Within these school grounds SGG counted 225 trees which have been planted in recent years. Many rural Tanzanian schools have sufficient space to plant at least 100 trees, so schools seem to be good sites to promote tree-planting. However, much depends on the interests of the teaching staff, and in 2013 it was decided to limit the current school tree-planting competition to secondary schools in the Rombo District .*





Although RC Rombo Mkuu have been tree-planting for several years, this report deals only with schools which have planted following earlier donations made by The Sustainability Trust and various UK Rotary clubs. Furthermore, this report does not include details concerning the villages Mengwe and Mamsera where there is a small tree-planting group separate from RC. Rombo Mkuu. We hope to include information on these additional schemes when we next visit Rombo in February 2016.

The main findings during our field visits on Wednesday 14<sup>th</sup> October were as follows:

- Huruma Primary has planted recently 126 trees in the main school shamba in front of the school. There are also 99 trees planted around the various buildings and along the school boundary. Most of these are Grevillea;
- The neighbouring school Boma Primary have planted 50 trees. Neither of these primary schools are part of the Rombo Mkuu Rotary schools competition. The reason for this is that when the first planting in schools was done, the primary schools in general were far less successful and interested in tree-planting than the secondary schools. Thus, Club President Dr Joachim Swai and SGG agreed to focus on secondary schools for the TST-sponsored competition. Many of the trees counted at these two schools have been planted in the last two years, which suggest that initial failures have been supplanted with more recent success;
- Nearby Kelamfua Secondary had 105 trees in the part of the school grounds visited;
- Horombo Secondary School is one of the competing schools. The Head there has made a considerable effort to plant large numbers of seedlings – a figure of 500 seedlings was mentioned – but this is a dry region where most small seedlings fail to survive the drought. The monitoring group which included SGG, Aloyce Kimario Secretary of RC Rombo Mkuu, and Horombo staff, estimated that there were approximately 300 trees surviving. The advice to Horombo suggested by SGG was: 1] to keep trying; 2] to channel any runoff from the road onto the school grounds to increase soil moisture there; 3] to grow Moringa oleifera as a drought resistant, highly nutritious tree which would benefit the local population; and 4] to plant grasses, including vettivar grass, in the ditches to halt soil erosion;
- Mlambai Secondary School is also located in the lower zone where prolonged seasonal drought is normal. It is also an exceptionally rocky site on which to build a school. Here we counted 282 trees, mainly mujohoro which survives well in this difficult habitat.



*These two photos both show the open area surrounded by school buildings at Mlambai School. The left photo was taken in 2012 before tree-planting began. The rocky terrain and open, dusty ground is clearly visible. The right photo was taken this week, and it shows how trees can transform difficult conditions and make them a more suitable environment for study.*

The other point of note during this visit to Rombo is that it was agreed to end the school tree-planting competition in February 2016. This time is particularly suitable in that SGG will be in Tanzania at that time, and also it will give some schools the opportunity to make use of the coming November rains to boost their tree-planting efforts. Rotarian Aloyce Kimario has been asked to request a report from each competing school by 30<sup>th</sup> November so that competition judges can focus on perhaps 6 of the best schools when the final field monitoring and assessment is done.



*The top photo shows Dr Joachim Swai, President of the Rotary Club of Rombo Mkuu, opening the school tree-planting competition in 2013. This was a meeting for Head Teachers in Rombo District. 25 secondary schools were invited to participate, and during our 2015 monitoring visit we had time to visit only a few of the schools involved.*

*The bottom photo shows the symbolic start of the tree-planting work. It was hoped at that stage of the project that the various schools involved would not only plant trees within their own school grounds, but also establish tree nurseries so that seedlings could be given to pupils who would then plant them at their homes. We shall know only in February 2016 whether this outreach has been successful.*



*In view of the problems of drought, difficult terrain, and other school commitments it is difficult to give an overall planting criterion for project success. However, if the total number of surviving trees is more than 5,000 SGG would feel that The Sustainability Trust has got very good value for its investment.*

Thank you to all who have given generously of their time, energy and funds to make this environmental project on the slopes of Kilimanjaro possible.

Paul Keeley

18th October 2015