PRACTIONER CASE (PEER-REVIEWED)

Educating for Change – Enabling Local Implementation of the United Nations' Sustainable Development Goals in Cameroon

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Abstract

The United Nations' Sustainable Development Goals (SDGs) framework was adopted by every member state of the United Nations in 2015, and, albeit not legally binding, it is arguably one of the most significant steps of humanity to address the identified problems of our time. It addresses a wide range of topics such as environmental protection, equal opportunities, education, eradication of diseases, famine, poverty, slavery and child labour. Both concerning its comprehensive scope and its worldwide support, this framework arguably represents one of the most significant international frameworks in human history.

Using education-related examples from a charity project related to a local health care system in the African rain forest in Cameroon, this paper illustrates how projects can and should implement critical aspects of the SDGs framework pre-emptively within their scope. This could be at the local level, before and in support of the full, legally binding implementation of the framework at the national level. This not only helps to make our world a better place but also very concretely to reduce project risks, create funding opportunities and make the project's deliverables more sustainable.

The 'Mahola Project' ('Mahola' means 'Aid' in the local Bassa language) was founded in 2013 – following an exploration trip to Cameroon in order to assess the real needs of the population in the deprived area around the village Siliyegue – as a response to meet these

needs. The main objective of the project is the development and deployment of a sustainable, integrated, local health care system that is fully aligned with the SDGs and brings about dramatic improvements for the quality of life of the people living there; far beyond 'just' providing health care and work opportunities. Education is at the core of the necessary efforts to successfully deliver this system, changing minds and hearts.

Introduction

In September 2015, the United Nations Sustainable Development Goals (SDGs) were adopted by 193 countries (1). They represent "a plan of action for people, planet, and prosperity" (1) from 2015 to 2030. The SDGs build on the success of the Millennium Development Goals (MDGs) which addressed the needs of Less Economically Developed Countries (2). The 8 MDGs set targets for key areas such as reducing extreme poverty & hunger and improving access to sanitation. The MDGs ran from 2000 to 2015 and have been described as "the most successful anti-poverty movement in history" (2).

Despite the significant improvement delivered towards the MDGs, we still live in a world where people experience hunger, suffer from air pollution and are disadvantaged by inequality. The SDGs go beyond the MDGs with a broader range of goals and apply to all countries, hence are often referred to as the 'Global Goals.' The SDGs consist of 17 high-level goals (shown in Figure 1) and 169 targets that provide more detail within each goal.

Figure 1   The United Nations Sustainable Development Goals (1) (Image used following the Global Goals Asset License at GlobalGoals.org)

Cameroon was one of the countries which made significant progress towards the 8 MDGs but still faces significant challenges in, for example, eradicating extreme poverty and reducing the burden of disease (3). The country restated its commitment to "Développement Durable" (Sustainable Development) and the adoption of the SDGs at the 70th session of the United Nations General Assembly (4).

This paper will look at an example international development project in Africa, the Mahola project (5), and how the project is implementing certain vital aspects of the UN SDG framework pre-emptively, i.e., before and in support of the anticipated full implementation of

the framework at the national level by Cameroon. The Mahola project is concerned with the development and delivery to the local population of a health care system in a deprived area in the African rainforest.

The Project Management, Awareness & Fundraising, and the Systems Engineering activities of the Mahola project can be considered parallel streams as shown in Figure 2. The Systems Engineering activities as applied for the Mahola project are displayed in phases that are roughly aligned, albeit simplified, with the INCOSE Systems Engineering Handbook (7) and the ISO 15288 (8): Concept phase; Design phase; Implementation & Integration phase; and Transition & Validation phase.
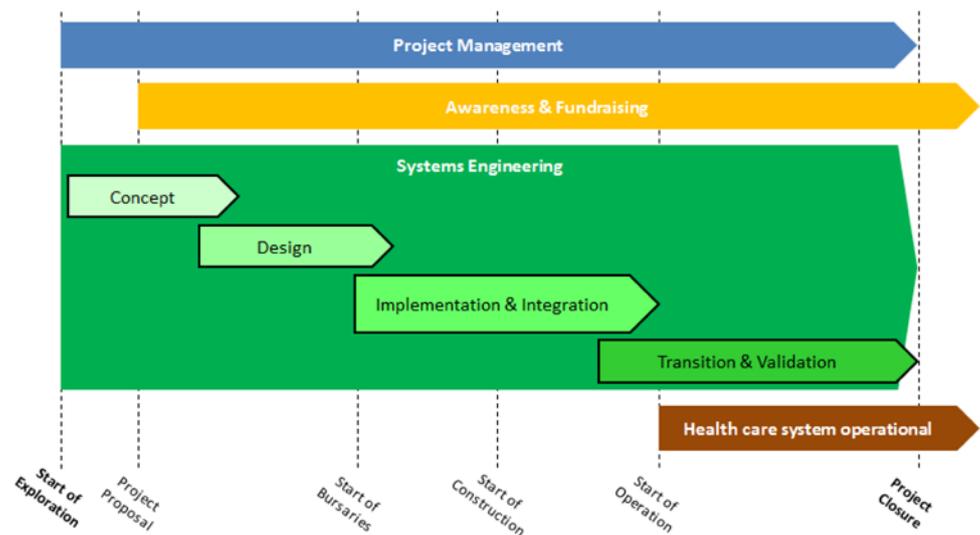

Figure 2   Project Management, Awareness & Fundraising and Systems Engineering
activities of the Mahola Project (5)

At the time of writing this paper, the Mahola project had completed the design phase, with three sub-projects still on-going that are concerned with the development of the solar energy sub-system, the ICT solution of the Mahola system and the development of a computer game for the recruitment and training of the staff members of the Mahola system, respectively.

However, the necessary funding for the implementation and integration phase of the project had not been fully secured. As such, the master schedule of this phase (Figures 3 and 4) is merely indicative of the activities, dependencies, and durations; but they do not represent the particular completion times of the related activities. Figure 3 provides the high-level master schedule of the implementation and integration phase of the Mahola project; whereas Figure 4 provides a more detailed view of the activities related to the implementation of the health centre as part of this phase.

In the following sections, the paper will look at the implementation of the SDGs by UN member states, and related difficulties for Multinational Companies (MNCs) and other multinational organizations, as well as projects that operate across national boundaries. Then we will present the pre-emptive, local implementation of related key SDGs by the Mahola project in general. Finally, the paper explores several more detailed, education-related examples of local implementations of the SDGs by the project.
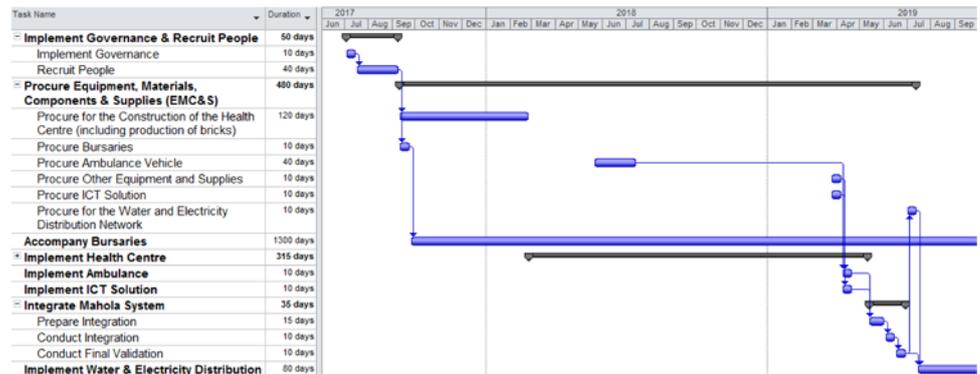
Figure 3   The Master Schedule of the Implementation & Integration phase (5)
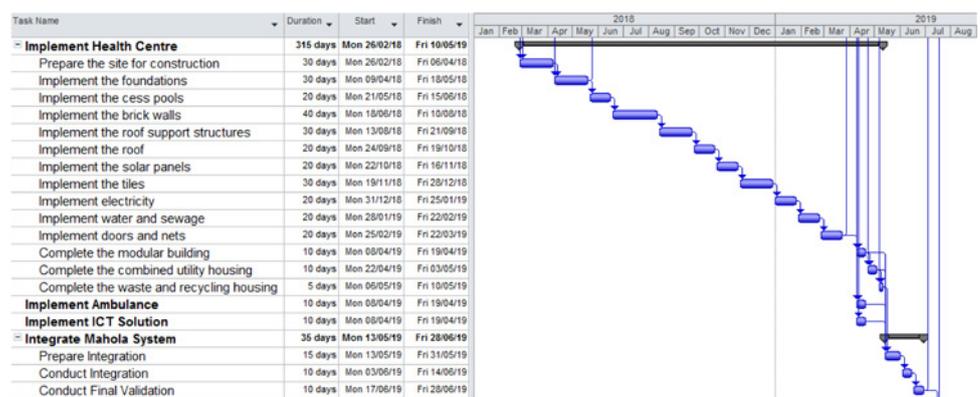
Figure 4   The detailed Master Schedule of the implementation of the Health Centre (5)

Implementation of the SDGs at the national level

The SDGs are an ambitious set of goals adopted by 193 nations, but they do not have the status of international law. There are a wide variety of implementation routes and stakeholders, though national governments are the "duty-bearers" in the end (9). Achievement of the SDGs is beyond the means or capacity of individual governments, and the SDG framework explicitly recognizes this in Goal 17 Partnerships for the Goals. Governments must work with other local and international stakeholders, including businesses and third sector organizations, for practical implementation. Some goals may be achieved through legislation or taxes, for example, Goal 13 Climate Action. Other goals will require the mobilization of business investment, e.g., Goal 7 Affordable and Clean Energy. As part of their support for the SDG partnership approach, the United Nations maintains a voluntary register of multi-stakeholder programs for delivery of the SDGs. At the time of writing, there were 14 partnership programs registered with impacts in Cameroon (10).

Implementation approaches will vary between nations based on their local circumstances and may take time to develop and deploy (9). Local government also has a big part to play and the Mayor of Bagangté, Cameroon was with other mayors in New York in September 2015 to express her commitment to the 'Urban Partnership for the Sustainable Development Goals' (11).

Many businesses are now starting to express the development benefits they provide, as well as the negative impacts they have, using the SDG framework. For example, Airbus has published its analysis of the 8 SDGs which are most relevant to its business (12). Some businesses are concerned that the 17 SDGs and 169 targets are too broad a scope for them to engage with meaningfully. A group of leading organizations in the fields of sustainable development and corporate social responsibility have published the "SDG Compass" as an approach for business leaders to "align their strategies as well as measure and manage their contribution to the realization of the SDGs." (13). The SDG Compass approach is shown in Figure 5.

Non-Governmental Organizations (NGOs) or 'Third Sector Organizations' usually have more experience in aligning their activities and reporting with national and international development priorities. This is often necessary for attracting donor support, and those, which have already been operating in the context of the MDGs will find it a natural transition to the SDGs. Faith-based organizations have played a significant role in the negotiation of the SDGs. Indeed, Pope Francis addressed the United Nations General Assembly which was gathered to adopt the SDGs. The SDGs are strongly consistent with the papal encyclical 'Laudato Si' (14).

As well as implementing partnerships to achieve the SDGs, there is a parallel requirement to report on progress towards the SDG targets. The data collection will be carried out by national governments and consolidated by the United Nations Statistics Division. They publish an annual report on progress to the SDGs (15).

This combination of evolving national and partnership initiatives alongside national reporting processes is essential in the context of the Mahola project. Since the specification of these areas is yet incomplete, we must use the SDGs framework as the outline requirements for the system and be prepared to report in a way consistent with the 17 SDGs and 169 targets.

The fact that the SDGs are implemented into national legislation by many countries in different ways makes future compliance with this updated legislation in each country a real challenge for MNCs, NGOs and international projects (both for-profit and not-for-profit) that operate across national boundaries. Next, we will look at how the Mahola project anticipates being compliant (pre-emptively) with the future implementation of the SDGs through national legislation.

The local implementation of key SDGs by the Mahola Project

Anticipating the full implementation of the SDGs at the national level by Cameroon, concerning legislation, regulation, programs, and reporting, the Mahola project took a prioritized approach to partial, pre-emptive implementation of the framework at the local level as shown in Figure 6. Key aspects of the framework were identified and explicitly fed into the project at the level of the User Needs, cascaded down via the System Requirements, and translated into corresponding Design solutions, and the Governance of the Mahola system, including the Governance organization, policies and training.

Figure 5　　SDG Compass Approach (13)

By explicitly addressing the SDGs as user needs for the project, and related, specific parts of these targets as project requirements and system requirements, the Mahola project can ensure that relevant aspects of the SDGs be implemented. These include how the project is run and the Mahola system as the project's core deliverable. For both the User Needs and the related System Requirements, acceptance criteria were defined that allow later verification of whether the Mahola system satisfies the system requirements (verification), and once put in operation (i.e., in the intended context), whether it satisfies the underlying User Needs (validation). Design solutions were developed to meet the applicable System Requirements that had been allocated to the sub-systems of the Mahola system. Some of these solutions to the requirements are the health centre, the ambulance, the Governance organization, policies and training of the local population.

The Governance Plan describes at a high-level all governance aspects of the Mahola health care system that need to be addressed to deploy, operate and at the end of its life cycle dispose of the system, including the business model both during the Mahola project and after the closure of the project, during the operational use of the system. It describes the local decision-making and the way the project, and later the system, will be governed and strategically directed through policies that are appendices to the Mahola Governance Plan. It also describes the oversight of the operations; the actual day-to-day running of the Mahola system regarding its processes and roles; and finally, it provides a nominal resource model that defines the number of employees and volunteers needed to operate the system as intended in accordance with the current system baseline.
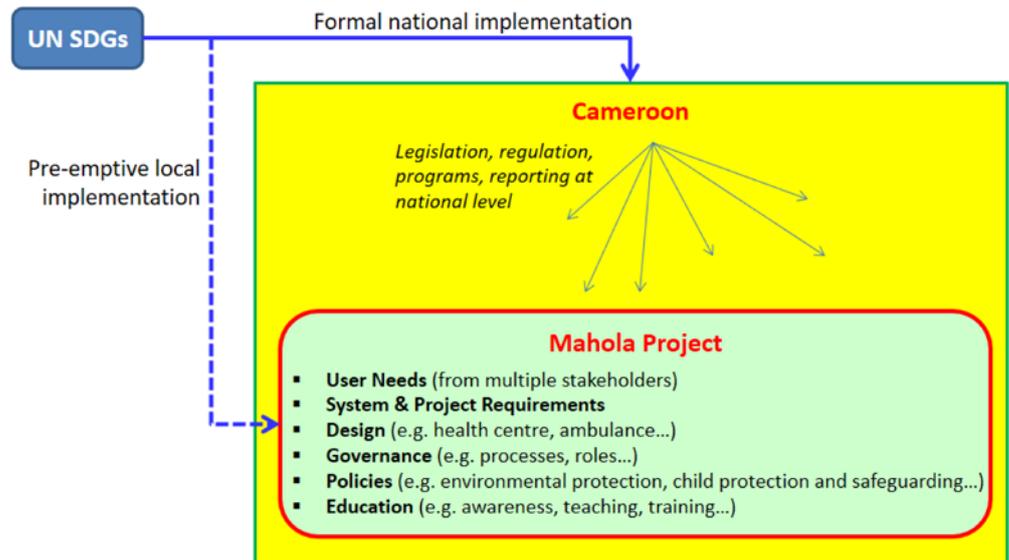
Figure 6   Pre-emptive local implementation of the SDGs by the Mahola Project (5)

Figure 7 depicts the Governance organization of the Mahola system, which has already been partly put in place during the Mahola project. The elected Steering Committee has already started overseeing the local activities related to the Mahola Project - supported from abroad by the project leader, the systems engineer and the local coordinator of the project - and will oversee the day-to-day operation of the Mahola System that, once deployed, will be managed on their behalf by the 'Administrator'.

The Steering Committee also nominates and supports five 'Officers' from among the local population for the five different topics of the Mahola Policies, i.e., Environmental Protection, Child Protection & Safeguarding, Health & Safety, Security and Ethics & Compliance. These officers will drive their respective topics and ensure that necessary steps be taken to continuously improve the Mahola system and generate awareness among the local population regarding their topic. They own the similar policies, which are one of the most important means by which the Steering Committee can govern and strategically direct the Mahola system; while they are also necessary to secure funding and other support from industrial, governmental and non-governmental organizations. Many of these potential partner organizations must, or will want to, make sure that adequate policies be in place and well implemented to qualify for their respective funding or other support schemes.

Furthermore, the policies under the ownership of these dedicated officers help to guide and make explicit reference to the SDGs strategically. For example, the Environmental Protection Policy states that 'the Mahola Project is committed to minimizing the negative environmental impact of its practices with the continual improvement in its environmental performance... The Mahola Project has many goals for those who live locally but are not directly involved in environmental matters. In particular, the Mahola project refers to (and strives to follow where applicable) the recommendations of the United Nations' Sustainable Development Goals (General Assembly, 2015)' (1).
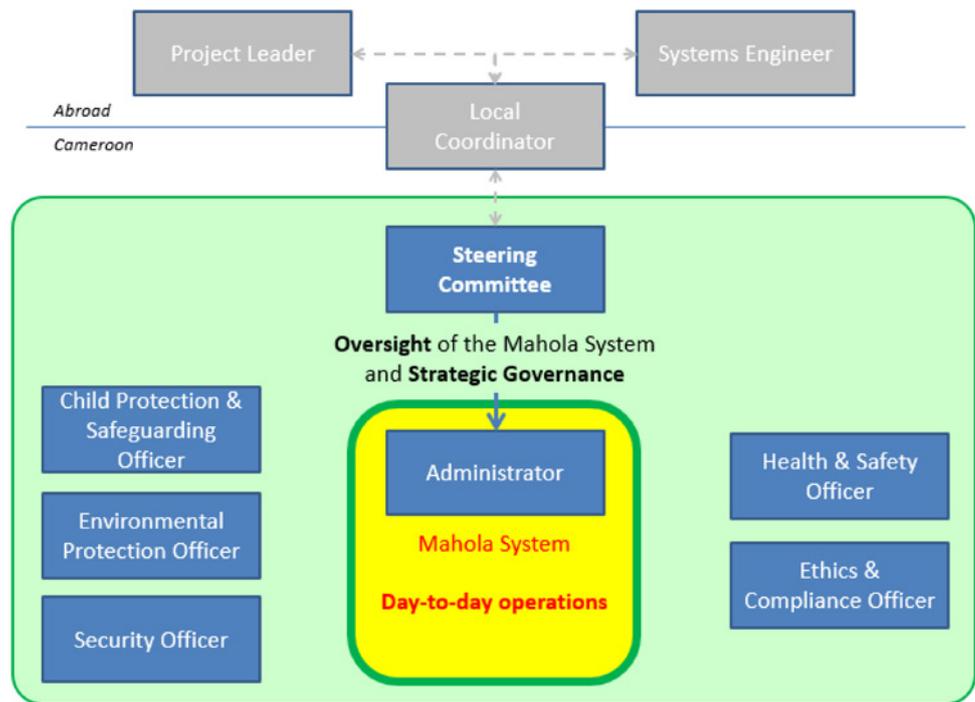
Figure 7   The Governance organization of the Mahola system (5)

To plan, conduct and assess the effectiveness of education-related activities to promote and implement the SDGs within the scope of the Mahola project – in close cooperation with these policy officers – one of the roles of the Mahola system is that of a 'Trainer.' This employee will drive all education-related matters, including the teaching of both pupils and staff members at surrounding schools, training of staff members and volunteers of the Mahola system, and raising awareness among the local population in the area.

Thus, it is anticipated that multiple objectives of the SDGs framework will already be sufficiently addressed, independently of the timescale of the national implementation of the full framework by Cameroon. However, this national implementation may contain detailed aspects that the project could not anticipate, e.g., reporting mechanisms and frequencies. The need for minor adjustments, therefore, should be expected. Still, most of the relevant, underlying topics are likely to have been addressed in a significant way already.

Education-related examples of the local implementation of key SDGs

Around the globe, education plays a crucial and undeniable part. It becomes even more powerful in deprived countries like Cameroon where access to schools and universities might not be a priority for families as they cannot perceive how it will help their children to become capable and respected members of the community they live in and how they will contribute to making the world a better place.

In the following part of this paper, we will develop how two concrete examples, based on the SDGs, could make a difference to the population in villages in the jungle of Cameroon. Our first topic consists of introducing, implementing and assessing the '3Rs – Reduce,

Reuse and Recycle' through a series of diverse and engaging lessons in the local primary schools of Mawel and Nguimakong, which are several kilometres away from Siliyegue. The selected aspects of the relevant targets under SDG 12 (1) are highlighted in green in Figure 8.

The second topic aims to achieve gender equality by emphasising and demonstrating to the members of the village of Siliyegue and other surrounding villages that both men and women can do tasks in and around the household. The selected aspects of the relevant targets under SDG 5 are highlighted in blue in Figure 8.

SDG   12   Ensure sustainable consumption and production patterns

12-5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.
12-8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.

SDG   5   Achieve gender equality and empower all women and girls

5-1 End all forms of discrimination against all women and girls everywhere.
5-4 Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate.

Figure 8   Selected example aspects of targets under SDGs 5 and 12

Figure 9 shows a typical curriculum map for the topic 'The 3Rs – Reduce, Reuse, Recycle', which represents a termly overview of teaching contents on the topic, and how these can be linked to different subjects that are taught in these schools. Linking the topic into several subjects brings the advantage of deepening the learning experience and making use of other knowledge and experience that pupils and staff members at these schools will gain. This also enhances the realization of how relevant this topic is, which could not be achieved if the topic was taught in isolation only.

Figure 10 displays a detailed teaching plan for a specific teaching unit on the selected topic. The benefit of such detailed teaching plans is that the teaching quality is likely to be higher and the knowledge created during the preparation, conduct and subsequent assessment of the respective teaching unit can be re-used and continuously updated and improved.

The teaching plan contains the learning objectives, criteria for the assessment of the teaching effectiveness (signs of success), inputs, group work and discussion elements, resources (17) and where they should be used, as well as short-term and longer-term assessment activities.
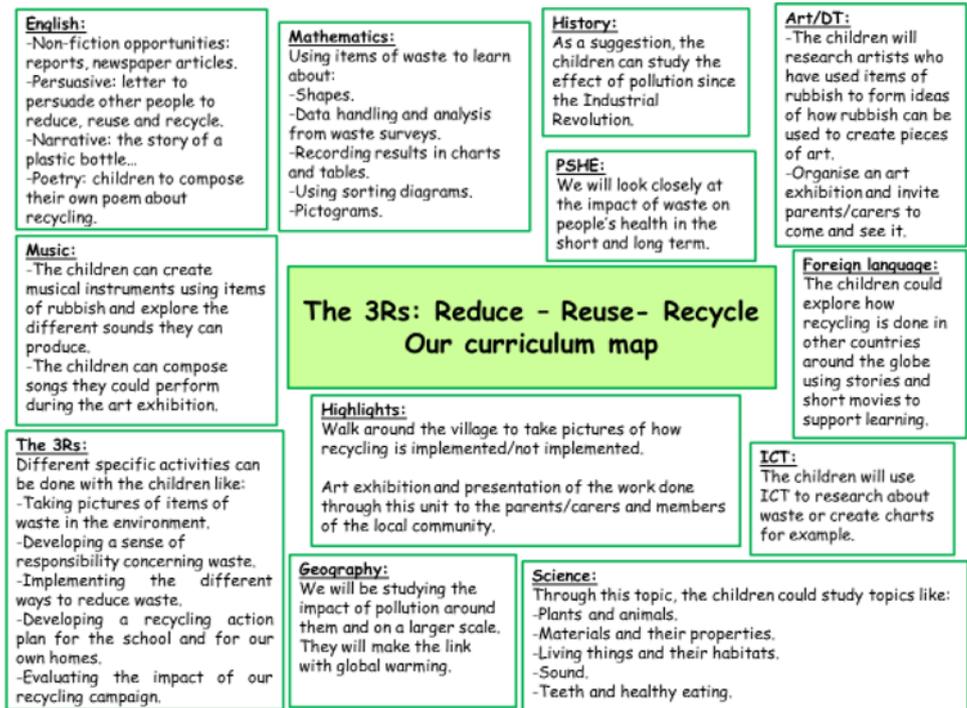
Figure 9   Example curriculum map – a termly overview of teaching contents and how these can be linked to different subjects

Figure 10   An example teaching plan for a classroom teaching unit

Figure 11 provides an example teaching plan for a series of five awareness sessions on the topic of 'Gender Equality' that can be delivered to multiple villages, one at the time. The intended public includes everyone in each village of the area, from children to grandparents, women, and men, boys and girls. The target of these awareness sessions is to help bring about

a deeper understanding of 'gender equality' in general, and especially the empowerment of all women and girls, and what this means to local people in their daily lives. While it is true that both men and women are discriminated against in certain ways of life or professional areas, it is arguably more difficult for women to overcome such difficulties, hence the particular focus on the empowerment of women and girls.

The first session aims to raise awareness among the inhabitants of the village and the surroundings concerning gender equality and empowering all women and girls, starting with the sharing of thoughts and opinions about these ideas and how they are perceived within a family or the community. It is essential to record what is shared so that it could be used as a reference to track changes and progress towards our goal. The basic thoughts about the topic will be repeated briefly at the beginning and end of each subsequent session to enforce the main messages.

The following sessions will look in turn at activities that are typically reserved for men and other activities reserved for women respectively. Practical activities could be climbing up palm trees to harvest seeds needed to make oil (subject to volunteers of course) and then pressing the seeds to produce oil, which are activities traditionally carried out only by men. Activities could follow that are typically carried out by women only, such as cooking and washing up. These activities and a meal following the sessions are further opportunities to bring everyone together and discuss and strengthen the bonds among the local population.

Figure 11   An example teaching plan for village awareness events

Multiple role plays with volunteers from the people present would also be useful to highlight certain points and provide an enjoyable time for everyone. For example, a role play with a girl playing a bus driver and discussing with a male midwife their working day would not only help to raise awareness and critically think about the current situation, but it would also be perceived as funny, enjoyable entertainment with all the people from the community

together, a real social event. Based on the above, next steps can be agreed and followed up to improve the current situation locally in a concrete way.

Conclusion

The paper first looked at the United Nations' SDGs framework, which was argued to be one of the most significant international frameworks in human history, both concerning its scope and its worldwide support. Then we briefly addressed the implementation of the SDGs by nations, as well as MNCs, NGOs, and projects that operate across different countries; and we looked in more detail at the pre-emptive, local implementation of critical aspects of the framework using an example of an international charity project.

This pre-emptive and partial implementation at the local level, before and in support of the anticipated implementation of the SDGs by Cameroon through national legislation, was pursued for multiple reasons. They include: including the wish of the project team and stakeholders to bring about significant improvements along some of the axes suggested by the SDGs, and also, the necessity to secure funding and other support from various organizations that increasingly expect at least partial project alignment with crucial elements of the SDGs to qualify for their support. In addition to that, not anticipating pending changes in the local legislation that are based on Cameroon's commitments concerning the national implementation of the framework would have represented a significant risk both for the project itself and the sustainability of its deliverables, most notably the Mahola system as the core deliverable.

The paper looked especially into some education-related aspects and presented two concrete examples of driving education to make progress towards achieving relevant SDGs (via certain aspects of their associated targets). The first concerns the topic of the '3Rs – Reduce, Reuse and Recycle' through a series of diverse and engaging lessons in the local primary schools of Mawel and Nguimakong, which are several kilometres away from Siliyegue. The other concerns 'gender equality and the empowerment of all women and girls' through a series of awareness sessions for village communities in the area that focus on specific tasks in and around the household that could be carried out by both men and women.

The above, of course, does not only apply to the Mahola project, which was used here as an example. Instead, from a project management perspective in the international context, relevant aspects of the SDGs and their associated targets must be considered to make any such project more successful, reduce project risks, and make the world a better place. Education is key to achieving this. Thus, planning, conducting and assessing (and reporting on) SDGs related training, teaching and awareness activities should be pro-actively integrated into similar projects' master schedules – even if there may not be a legal requirement to do so yet.

Therefore, we strongly encourage everyone who is leading or otherwise involved in supporting an international development project to make sure that the relevant aspects of the SDGs be considered and implemented as appropriate in the given context. The project's long-term success depends on a clear focus on education to enable the necessary changes in the minds and hearts of the various project stakeholders and beneficiaries.

About the Authors

Ian Brooks is a Senior Lecturer in Sustainable IT at the University of the West of England (UWE) and a Senior Teaching Fellow at the University of Bristol. The large part of his career has been in management consultancy and Green IT with PricewaterhouseCoopers and IBM. His last role with IBM was as their Sustainability leader on the IBM outsourcing contract with Defra (the UK Department for Environment, Food and Rural Affairs). He has an MSc in Environmental Consultancy from UWE and has embarked on Ph.D. research on the use of the UN Sustainable Development Goals as Requirements in Software Engineering, also at UWE.

Dr. Mario Kossmann (ESEP) is an experienced Systems Engineer and Capability Integrator for Airbus, having previously worked for Blohm & Voss as Program Manager, Systems Engineer, Technical Manager and Consultant in Services Marketing. He has served as a naval officer with the German and French navies, and was awarded an MEng in Aerospace Technology from the University of the Federal Armed Forces in Munich (Germany), an MBA from the University of Warwick (UK) and a Ph.D. in Systems & Software Engineering from the University of the West of England. He is the author of the books 'Delivering Excellent Service Quality in Aviation' (Ashgate 2006) and 'Requirements Management – How to ensure that you achieve what you need from your projects' (Gower 2013), as well as numerous research publications in the fields of Systems Engineering, Software Engineering and Project Management. Mario is also a certified Project Manager and 'Expert Systems Engineering Professional' (INCOSE). Mario has been involved in the 'Mahola' project (www.maholaproject.org) as both Project Leader and Systems Engineer from the start of the project in December 2012.

Virginie Kossmann is an experienced primary school teacher in the UK (all age groups and subjects), having previously worked as a head teacher of a primary school, and teacher in various primary schools in France. She was awarded a BSc in Sciences (Physics and Chemistry) from the University Paul Sabatier in Toulouse, France, and has 'Qualified Teacher Status' in both the UK and France. Virginie has been involved in the 'Mahola' project (www. maholaproject.org) and guided the project in matters related to education including bursaries, teaching, and training, from the start of the project in December 2012.

References

1. United Nations General Assembly. Transforming our world: the 2030 Agenda for Sustainable Development [Internet]. A/RES/70/1 2015 p. 1–35. Available from: http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E

2. United Nations. The Millennium Development Goals Report 2015 [Internet]. New York; 2015. Available from: http://www.un.org/millenniumgoals/2015_MDG_Report/pdf/MDG 2015 rev (July 1).pdf

3. United Nations Statistics Division. MDG Country Progress Snapshot : Cameroon [Internet]. New York; 2015. Available from: https://mdgs.un.org/unsd/mdg/Resources/Static/Products/Progress2015/Snapshots/CMR.pdf

4. Biya P. Declaration by The Cameroon at UN General Assembly 70th session [Internet]. New York: Permanent Mission of Cameroon to the United Nations; 2015. p. 6. Available from: https://sustainabledevelopment.un.org/content/documents/20628cameroon.pdf

5. Mahola Project. Mahola Project [Internet]. 2017 [cited 2017 Mar 9]. Available from: http://maholaproject.org/

6. Kossmann M. Developing the system requirements for a local health care system in Cameroon. Proj Manag World J [Internet]. 2014; III(IV):1–11. Available from: http://pmworldjournal.net/wp-content/uploads/2014/04/pmwj21-apr2014-Kossman-requirements-health-care-system-cameroon-AdvancesSeriesArticle.pdf

7. INCOSE. Systems engineering handbook: a guide for system life cycle processes and activities. Walden D, Roedler G, Forsberg K, Hamelin R, Shortell T, editors. Vol. Fourth. Hoboken, New Jersey: Wiley; 2015. 510 p. https://doi.org/10.1002/j.2334-5837.2015.00089.x

8. International Organization for Standardization. ISO/IEC/IEEE 15288:2015 - Systems and software engineering -- System life cycle processes [Internet]. 2015 [cited 2017 Nov 8]. Available from: https://www.iso.org/standard/63711.html

9. Sustainable Development Solutions Network. Getting Started with the Sustainable Development Goals [Internet]. Paris; 2015. Available from: https://sdg.guide/

10. United Nations. Partnerships for SDGs platform [Internet]. 2017 [cited 2017 Mar 10]. Available from: https://sustainabledevelopment.un.org/partnership/search/?str=

11. Sustainable Development Solutions Network. Global Mayors, Governors Commit to Urban Sustainable Development Agenda and Aggressive Emissions Reductions [Internet]. 2015 [cited 2017 Mar 10]. p. 1. Available from: http://unsdsn.org/news/2015/09/23/global-mayors-governors-commit-to-urban-sustainable-development-agenda-and-aggressive-emissions-reductions/

12. Airbus. Airbus Group - Responsible business [Internet]. 2016 [cited 2016 May 18]. Available from: http://www.airbusgroup.com/int/en/corporate-social-responsibility/Responsible-Business.html#

13. Global Reporting Initiative, UN Global Compact, World Business Council for Sustainable Development. SDG Compass – A Guide for Business Action to Advance the Sustainable Development Goals [Internet]. 2015 [cited 2016 Feb 15]. Available from: http://sdgcompass.org/

14. Francis. Laudato Si' [Internet]. Vatican: Vatican Press; 2015. 184 p. Available from: http://w2.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html

15. United Nations. The Sustainable Development Goals Report 2016 [Internet]. New York; 2016. Available from: https://unstats.un.org/sdgs/report/2016/

16. Global Goals Educator Task Force. TEACH SDGs [Internet]. TEACH SDGs. 2017 [cited 2017 Nov 27]. Available from: http://www.teachsdgs.org/

17. ECO-Schools Northern Ireland. Eco-Schools Resources [Internet]. ECO-Schools Northern Ireland. 2017 [cited 2017 Nov 27]. Available from: http://eco-schoolsni.org/cgi-bin/portal?section=publications1