

INTERNATIONAL COOPERATION AS A DRIVER FOR STUDENT DEVELOPMENT – A CASE STUDY BASED IN GEOSPATIAL INFORMATION TECHNOLOGY APPLICATION

F. Sanchez Iglesias¹, M.A. Grande Ortiz¹, A. Serrano Iglesias², M.J. Garcia Garcia¹, C. Echavarria Caballero¹

¹Technical University of Madrid (SPAIN)

²Zerca y Lejos ONGD (SPAIN)

Abstract

Acknowledging the historical context of international engagement in Africa, this paper pivots its focus towards contemporary initiatives, specifically delving into the topic of service-learning oriented student projects on the continent. In recent years, there has been a growing trend of collaborative efforts between students from various international institutions and local communities in Africa that may evolve into dynamic avenues for cross-cultural exchange, community engagement, knowledge transfer, and sustainable development.

The significance and impact of such student-led projects are examined with a case study performed in collaboration with the NGO Zerca y Lejos, using Geospatial Information for decision-making with the Baka population from South Cameroon.

The paper also addresses the unique situations that may be presented to a student when facing challenges such as resource constraints and regional disparities, proposing tailored approaches to ensure the sustainability and scalability of internationalization efforts. It underscores the importance of incorporating indigenous knowledge systems into the globalized curriculum, fostering a balanced and culturally sensitive educational environment.

In conclusion, we present a compelling argument for the strategic integration of international collaboration into the fabric of the current university student curriculum. Outlining a vision for mutually beneficial collaboration that respects the autonomy and cultural richness of African nations and highlights the importance of fostering partnerships built on trust, equality, and shared goals, transcending traditional donor-recipient dynamics.

Keywords: Service-learning, International cooperation, Sustainable development

1 INTRODUCTION

An ultimate objective of education, in any of its stages, is the integral development of a person for the improvement of the world. Education is the most powerful weapon to change the world in both an integral and global sense and this can only be achieved via knowledge, investigation and skills for life and co-living.

Higher studies allow for a privileged space to accomplish this task. Not only is a shared space for teachers, investigators, and students, but also, the university is recognized as the quintessential place to prepare a student for a future profession, by the teaching of content, practice, skills and competencies needed for professional performance and also for the personal development in a team or a society spanning far more than just the individual.

Service-learning is a methodology that relates two fundamental streams. On one side there must be a learning experience and on the other there must exist a service, giving an answer to a real need. Learning must come from an analysis and investigation implied in the application and acquisition of knowledge, skill development and a coordinated and collaborative work. Everything is founded in a practical reflection that allows for the improvement of the project ([1]).

There is a clear difference between service-learning as a whole and volunteering and learning separately. Service-learning is the combination of both, and they complement one in the other. Individual talents must be cultivated by fomenting social compromise ([2]) and service-learning is key for this purpose as the learning is performed while offering a service to the community.

Social compromise both by students and teachers is key for a successful development of any service-learning project. True compromise implies dedication and passion for the task and to put out the work needed to bring a change to our reality ([3]).

As this paper puts its focus on the African continent, the main drawback that any service-learning strategy must overcome is the lack of basic infrastructure, which in some areas can greatly hinder the development and reach of any kind of research project. Existing collaborative structures that could be provided by an NGO, are crucial to be utilized by the students for the learning purposes and to enrich their experience. Given the short time frame of a student-led project (typically not longer than one year), a partnership with a well-established organization is essential to guarantee the accomplishment of the project objectives.

Therefore, a service-learning strategy was started by a group of professors from the Universidad Politécnica de Madrid (UPM) in collaboration with the NGO Zerca y Lejos (ZyL), that has been working in the South region of Cameroon for more than twenty years. The collaboration interests are focused on achieving the following objectives:

- Implementation of service-learning methodologies in engineering students.
- Promotion of international cooperation and volunteering aligned with the objectives of the NGO.
- Development of a collaboration strategy between the university and NGOs, to be maintained and continued in time by both parties.

2 CONTEXTUALIZATION

The United Nations agreed on 17 Sustainable Development Goals on September 25th, 2015, in order to work on the elimination of poverty, protect the planet and ensure prosperity for everyone, as part of a sustainable development agenda ([4]).

The 17 SDG, shown in Figure 1, are broken down into 169 objectives and they are also referred to as Agenda 2030, as it is the target year to achieve the objectives.



Figure 1. Sustainable development goals ([4])

The SDG have become a source of inspiration and should influence both teachers and students that wish to make significant contributions to both the environment and the society. The University must be implicated with the fulfillment of these objectives both at an institutional and curricular level, and Service-Learning is a fundamental tool to foment the social and environmental involvement of the students ([5]).

Getting involved in any ongoing project related to the SDG via international cooperation must be possible for any student and must be available on their educational curriculum, however in the case of engineering students, their options could be more limited than other specialties such as medicine or

education. Particularly in the case of medicine, it is common for medical students to complement their studies with some kind of international volunteering experience, and there are many NGOs that offer regular programs to accommodate these students; however this is typically not the case for engineering or science students and therefore a special effort must be made to offer projects that could accommodate these students and also, at the same time, to take advantage of the skills and knowledge these students can bring to the international cooperation organizations.

For this reason, a collaboration strategy was started by a group of professors from the UPM with the NGO ZyL. ZyL is a Spanish NGO founded in 2001 with the objective to “*guarantee the recognition of the dignity of all human beings and to improve their quality of life by providing the necessary tools, knowledge, infrastructures and support*” ([6]). The NGO, since its foundation, has been working hand by hand with indigenous populations in Cameroon and Peru to seek the recognition of their Human Rights, as well as access to health care, safe drinking water and quality education.

In South Cameroon, ZyL has been closely working with the baka people, who are an ethnic group distributed mainly in the tropical forests from regions South and East of Cameroon, and other neighboring countries such as Republic of the Congo, Central African Republic, and Gabon. They are known by their short stature, of 1.52 m on average for adults, and they have traditionally followed a semi-nomadic lifestyle. These factors have made them suffer systematic discrimination by other ethnic groups of the region ([7]).

Baka people have historically kept a hunter-gatherer lifestyle inside the jungle; they traditionally lived in semi-permanent spherically shaped one-family houses called *móngulus* ([8]), shown in Figure 2.



Figure 2. Traditional Baka leaf hut. Bemba II, South Cameroon.

However, their means of life had been gradually changing in the recent years, and they have been forced to adopt a more sedentary lifestyle, placing their houses near the main roads, and using more permanent building materials, as their bantu neighbors, in part due to deforestation and also due to pressure from the Cameroonian government ([9, 10]). Currently many baka villages depend mainly on agriculture and one-family farms (Figure 3).



Figure 3. Baka woman working in her fields while carrying her child. Assok, South Cameroon.

Their main language is Baka, an Ubangian language they share with some similar ethnic groups in the region. Many baka are bilingual or multilingual, being able to speak other bantu languages such as Fang, Bulu or Ewondo, in addition to French. Language plays a very significant role in the cultural and social identity of the baka, and its linguistic complexity has been the subject of several academic studies ([7]).

In South Cameroon ZyL has been working with the baka people surrounding the Dja faunal reserve, in the Djoum-Mintom area (Figure 4) and the Bengbis area.

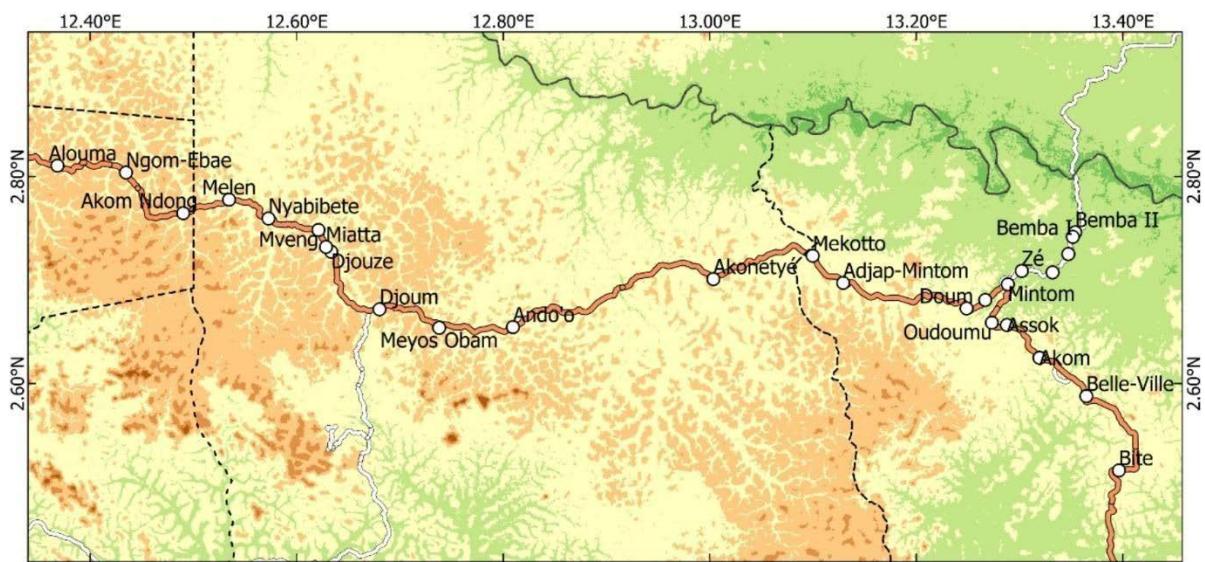


Figure 4. Baka dwellings in the Djoum-Mintom axis.

3 CASE OF STUDY AND RESULTS

ZYL expressed their need to have an updated cartography of the Djoum-Mintom and Bengbis areas, comprising the health centers, schools, and water access points. The information could be used to improve the effectiveness of the NGO action in the area being able to know with precision the distance the baka people from each village must travel to access these basic needs.

The work was launched in collaboration with the department of “Ingeniería y Gestión Ambiental” from the UPM and was designed as a master thesis, in which a general study of the baka agricultural fields was also performed in addition to this cartographic mapping.

The study included a detailed bibliographic review to have the most complete cartographic information and set-up a GIS environment, and a 3-week research stay in the area to take the GPS coordinates of the points of interest, perform surveys to the local population, and study the agricultural fields (Figure 5).



Figure 5. Dialogue with a baka worker in their yuca plantation. Ndjibot, South Cameroon.

The survey with the baka population was performed in the villages shown in Figure 6; 3 villages in the Bengbis area: Ndjibot, Bifolon and Mimbi, and five in the Mintom area:

- Congo Axis (East): Odoumu, Assok, Akom
- Djoum axis (West): Doum-Zoulabot
- Dja axis (North): Bemba II

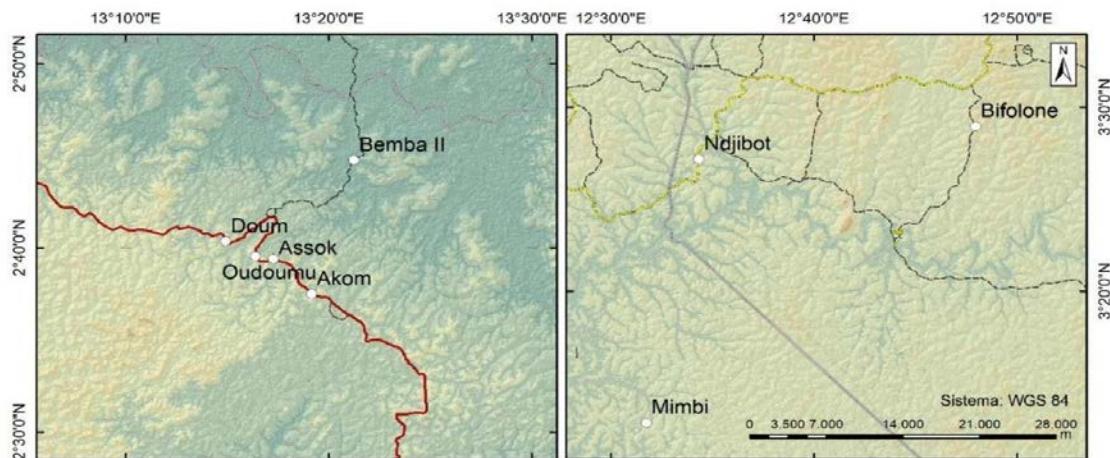


Figure 6. Surveyed baka dwellings in the Djoum-Mintom area (left) and Bengbis area (right) ([11]).

Additionally, water access points were also verified in the following locations: Nkoulaze, Belle Ville, Nkolembula, Meyos, Akonetche, Ando-o, Mekoto, Meyos Obam and Ajap-Mintom. The location, distance to town and state of the water pump (or lack thereof) was documented.

A cartographic visor was developed in order to provide easy access to the data collected for people not trained in the use of GIS tools, that would be of use to the NGO volunteers for future projects.

4 CONCLUSIONS

The work and research performed in the case study clearly have provided an extensive learning experience for the student, both in a personal and academic manner; accomplishing the educational objectives of the service-learning project and providing an enriching experience for the student, Mario García Peces, who offered us the following testimony:

"In the framework of my master thesis, I had the honor to collaborate in a great project of international cooperation focused on guaranteeing the autonomy and human rights of the baka in Cameroon. This experience, which would have been impossible without the collaboration with ZyL, has allowed me to delve into the realities and needs of these local communities and learn about the importance of equity and access to essential resources."

Service-learning initiatives in Africa offer a symbiotic relationship, and the case study discussed demonstrates this. African communities benefit by the resources and knowledge brought in by international partners while the students gain a valuable experiential learning and a deeper understanding of African cultures and challenges. The collaborative nature of these projects fosters an impact that is sustainable and enriching for all parties involved. By working closely with established NGOs and local communities these initiatives are more likely to address long-term needs and ensure continuity even after the project concludes.

Even beyond the primary objectives of the project, these initiatives facilitate rich cultural exchanges. Participants on both sides gain insights, dispel stereotypes, and foster global understanding; but it is also crucial to recognize potential challenges such as power dynamics or cultural sensitivities and they must be addressed ensuring equitable participation.

There is a pressing need for increasing collaboration and research in Africa to achieve the SDGs by 2030. NGOs, educational institutions, and other stakeholders such as governments or even private enterprises should prioritize in SDG related initiatives and maximize their potential impact fostering genuine global solidarity.

ACKNOWLEDGEMENTS

The authors would like to express their gratitude for the funding and support provided by the UPM via the international cooperation aid program for students, which was essential for the execution of this project. We would also like to express our gratitude for the hospitality provided by the Cameroon people and specifically to the baka community who participated in the study.

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