SGG-ROTARY TROPICAL TREE-PLANTING FOR CARBON CAPTURE

INTRODUCTION

Sustainable Global Gardens [SGG] has been promoting tree-planting in East Africa for several years. Most of the trees planted so far have been planted on small-scale farms and have been directly useful to the farmer, such as fruits [e.g. mango, avocado, pawpaw, bananas, citrus fruits] or multipurpose species [e.g. Grevillea robusta, Azadirachta indica, Markhamia lutea, Moringa oleifera]. The main purpose of such tree-planting has been improvement of the environmental conditions & production on the farm, together with improved socio-economic status for the farming household. This work would therefore fall within Rotary's 'economic and community development' area of focus. Such work also contributes to UN Sustainable Development Goals no 1and 2, the eradication of extreme global poverty and hunger, the foundation aims of SGG. For the foreseeable future most of SGG's planting will continue to be of this type.

However, SGG has noticed in recent years that many East African farmers have become aware of the changing climate in their locality. Streams that once flowed are now dry beds. Other localities seem to be increasingly affected by erratic, unpredictable rains and flash floods. Some towns, such as Moshi, are now experiencing unprecedented high temperatures. Many in North-East Tanzania can only watch as the glaciers on Kilimanjaro continue to shrink.

Here are 2 photos of Kibo Summit on Kilimanjaro, Tanzania. They were taken at different locations but from the same direction, so they illustrate the changing state of the glaciers near the summit of Kibo. The photo on the left was taken in April 1973 when much of the upper cone was covered with ice. The photo on the right was taken nearly 40 years later. It shows that the two main outflows of ice from the summit in 1973 have been reduced to small ribbons of ice – both of which became separated from the summit source area by 2019. These relic glaciers will melt in the next few years. These summit glaciers were first surveyed before the First World War, and it has been estimated it has been estimated that more than 90% of the ice originally surveyed has disappeared since then. The expectation is that all glacial ice will have disappeared by 2030 as a consequence of both warming and atmospheric drying in this region. A clear example of climate change which threatens food security and household income for the population.

Many of those farmers known to SGG are also aware that:

- their lifestyle makes a relatively small contribution to the emission of greenhouse gases which have caused global warming and climate change. The main contributors to greenhouse gas emissions are the prosperous industrialised economies of Europe, North America and East Asia. Thus, on the basis of 'the polluter pays principle', it is reasonable to expect [or at least hope] that the more prosperous will be willing to donate some compensation to those suffering most from climate change;
- personal visits within their own East African communities quickly establish that places with good tree cover are more comfortable for living and more productive for farming than those places which are treeless. In addition there is also the widespread perception among those African farmers that 'trees can bring more rain';
- thus, there are many who are prepared to plant trees inside & outside their own farms, along river banks, on steep, rocky terrain unsuitable for agriculture or restore degraded forest areas in an effort to halt rapid climate change.

This project, therefore, also allows anybody who wishes to make a personal contribution to climate change mitigation to sponsor East African farmers who are able to plant trees on their behalf. The arrangements for this partnership will be made by Sustainable Global Gardens [UK charity reg. no. 1116243]. Any funder who wishes to have further information about Sustainable Global Gardens [SGG] is invited to browse the website www.sustainableglobalgardens.org.uk where there are instructions about how to donate.

This project concerns tropical tree-planting, but SGG is also aware that some donors may wish to reduce their carbon footprint by tree-planting in the UK. SGG does not want to deny such donors that option, so we would be pleased to fund an environmental partner who is implementing a scheme to plant 25,000 indigenous trees in the Yorkshire Dales. At present this particular scheme is 5,000 trees short of that planting target, which requires £12,500 of additional funding. Donors should indicate their preference for the Yorkshire Dales or elsewhere in the British Isles, if that is the case.

RELEVANT INFORMATION

The original plan was to launch this carbon capture project in late 2019. However, SGG and the whole of Europe have been severely disrupted by the coronavirus crisis in 2020. In mid-2021 it looks likely that the project will not get fully underway until much later this year when SGG hopes to undertake a field visit to East Africa, make new agreements and payments to African planters, and generally monitor progress. For the present SGG's main efforts will be focussed on raising awareness about tropical tree-planting for carbon capture & small-scale farm improvements, and securing sponsorship for this activity. However, we do not quite know what the future will bring!

As SGG is still fundraising and has delayed making precise arrangements with farmers we are still, in July 2021, in the preparation stage of this project with neither all the stakeholders nor the available budget yet known. Thus, the formal writing of all relevant project details has been delayed. However, the formal project report will include the following points, established after several years of successful tree-planting:

- a particular feature of this carbon capture project is that it will be implemented mostly on small-scale African farms. This is in accordance with the fundamental aims of SGG, which are poverty & hunger alleviation within locations where incomes are typically below $2/day. We strive to contribute to UN Sustainable Development Goals 1 [i.e. end poverty in all its forms everywhere] and 2 [i.e. end hunger, achieve food security, improve nutrition and promote sustainable agriculture]. We wish to engage hundreds of small-scale farmers in the task of climate change mitigation and provide them with a mechanism by which they can benefit from their carbon capture planting.

- SGG's general strategy is to partner with small-scale, semi-subsistence farmers and to promote various innovations which can increase farm productivity and household incomes. Such innovations have included microirrigation, improved composting, use of natural pesticides, permaculture methods, microfinance, and agroforestry. As agroforestry has been the most effective innovation for poverty eradication, we plan for the majority of carbon capture trees to be part of an agroforestry farm unit;
- SGG has several years' field experience of tree-planting in Kenya, Tanzania and Malawi. Under present circumstances we believe SGG has the capacity to arrange through our local African partners the planting of up to 100,000 trees with 20,000 trees for carbon capture, 10,000 fruits for improved nutrition, and 80,000 trees for multipurpose use. This estimate is based on the Rotary International initiative in 2017-8 when SGG registered 41,475 newly planted trees as part of the R.I President Ian Riseley tree challenge;

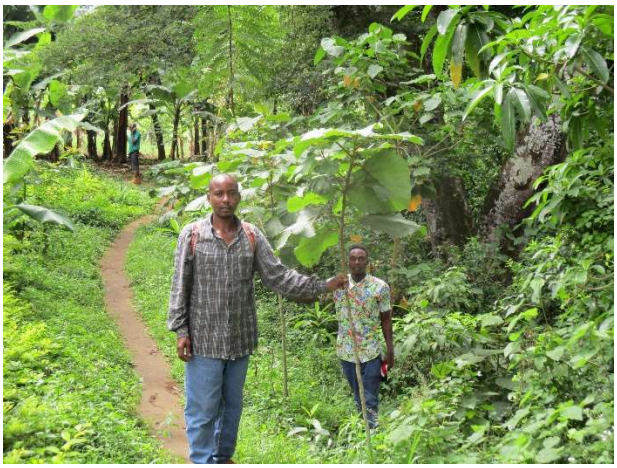
The location of carbon capture trees will be significantly different from SGG's previous planting locations. Until 2020 virtually all tree-planting was located on farms or on school grounds within those farming communities. These locations will continue to account for most SGG planting, but we are now looking also for planting sites where trees can continue to grow with limited interference from neighbouring villagers.

Good planting sites for carbon capture include:

- remnants of forest which can be restored or extended. Ngarasero forest *[see left]* near Usa River in Tanzania is a good illustration of this;
- riverine sites, especially where riparian land is steep & unsuitable for agriculture. Tanzanian farmers are not supposed to cultivate crops within 20m of streams in order to protect water supplies;
- summit & watershed sites where soil is stony after previous soil erosion;

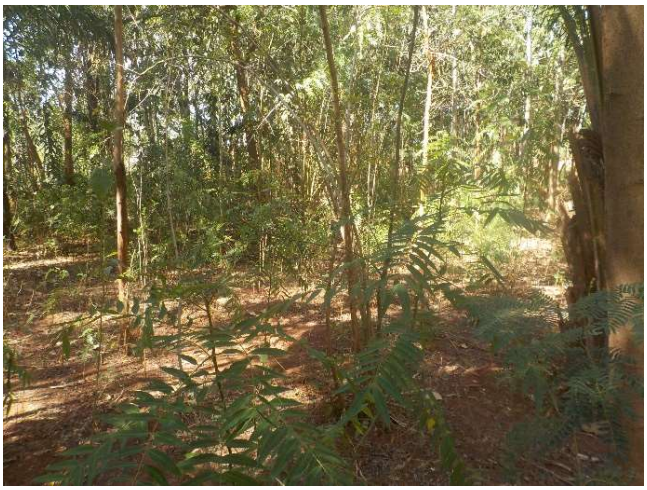
- preferred tree species will also be somewhat different from previous schemes. For carbon capture SGG favours the planting of large indigenous species [eg.Albizia schimperiana, Cordia Africana, Maesopsis eminii, Milicia excelsa, Trichilia emetica etc.], although onsite conditions will have a considerable influence on which particular species is planted. SGG will continue to promote several other tree species [e.g. pawpaw, moringa] but not for carbon capture: these species are suitable for farms but have soft wood and limited carbon capture potential;
- SGG has received many donations & small grants in support of tropical tree-planting. The justification for planting in East-Southern Africa is threefold : a] young seedlings are much cheaper to buy in African markets, so SGG advertises on the basis of "plant a tree for 20p" and a donor plants many more trees than could be planted in the UK where a young 'whip' with protective sleeve & stake typically costs about £2.50p; b] trees grow much faster in the humid tropics; c] tropical trees have all the environmental benefits of trees planted in the temperate world but also much greater 'humanitarian benefits' as they are often used as a 'reserve bank' to cover educational/medical/other occasional costs;

- although most trees planted within the full SGG-Rotary project will cost only 20p/seedling for multipurpose agroforestry species [e.g. Grevillea robusta, Markhamia lutea], seedlings planted specifically for carbon capture will cost £1. This is to provide compensation over an initial 5 year period for the farmer's loss of land & his/her care of the trees;



Close to Ngarasero forest there are various smaller patches of land where the forest could be extended, sometimes with the possibility of linking together two areas of forest. Such linkage can establish 'wildlife corridors' and help maintain the biodiversity of the forest. Here *[see above left]* is an example of Ngarasero forest extension with trees planted in the last 3 years. Different species are best planted according to different site conditions *[see above right]*. To the left of the path is level terrain and farmland where more than 100 Grevillea & Casuarina have been recently planted around a banana shamba. To the right of the path is very steep ground & a river. Here 'mikuyu'/fig species and 'loliondo'/Olea capensis have been planted.

Even in areas of high population density, it is possible to find small pockets of relic forest being conserved. Here is a plot of land near Matayos, Busia in West Kenya *[see below left]* with mature indigenous species. There are now many farmers who enjoy the pleasure of living among trees. Here is another patch of forest near Matayos *[see below right]*. Both of these situations, where the land owner has no desire to fell trees for economic gain, offer suitable sites for carbon capture and improved local biodiversity.



- this particular project has as a unifying theme 'Support for the Environment', but within that theme there are two aspects. One is to implement tree-planting in various African locations as a strategy for income-generation, on-farm environmental improvement combined with climate change mitigation for the benefit of all. The second aspect is to provide a tree-planting mechanism for those who wish to reduce their carbon footprint;

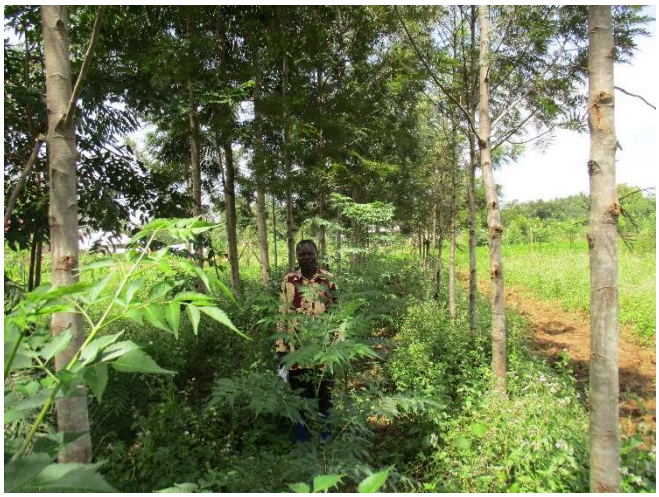
- this ‘carbon capture’ aspect is a pilot scheme, so the planting target is set at 20,000 for trees planted in tropical locations to enable African farmers to become accustomed to this type of enterprise. There is also an additional planting target of 5,000 for those who are prepared to pay a significantly higher premium to offset their carbon footprint with tree-planting in the British Isles;
- this carbon capture tree-planting requires approximately 200 African farmer participants [this will not be difficult as SGG has had contact with more than 250 farmers for more than 5 years in Busia County alone] who will have 50-200 trees each registered for carbon sequestration. Each farm will be georeferenced so that strict monitoring, transparency and accountability can be maintained;
- for carbon capture trees each participating farmer will agree to take care of the registered tree for a period of 5 years. To ensure that farmers comply with this, the tree nursery will be paid 15p, the farmer will be paid 10p when the tree is first monitored, and a further 75p is paid to the farmer five years after the initial tree registration;
- an alternative approach is to include well established trees which are 2 years old, have a height of at least 3 metres and a girth of at least 15 cms. SGG has detailed records concerning trees planted in previous projects, and these trees will be excluded. However, eligible trees will be registered, farmers paid an initial 25p, provided the farmers can ensure that those trees will be maintained for another 5 years when they will be paid the remaining 75p;
- SGG estimates that the likely number of direct beneficiaries for carbon capture trees will be 940 persons. These beneficiaries are members of a farming household where a small renumeration will be paid to recompense for loss of land & care of the carbon capture trees. The beneficiary figure is based on 4.5 being the average farmer household size in Busia, West Kenya where many of these trees will be registered. This project will also provide work for local tree nurseries, typically employing 2-3 persons so perhaps 30 persons in total. Most of the local fieldwork & monitoring will be undertaken by local coordinators, with whom SGG has worked for several years. SGG estimates that 10 coordinators will gain significant income from this occasional work;
- such payments & tree registration began in October 2019;
- after the initial registration most of the participating farmers will be monitored, so SGG can produce regular progress reports for significant donors. However, all carbon capture locations will be visited before the final payments are made after 5 years. At that time farmers will be offered further ‘carbon payments’ if they wish to maintain their 100 trees for another 5 years;

PROGRESS SO FAR

From 2018 onwards the Rotary Club of Newcastle-Gosforth raised funds to sponsor a tropical tree-planting project, similar to the SGG-Rotary Tropical Tree-Planting project of 2017-8. The Rotary club worked in partnership with SGG who were responsible for the project implementation at the first opportune moment. At the same time SGG undertook its own fundraising work with much of that funding raised either by giving talks about tree-planting to Rotary clubs or by making applications to funding trusts .

The actual implementation started in earnest from October to early December 2019 when SGG undertook a field monitoring visit to Kenya and Tanzania. By the end of 2019 SGG had recorded a total of 26,464 trees. The great majority of these trees followed the farmers’ preference for agroforestry planting, but perhaps 2-3,000 of these were planted for forest restoration & carbon capture purposes. SGG records showed that by this time there were 142 African planting partners, of which more than 120 were individual small-scale farmers. At this stage the majority of funding came from Newcastle-Gosforth Rotary who sponsored most of the 15,486 trees mentioned in a D1030 grant report. Thus, it was established that a single Rotary club could facilitate the planting of more than 10,000 trees in a single year.

What SGG wanted to encourage in 2020-1 was for individual Rotary districts to take on the "Ten Thousand Tree Challenge" of planting 10,000 trees in one year, either for carbon capture or agroforestry purposes. By May 2021 SGG knew of two Rotary clubs, Newcastle-Gosforth and Harrogate, who had already achieved this target. Congratulations to them both!



Here *[see above left]* is an example of agroforestry planting on a small-scale farm in Busia county, West Kenya. In this belt of trees there is a mixture of Grevillea robusta, Melia Azerdarach, & Markhamia lutea, but elsewhere on the farm there is a fruit orchard. As SGG and a group of Birunda Friends *[see above right]* walk along a farm path, we are counting recent tree-planting by the farmer. The trees here to the right of the path are Markhamia lutea, a favoured indigenous species often planted along field boundaries. Both of these planting partners started planting to develop an agroforestry farm unit, but they are both planning to plant trees primarily for carbon capture. They are looking for sponsors who will assist their efforts to combat climate change. SGG anticipates that by December 2021 there will be approximately 2200 trees specifically planted for carbon capture within the Birunda & Busia locations. We are currently looking for sponsors who wish to reduce their carbon footprint and contribute to climate change mitigation by supporting this African initiative.

The most significant change since December 2019 has been the inclusion of tree-planting for carbon capture within this SGG-Rotary project. Thus, the project is suitable not only for NGOs and Rotary clubs but also individuals – particularly those who wish to offset their carbon footprint. We are aware that there is increasing concern about global climatic change amongst the general public, but we are uncertain whether those concerned would be willing to donate precious funds to establish carbon sinks in Africa. Thus, our initial planting target for overseas carbon capture is set at 20,000 although SGG would be very pleased if carbon capture schemes accounted for a much higher proportion of the overall 100,000 tree target. Of course, it should be remembered that all the trees, including agroforestry species, will have some carbon capture impact.

Another change in 2020 from previous SGG-Rotary policy was to encourage similar tree-planting in areas outside SGG's customary locations, preferably in partnership with other NGOs & Rotary clubs. One example of this was the £200 grant given in January 2020 to the NGO 'UK to UK' for tree-planting in Ukerewe, Tanzania. Another example would be the 4,000 trees planted in Malawi by the W4Z charity. By May 2021 new tree projects were being established in Mubende Uganda and also on the Zomba plateau in Southern Malawi. We are now looking for Rotary club partners interested in carbon capture planting elsewhere. Negotiations are ongoing as financial support becomes available, but in June 2021 the likely locations for carbon capture tree planting include: 5,000 trees at Kipsaina, 2,000 trees at Kitale, 2,500 trees in Busia [all in Kenya], 1,000 trees at Usa River, 1,000 trees at Rombo, 2,000 trees around Mwika-Marangu area [all in Tanzania], as well as 2,000 trees on the Zomba Plateau in Malawi.

Unfortunately, the other major development of 2020 was the coronavirus pandemic, which has resulted in limited fundraising and a postponement of field monitoring work. This meant delays in all aspects of the project, but with more than 30,000 trees already recorded by mid-2020 we were in a good position to complete this project within 12 months after the end of coronavirus and associated travel restrictions. In June 2021 we have not quite reached that position yet.

PROSPECTS FOR 2021 AND ONWARDS

Although project progress has been limited since March 2020 when the UK went into national lockdown, it is not the case that nothing has happened. During 2021 SGG may not have been able to check progress during field visits to planting locations, but we have had success in gaining significant new support for this project. By May 2021 SGG had £14,035.41p funding specifically allocated to tree projects, and 30% of this [£4,678] is allocated for carbon capture planting. We need a further £15,322 to reach our planting target. So far such funding has come from 12 Rotary clubs, 3 commercial sponsorships, 2 UK funding trusts, and countless individuals. As these funds are largely paid after SGG has counted & monitored trees during fieldwork, a task which could not be done during 2020, SGG has most of these funds, which are still to be paid to African planters for the environmental services they have provided.

Some of the first spending for carbon capture went to this project near Kitale, West Kenya. This is the Kipsaina WASHplus project, which is being promoted by the Satellite E-club of Barnard Castle. This project is primarily concerned with biodiversity around a wetland & improved water supply, but SGG has contributed to this project by tree-planting in the transition zones between the wetland and surrounding farmland. SGG believes that adding a tree-planting component to any Rotary overseas project is an excellent way to get the local community involved and ensure the success of that project.

SGG's involvement here is to use this locality for planting specifically for the purpose of carbon capture. In July 2021, SGG requested the planting of 5,000 trees for this purpose. Each tree cost £1 so that payments to farmers can be made over a 5 year period in recompense for the loss of some of their land and for proper care of the trees. It can be considered as a payment for environmental services.

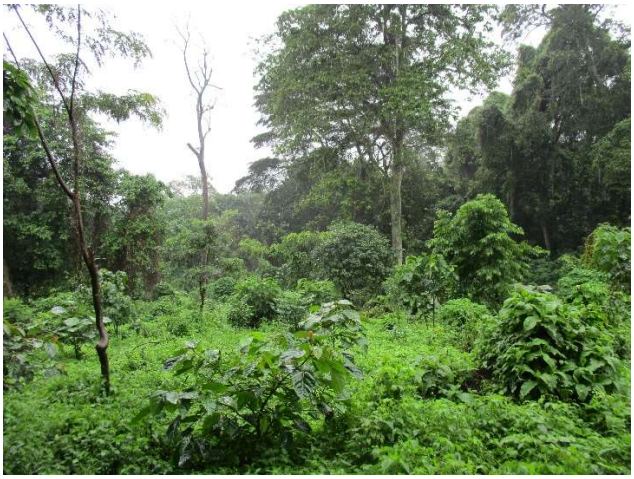
This nursery has more than 50,000 seedlings of indigenous species currently ready for sale, so here is an opportunity for any Rotary club or individual who wishes to offset their carbon footprint to contribute in a very practical way to climate change mitigation.

Coronavirus and lockdown has meant that many rotarians are kept back at the planning stages of their environmental projects, but life must continue on the East African small-scale farms which are implementing this SGG-Rotary project. Our farming partners continue to plant trees, even if they have to wait until the end of 2021 to receive their remuneration for environmental services. SGG anticipates that many, probably most, of those new trees planted in 2021 will conform to the following policy preferences for the project:

- support at least 10 community-based organisations [CBOs], schools or Rotary planting groups with a small grant which will allow the planting of at least 1,000 trees each. It is intended that at least 4 of these 10 small grants are invested with new partners in new locations so that more beneficiary farmers can be engaged;
- our priority will be to support planting on farms where the trees will belong to a farm household. We know that this improves the survival rate of young seedlings when they are vulnerable in the first year after transplanting. A major benefit of this strategy though is that, although our prime concern is climate change mitigation, we shall also be making a direct contribution to poverty and hunger reduction in rural Africa;
- it is expected that 200 farmers and their households will be direct beneficiaries of carbon capture planting. In addition many more will benefit indirectly from this climate mitigation work;
- Rotary clubs and planting partners work with SGG, who will take responsibility for monitoring the tree-planting and payment to farmers for the work they have done;
- SGG will also provide a progress report for all significant donors;
- SGG will look for funding support from both Rotary clubs and any others, either individuals or groups, wishing to contribute to carbon capture through the strategy of tropical tree-planting. The SGG network can readily find thousands of poor farmers wanting to plant trees, far more than a single Rotary club or Rotary District can support on their own. If your Rotary club or district wishes to get involved in this activity, SGG asks you to consider "The Ten Thousand Tree Challenge".

Here are a couple of examples of what can be done in North-East Tanzania. SGG is looking for degraded forests which can be restored by a combination of planting and rewilding. Below shows an area of degraded land on an old estate, which is now owned by a school. This school has sufficient land to plant more than 40,000 trees, and has been supported by both SGG and the neighbouring Mwika Rotary Club. There is plenty of room for carbon capture planting here.

Ngarasero Forest near Usa River, Tanzania – an example of how forest restoration, maintaining biodiversity and carbon capture planting can be combined



The photo above left was taken in April 2018. It shows an area of degraded forest on the edge of Ngarasero. Note the dead tree 100m away in the left background. In the foreground there are mainly bushes well below eye level, but there has been some spot planting. The photo above right was taken in November 2019 from exactly the same position. The dead tree is still visible, but the bush canopy is now well above head height. This simple example illustrates how rapid trees grow in the Tropics and how efficient they can be as a carbon sink.

SUMMARY

This document explains the carbon capture component of this SGG-Rotary tropical tree-planting and conservation project. It also describes progress made so far. At the time of writing SGG has a total of 80,035 trees either counted/confirmed by SGG, or recorded by SGG's local coordinators, or planned for planting before July 2022. Most of these trees have been planted for agroforestry purposes, but we anticipate that there will be at least 15,000 trees primarily for carbon capture. To date SGG holds sufficient funds to pay for 4,678 such trees. These seedlings may well be in the ground by the time of SGG's next monitoring & payment field visit, so SGG is now looking to secure further funding support of £15,322 so that we can achieve the 20,000 planting target within the next twelve months. Concerning the number of farmer participants, there are now 178 entries on SGG records, yet SGG estimates that we still have hundreds of farmers still to visit. Thus, although SGG currently holds significant funds, we have nowhere near sufficient to reward farmers for what they are doing to combat climate change. This document is, therefore, a call for more funding support from those who wish to improve the planet on which we live. If you intend to contribute to that improvement or would like to find out more details about this project, please contact the main project coodinator at sgginfo16@gmail.com through the Sustainable global Gardens website, www.sustainableglobalgardens.org.uk. I am looking forward to hearing from you.

Paul Keeley

Past President of Newcastle-Gosforth Rotary Club D1030

Director of Sustainable Global Gardens

1st July 2021