

CSC Evaluation and Monitoring Programme

Building a More Sustainable Future in Uganda: One Brick at a Time

Margret Mauricia Nambatya



With a rapidly expanding population of 42 million predicted by the World Bank (2021) to reach 100 million by 2050, Uganda is facing a number of significant resource challenges to improve livelihoods.

Many Ugandans do not have the means to build houses using quality materials, which has meant that they have become more reliant on cheaper, less sustainable methods of construction, which has led to increased pressure on natural resources and serious environmental degradation.

Meanwhile, more than 75% of Uganda's population are youths (below the age of 30), and at 13.3%, the country has one of the highest youth unemployment rates in Sub-Saharan Africa (World Bank, 2019). While innovative solutions are required to minimise damage to the environment, while addressing basic human needs and improving the quality of life for Ugandans, there is also an urgent need to provide skills training and employment opportunities for youths in Uganda.

Commonwealth Alumnus Margret Nambatya is offering solutions to these diverse challenges through the use of Interlocking Stabilised Soil Block (ISSB) technology- a novel approach to sustainable construction studied during her scholarship. ISSB has been proven effective in preventing deforestation and reducing carbon dioxide emissions, while providing sustainable school buildings and facilities to support education and creating employment opportunities for youths.

Sustainable construction in Uganda



Interlocking Stabilised Soil Block (ISSB)

Interlocking Stabilised Soil Blocks are manually pressed and then left to cure for 28 days. No firewood is needed in production. This environmentally friendly and cost-effective material has the potential to dramatically reduce the construction industry's carbon footprint.

8 DECENT WORK AND
ECONOMIC GROWTH



11 SUSTAINABLE CITIES
AND COMMUNITIES



13 CLIMATE
ACTION



Margret Mauricia Nambatya is a civil engineer currently working as the Country Manager for Haileybury Youth Trust (HYT), an NGO based in Uganda that promotes sustainable construction. She was awarded a Commonwealth Scholarship in 2014 to study for a Master's Degree in Engineering for Sustainable Development at the University of Cambridge. As a manager at HYT with nine staff members under her supervision, she is responsible for steering the strategic direction of the organisation and creating partnerships with other NGOs to construct using Interlocking Stabilised Soil Block (ISSB). In addition, she leads training of youths in Uganda in innovative and carbon-saving building technology, and construction skills, which has resulted in improved environmental education, employment opportunities and livelihoods. While contributing to preserving the landscape of Uganda, HYT has also transformed communities by building low-cost school buildings and installing rainwater storage tanks and sanitation facilities.

Building Blocks of Education

Prior to being awarded the Commonwealth Scholarship to study for a Master's Degree in Engineering for Sustainable Development, Margret had hopes and dreams about what she wanted to achieve following the award.

'When I return to Uganda, I hope to work as a change agent in the position of Project Manager encouraging the engineering organisations to have a mindset change from reductionist thinking to a complex system approach.'

After completing her studies as a Commonwealth Scholar at the University of Cambridge, Margret joined the Haileybury Youth Trust (HYT). As HYT's Country Manager she has successfully led and completed numerous sustainable construction projects in Uganda and is currently leading four major projects conducted in partnership with other local stakeholders, including Street Child Uganda, Catholic Relief Services, Children on the Edge, African Revival, and One Community at a Time. Most of these projects are located in three refugee settlements in Uganda, including Bidibidi which, with a population of over 250,000 refugees, is both the largest refugee settlement in Uganda, and the second largest in the world.

HYT contributes towards these projects through the construction of low-cost school buildings, childhood development centres, rainwater storage tanks, and sanitation facilities, all of which use Interlocking Stabilised Soil Block (ISSB) technology, a process which Margret studied at Cambridge University. This technology produces a building material that is a more sustainable alternative to the fired bricks which are traditionally used, and which contribute significantly to deforestation in Uganda due to the fuel needed for the firing process.

'A kiln stack of 10,000 [fired] bricks on average requires 14 tonnes of wood which translates to 3 mature trees of 1 and 1/2 ft basal diameter. ISSB saves all that since the blocks are cured not burned!'

Additionally, as the ISSB bricks require only small amounts of cement added to the excavated inorganic subsoil to gain their full strength, and the soil used to make the ISSB bricks is excavated from the building site, this approach minimises the resources required to make the bricks. This also removes the financial and environmental costs associated with transporting the bricks to the building site.

Wastage is avoided by producing a near exact number of blocks required for construction. Moreover, over 60% of the walls are left exposed, with no plaster, thereby further saving on resources while producing sustainable buildings.

Generating Community Support

While studying Engineering at Cambridge, Margret explored the effectiveness of using ISSB in tropical housing projects, using Uganda as a case study. Her investigation established that there were both technical and social barriers to the acceptance of ISSB in her community. Upon joining HYT Uganda, Margret was able to conduct further field work in her local community, which has allowed her to address some of these concerns and enabled a rise in the uptake of ISSB technology in construction.

'Studying Engineering for Sustainable Development helped me to recognise and put into consideration the economic, social, environmental, technological and cultural aspects surrounding an infrastructure project.'



RAVO Primary School, and rainwater tank, Mayuge.

She added that her decision-making skills had also greatly improved through her studies, and this was a result of learning to be a systems thinker. 'I used to have some sort of reductionist thinking where you look at an idea from one angle, particularly the technical side of the project. With the Master's, I found myself thinking in systems. So, when you look at a project that you're delivering it's not only about the technical aspect of the project but also other facets.' To apply this knowledge of 'systems thinking' in her current work, Margret actively seeks the involvement of various stakeholders in a project.

'The stakeholders have to be identified and included in all phases of the project. With the projects we deliver, we consider the pupils who are to use the classrooms and the trainees being empowered with construction skills. We also have the community involved in the project, the political leaders in the area and the professionals, from architects, engineers to physical planners.'

Consequently, one way that Margret has promoted the use of this technology is through the One Community at a Time project. Through this project, HYT trains youths who are above the age of 18 in the skills used in sustainable construction, and the use of compressed earth technology and ISSB. Upon completing the programme, some trainees continue to work with HYT on new projects, while others deliver projects for private clients or join the construction industry as skilled workers.

While many young people directly benefit from acquiring skills to improve their livelihoods and employment prospects, the programme reaches far beyond these individuals as it also leads to significant improvements to infrastructure in the education sector. Government schools with basic infrastructure needs are identified by HYT together with other project partners, and the schools' administrations and local leaders are asked to mobilise youths in their communities who are interested in learning about a new technology for sustainable construction.

The successful implementation of these sustainable construction projects has also largely depended on community support and motivation. This is essential not only because the community are asked to help support the projects in their local areas by providing food and accommodation for the youths in training, but they are also needed to help mobilise youths to enrol in the sustainable construction training programme. Margret and HYT encourage this collaborative relationship by highlighting the benefits the community will gain from the project.

'We paint a long-term picture of the project for them to see the need for their participation. Given the structures we build are permanent, even if their child is not going to this very school today, a great grandchild could attend school there because the structures are built with robust, proven and durable blocks.'

The experience of communities participating in the construction of ISSB buildings in their neighbourhoods has influenced an expansion in the uptake of this technology, and increased levels of environmental awareness. In addition, the life-time construction skills acquired by the youths have long-term benefits both for themselves, and their wider communities.

Buying In and Building Out

The work of HYT has drawn a lot of interest and investing partners who have bought into the ISSB walling technology. This has led to improved infrastructure development in Uganda, ensuring environmental sustainability, while boosting employment opportunities for the youth. An early partner of HYT was Children on the Edge, a charity focused on supporting marginalised children throughout the world.



First project with Children on the Edge at Loco PS, Jinja.

'Children on The Edge picked interest in the ISSB walling technology and our 'train as we build' approach and invited us to build an early childhood development centre, in Jinja. This was our first partner project and we've never looked back.'

Since then, Margret has been involved in environmental awareness campaigns which aim to convince NGOs to consider constructing buildings with ISSB technology that will minimise damage to the environment. The campaign is strengthened by the quality of buildings already constructed by HYT, which clearly demonstrate the effectiveness of using ISSB to build sustainable infrastructure. Appreciating the high standard of work, and understanding the need for environmental protection, several NGOs have partnered with Margret's organisation, primarily on projects focused on improving education through the construction of school buildings.

'Many [NGOs] were using contractors and building with fired bricks and have now come to appreciate building with ISSBs after visiting some of our completed school buildings.'

By teaming with partner organisations to build education infrastructure, as of 2020 HYT has trained **412** youths in sustainable construction, and provided infrastructure for **102** schools, including **158** buildings, **125** rainwater harvesting tanks, and **28** pit latrines.

‘As an organisation, we take delight in seeing the livelihoods of the youths improved, seeing them in further employment and seeing the structures they go on to build.’



Latrine Construction at Lake Site PS, Jinja.

The work of HYT has contributed to a transformation of the education sector in Uganda through the construction of sustainable school buildings and facilities across local communities, which has provided children with an opportunity to learn in a safe environment.

‘The children that were previously studying under a tree shade now have a safe and secure space where they can have their education.’

The schools have also benefitted from the construction of rainwater harvesting tanks, ensuring that children have adequate water supplies while at school, for preparing school meals and hand washing.



Latrine Construction at Lake Site PS, Jinja.

The tanks have also increased the available study time for school children, who had previously spent a significant amount of time travelling long distances to wells and springs to fetch water, a task which also exposed them to dangers, such as being kidnapped or sexually abused.

Room to Grow

In addition to leading various HYT projects, Margret is also involved in other aspects of the organisation's operations and future planning, an opportunity which she attributes to a management team that gives her the chance to apply other skills and knowledge gained through her scholarship.

‘The support I get from my employer comes more in the strategic direction. So, he's given me the space to actually do what needs to be done, to be able to innovate, to make things work. I am free to share an idea and if viable, we are able to implement.’

One responsibility Margret has been able to take on is representing her organisation at external events and conferences, promoting their work and putting into practice presentation skills that she developed while studying. The highlight for Margret of this aspect of her work was attending a conference in 2017 organised by Ashden, a UK-based charity organisation that promotes low-carbon innovations that help to address climate change in the UK and in developing countries.

At this conference, Haileybury Youth Trust received an Ashden Award for constructing sustainable buildings, and Margret gave a panel presentation on behalf of her organisation.

Making use of the negotiation techniques that she learned through her Master's degree at Cambridge, Margret has also assumed responsibility for the negotiation of terms with project partners and other stakeholders.

‘I successfully negotiated with the project manager of the ISU Compressed Earth boundary wall in Kamuli, Uganda for the extension of time and associated claim costs.’

Margret is also managing the funds and implementing the quality control procedure for her HYT projects. For this, she draws upon the Cambridge Management of Technology and Innovation course, which helped her to develop her management skills.

She added that she has improved her efficiency in delivering work tasks, which she attributed to being more organised with planning for events and activities in advance, a skill she sharpened during her studies in the UK.

Learning and Teaching

Given the platform to contribute to the strategic direction of the organisation, Margret has been able to introduce and implement various ways of delivering youth trainings and setting achievable targets for her work activities. As a part of these innovations, she has been able to teach colleagues things that she learned during her studies. Margret singled out ‘embracing change’ as one particular area where she has been able to transfer what she learned in her Change Management course to her work team, and field assignments are now being conducted more effectively as a result.

'I have also learned to embrace change and work in times of uncertainty by adopting new systems that improve efficiency.'

Margret has also contributed to training and development of the leadership skills of her work colleagues, and has encouraged a culture of knowledge sharing and ongoing learning across the team. This has been extended to other stakeholders through sharing of lessons learnt from projects and collective planning on how to incorporate them into future projects. It has resulted in improved communication between stakeholders and effective planning of projects, as well as providing Margret with an opportunity to put into practice teaching techniques that she experienced in the United Kingdom.

'The practical teaching methods [in the UK] were a great experience. I like to be practical with my team and to reason out any decisions with them.'

Having interacted with people from diverse backgrounds while studying in the UK and learning about different cultures has also had a great influence in her interactions while conducting her activities back home.

'I do things with others without imposing my way as the better way. And I think that is a very good skill that I acquired.'

Using her understanding of the local cultures and the context of work has helped her to effectively engage local communities to participate in suggesting possible and practical solutions to local challenges that come with implementing developmental projects.

Alongside her formal employment, Margret is an active member of the Uganda Commonwealth Scholars and Fellows Alumni Association (UCSFAA), which she describes as a great resource of networks for knowledge sharing and other opportunities. She works in collaboration with other Commonwealth Alumni to share the knowledge she acquired from her scholarship outside of her employment through the mentoring of others, including offering career guidance talks to secondary school students in her local community.

'The experience of participating in collaborated projects with other Commonwealth Alumni has opened my eyes.'

Margret is also involved in her community through the Girls4Girls mentorship programme. Following the completion of her scholarship, Margret undertook training with this programme, which provided her with an opportunity to build upon and pass along the skills that she had acquired, covering areas such as building trust, courageous leadership, networking, public service, running for office, and goal setting in times of uncertainty. This work is doubly rewarding for Margret, allowing her to have a positive impact and make connections with the girls she mentors, while simultaneously contributing to her own personal and professional development.

'I enjoy empowering young people, sharing my story and encouraging them to focus on their studies and also to look out for the scholarships when they get there.'

Future-proofing Sustainable Construction

Since completing her Commonwealth Scholarship, Margret has become an advocate of constructing buildings that transform communities, prevent deforestation, and reduce carbon dioxide emissions, while ensuring minimal damage to the surrounding landscapes. Margret cites her Master's studies in the UK as having equipped her with invaluable technical and soft skills that she now uses in her work to promote sustainable construction in Uganda. Reflecting on the ongoing influence of her studies, Margret highlights a change in perception as one of the most enduring legacies.

'I could say it is a mindset change. The way I viewed things before I got the scholarship to do my Masters is so much different from the way I see things now.'

In addition to joining with local and international project partners to use ISSB in construction projects, Margret also aims to convince partners to embrace the technology in their wider work. She hopes that by sharing their clients' positive experiences using ISSB, more NGOs will be persuaded of its effectiveness and begin including a clause on use of sustainable materials when drawing up tender documents for construction projects.

'It will be such a shame for us to deliver one project using ISSB for a client and on their next project elsewhere they continue to use fired bricks in walling.'

With more exposure to ISSB structures that have been constructed in various parts of Uganda, and the increased presence of HYT in refugee settlements, Margret believes that the key shelter players will be convinced to advocate for a national environmental policy that includes sustainable construction for all public structures, and a ban on use of fired bricks. She is currently working towards strategically positioning herself to contribute to advocating for this policy. To do so, she has joined two working groups, a shelter working group and a group focused on education in emergencies, through which she interacts with various influential stakeholders.

The successful implementation of an environmental policy to support sustainable construction would require all key stakeholders, such as funding organisations, lead organisations in settlements implementation projects, architects, and government, to work together. Margret highlighted the role of funders as being particularly important to this work.

‘Funders need to check for both how the funds are being used and the eventual effects of the methods of implementation. There’s always the thought that, yes, we are building schools for the children. Many ignore the adverse effects on the environment.’

In addition, Margret suggested that the enforcement should take place earlier in the process when bidders are applying for grants for construction projects, with funders being required to only approve grant applications if they have satisfied a sustainable construction clause.

‘This will certainly make the bidders re-think and consider sustainable construction methods,’ according to Margret.

In order to bolster the case for these changes, Margret monitors the environmental footprint of every project she is involved in.

‘I ensure energy savings resulting from the use of stabilised compressed earth blocks versus fired bricks are calculated for every project.’

Furthermore, Margret also links her work to the Sustainable Development Goals (SDGs). The projects that she works on at HYT cut across numerous SDGs, positively contributing to employment, education, infrastructure, and the environment.

‘The work of HYT Uganda advances many of the UN Sustainable Development Goals (SDGs) in particular SDG 8 (decent work and economic growth). It also impacts positively on SDG 1 (no poverty), SDG 4 (quality education), SDG 6 (clean water and sanitation), SDG 9 (industry, innovation & infrastructure), SDG 10 (reduced inequalities), SDG 11 (sustainable cities and communities) and SDG 13 (climate action).’

The environmental impact of HYT’s work is important to Margret, but she also works to promote environmentally friendly behaviour within her own workplace, where she supervises nine colleagues, who she encourages to monitor and reduce their use of electricity and paper.

The influence and flexibility she enjoys in her workplace has made her job more satisfying and fulfilling, and as such she has been with the same employer for five years following the scholarship. This has given her the opportunity to implement, monitor and evaluate various long-term projects that have brought about socio-economic development in her community.

Margret’s academic contacts [created through the scholarship] at University of Leeds in the UK are interested in developing technology in sustainable earth construction and are currently conducting research on replacing some of the cement in the ISSB with Rice Husk Ash. She is hoping that the success of this research will further enhance technology in sustainable construction and has the potential to reduce the cost of the ISSB technology that her organisation is currently using, further mitigating the environmental damage.

Apart from her employer, Margret added that she has met leaders in other organisations within her community who have encouraged her to follow her passion and career path. Having worked in the sustainable construction industry for over five years, Margret plans to register a private company which will focus on producing building blocks and construction for the private sector. Through this work Margret hopes to expand the use of ISSB technology in Uganda, and help to construct a more sustainable future, one brick at a time.

Developmental Outcomes and Impact

Drawing from the knowledge and skills gained during her Commonwealth Scholarship supportive management, work colleagues, and local and international stakeholders, Margret’s work in the construction industry has had positive outcomes and impact in her local and wider community.

As demonstrated throughout this report, by adopting a local approach to addressing climate change and achieving sustainable development whilst tackling challenges faced by local communities, she is actively contributing to both the socio-economic development of Uganda and to environmental sustainability. Her work has resulted in the improvement of infrastructure in schools and the local communities and the empowerment of the youth with life-time skills in sustainable construction that have increased their employment opportunities and improved their livelihoods. Meanwhile, her volunteering activities on supporting girls education through mentoring secondary school girls has empowered and positively changed the lives of these future agents of change for sustainable communities.

More about Margret’s work

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