

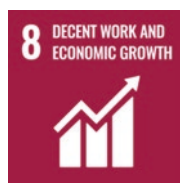
Stories from Students Building Sustainability Through Transfer of Leadership

13

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Abstract

Dedicated to designing and organizing student-centered work, we highlight the Geomatics Engineering Students' Association of Nepal (GESAN)'s collaborative effort to create training, internship, and job opportunities for the student members and alumni and with local institutions. Through putting into play a cycle of leadership, chapter activities find a sustainable way to continue to support SDG 8 Decent Work and Economic Growth and SDG 9 Industry, Innovation, and Infrastructure by preparing students to navigate newer applications of geospatial technology and tools. This work extends beyond campus and into the local community where we have trained secondary school students in map literacy – planting seeds of future leadership.



Keywords

Economic development · Youth leadership ·
Local collaboration · Nepal · Industry

1 Where the Cycle Began

Even though we were a small group of students in Nepal and engaging a subject that we didn't know the full scope of, in reality, our affiliation to YouthMappers gave us a valuable connection that we never thought we would ever have. We found ourselves together with the students of the world who were thinking just as us and were like-minded in terms of the importance, use, and value of open geospatial information. The different challenges and activities organized by YouthMappers encouraged us to organize mapathons, conduct map literacy programs and educate female students of our locality about geographic data and led us to design and conduct geocaching on our campus and many more activities.

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2 YouthMappers in Nepal

The Geomatics Engineering Students' Association of Nepal (GESAN 2017) is a student association that was founded in November 2014, and I was appointed as the president of the 2nd executive committee on August 16, 2015. Our student-led leadership committee organized a grand program on March 5, 2016, to celebrate Open Data Day (Kathmandu Living Labs). This event started my journey, as well as our chapter's journey, of being affiliated with YouthMappers. Through this program, we were introduced to YouthMappers by Dr. Nama Raj Budhathoki of Kathmandu Living Labs. Our journey of learning and collaborating with the YouthMappers international university consortium was just getting started. It was a moment of jubilant joy when we officially affiliated GESAN with YouthMappers and we were listed as a chapter that year, which was the first of its kind on our campus – and among the very first in the region as a whole, too.

Before, I joined GESAN as a volunteer, I didn't know what geomatics really was, I even didn't know the real meaning and applications of the field. I used to take it only as a part of surveying. As I started involving in the activities of GESAN as a volunteer, I came to know it as one of the multidisciplinary subjects with a wide range of scopes. As GESAN used to organize different programs, webinars, workshops, I got many platforms and opportunities to play, enjoy and learn many things about this field. During this, I became able to judge and define geomatics as not only surveying (Napi) but also the sector of mapping, remote sensing, Geographic Information System (GIS), GNSS and many more. During this volunteering experience I can never forget about the love, teamwork and helpful environment that I got from the GESAN family (Sangeeta BC, volunteer of 6th executive committee).

2.1 Designing Student-Centered Activities

Through our years of actively participating with YouthMappers, regular mapathons are the place for everyone to connect and get to know each other better in person. The environment for teaching and learning mapping skills among the members is mutual and feels like everyone is on the same page with an intention to contribute to the world and help people in need by providing missing data to the map. Our collaborations with humanitarian mapping agencies that provide critical support through mapping campaigns to capture vulnerable, and often missing, parts of the earth are something we strongly advocate for (O'Hara 2018).

During the execution of our mapping activities, there have been times when we were met with challenges. For instance, while we were in search of potential sponsors for the publication of our annual magazine, we experienced many setbacks, receiving some very direct “No's” to “We'll inform you later.” Our hopes to launch a magazine in a predetermined time had us feeling crestfallen until our situation changed. With every positive response, we were inspired much more than before. The positive rays helped us keep our hopes held high, and after finding sponsorship, we were able to successfully launch the magazine right on time along with a grand geospatial meet-up. The setbacks were something we struggled with when we encountered them. But in the end, they made us stronger and better prepared for future problems. The challenges our team has overcome have certainly helped in developing our communication skills, multitasking abilities, and time management.

Working as a committee member in GESAN, helped me a lot in my career. It is a great platform to learn different aspects of Geomatics. As Geomatics was a new faculty at that time, GESAN let me know the scope of our field, what we can learn and how we can serve our society. I got a

chance to meet respected personnel while conducting and attending programs of GESAN, which is providing additional support in my career. During one of the trainings, I came to know about Kathmandu Living Labs (KLL), a non-profit organization and later this organization became my working place for about one year and I learnt so many things. I don't think this would be possible without GESAN. Now I have been working as Survey Officer for the last 3 years and the management capacity, public dealing capacity, teamwork, I learnt from GESAN is helping me a lot (Nisha Adhikari, executive member of 1st executive committee).

One of our most successful chapter activities resulted in more than 40 members from GESAN mapping for more than 40 days to digitize an area covering two districts with more than 50,000 buildings and 1,500 km of road networks on OpenStreetMap (OSM; GESAN). Our members were highly involved in trial and community infrastructure mapping of Bajhang and Bajura District. Top mappers were awarded with gift hampers and were provided an opportunity to get involved in field data collection in Bajhang District.

2.2 Adaptability During the COVID-19 Global Pandemic

The year 2020 began with the COVID-19 global pandemic, and we all were locked inside the house due to lockdown. In this pandemic too, the concept of online programs, especially webinars and online training, helped students gain some extra knowledge and spent their free time learning something new and useful. Our first attempts to conduct OSM training and a mapathon to map Pyuthan District of Nepal were successful with 20 participants mapping for a week. To bring different tasks to our members, we conducted a vari-

ety of programs that involved webinars on light detection and ranging (LiDAR), which is a new topic in Nepal. Similarly, we conducted trainings on web mapping with Leaflet and GeoDjango and processing drone data. We continued the publication of our annual magazine *Geo World*, which was inaugurated online and then distributed in a digital format so that it could reach a larger audience throughout the whole world.

I never thought working virtual from everything physical would be that easy and simple, though I had never heard or used online platforms like Zoom/Teams/ Google meet. Going up virtual had its own privilege. We could take training from seniors and teachers all over the world. We could conduct programs like OSM mapping, GIS training, web-mapping virtually with participants from college as well as from outside college. I think online platforms gave us the chance to broaden our horizons (Kiran Bhusal, treasurer of 6th executive committee).

This challenging year provided us all the opportunity to learn. It definitely enriched us with new paths to explore. Every member of the organization worked as a group to learn new things, implement them, and, more importantly, pass it on to the new generation of students who were joining the chapter.

My experience with GESAN has helped me in many ways. Before working for the committee, I had very little experience on leadership strategies, time management and decision making. I remember when I got a chance to organize a training program under my coordination, I was made more aware of the need for these important skills. Simply from writing a mail to writing the agendas of the meeting, the opportunity

definitely helped me flourish my critical skills. My engagement with GESAN made me more prepared for my professional career and, I can surely say, it has had a significant impact on the execution of the works after I landed my first job as a research associate at Asian Institute of Technology, Thailand (Tek Bahadur Kshetri, executive member of 3rd executive committee).

2.3 Valuable Collaborations Happen Locally

Even during the difficult times of COVID, we adapted with the new normal and partnered with other institutions for different mapathons and trainings. Collaboration is something we strongly advocate for and have designed successful collaborations with different national and international organizations like NAXA, the World Food Program (WFP) Nepal, and the Youth Innovation Lab that have delivered fruitful results. Locally many student members of GESAN have participated in activities, trainings, and projects organized by Kathmandu Living Labs (Khanal et al. 2019). Most of our current members and alumni are still active contributors to OSM and are active members of the OSM community in Nepal.

All year, GESAN organizes different events that foster personal and professional growth opportunities in the students. These events include introductory OSM workshops, the map literacy program, mapathons, talk sessions, and trainings focused on using the different tools that integrate with OSM, to name a few. The activities mainly focus on student empowerment, female participation, and creating dialogue and partnership with different organizations. We are continuously working to fill the geospatial data gaps in Nepal and other countries. Involvement in all these activities either through organizing them or participating in them has developed leadership, communication, and other different soft skills in us. It is to be noted that all the efforts done by the

members are voluntary rather than paid works. So far, as a YouthMappers chapter, GESAN has been able to set an example to the other chapters, and we still have a long way to go (Fig. 13.1).

The collaborative effort of GESAN with other institutions has resulted in several internships and job opportunities for the members and alumni. This is one strong indication of our contribution to SDG 8, decent work and economic growth through youth employment. According to SDG 8.6, the goal is to reduce the proportion of youth not in employment, education, or training. In a similar line, we have trained secondary school students with map literacy. Likewise, we have encouraged female students to take part in our training with a motive to instill in them the idea of geography-related subjects and reduce the gender bias in the geospatial industry.

Working as GESAN's treasurer was a fantastic experience that boosted my confidence and helped me develop my networking skills. GESAN served as a platform for us to gain geoinformation and build our networks. It gave me the opportunity to participate in a number of conferences and seminars, which introduced me to the world's developing geoinformation community. Being a part of this community influenced my decision to begin my career as a research associate at the Asian Institute of Technology. During my time at AIT, the leadership I gained at GESAN aided me in completing my task and delivering it well to the end-user. This GESAN-developed quality in me has also been extremely beneficial in obtaining a highly regarded Erasmus scholarship. Currently, I am an Erasmus student pursuing a master's degree in Copernicus Digital Earth, and I believe that GESAN has been a good influence throughout my academic career (Pratichhya Sharma, treasurer of 2nd executive committee).



Fig. 13.1 The GESAN Chapter of YouthMappers pivots to a robust virtual program of activity in the wake of the COVID-19 pandemic shutdown of in-person meetings

3 Prioritizing Chapter Sustainability

We have prioritized setting a proper tone in the chapter. We, as a chapter, have always focused on maintaining a culture of well-being within the members of the chapter, fostering education and training, promoting inclusivity, and building a resilient, student-led team. *Map Literacy* is an annual program organized and led by our female members that target high school girls and teach them the basics of maps, while encouraging and inspiring female leadership. These activities have helped our own GESAN members in multiple ways, and through continued practice of transferring skills and leadership to a new generation of students, we are preparing and inviting future students to join us.

As confirmation of our priorities, every year GESAN has been awarded for the contributions our members have been continuously making to fill the data gap through mapping. In 2021 our

effort to bring about change has been recognized with the *YouthMappers Top Editors Award* and *Chapter Inspiration Award*. One of our members and alumna received the *2021 Best YouthMappers Blog Award* and the *2021 Best Alumni Blog Award*, respectively. By cultivating this tradition of supporting and mentoring chapter members, GESAN has been represented in multiple YouthMappers fellowship cohorts and has presented at international conferences organized by the OSM community. All these awards have encouraged us to continue putting effort in the sector. All these warm and beautiful experiences shared by each member gives a kind of happiness of what you have done so far for GESAN and its members. It also gives confidence that the upcoming generation holding the backbone of GESAN will lead to the greatest height. As time passes, the opportunity for the upcoming members will increase along with more and more challenges to overcome.

The work that we did as a committee, that I am very proud of, is advancing GESAN from a campus-based club to TU chapter of YouthMappers. That decision has helped us and future generations to develop skills and learn more about open data. Being a member of GESAN helped me throughout my career, I could embrace the new opportunities and the new world of scientific and academic works. In my career, while working with the Asian Institute of Technology and also during my MSc at ITC, I could use many things that I learned at GESAN such as holding meetings, preparing minutes, and listening to ideas from others. I had also built my network bigger through the conferences that I attended when I was a member of GESAN. I have always had a deep interest and am eager to learn more about geomatics and using geospatial data to solve real-world problems. My current Ph.D. research is on geospatial modeling and monitoring of earthquake-induced landslide hazards which is mostly related to the use of geospatial data and modeling using the geospatial data (Ashok Dahal, secretary of 2nd executive committee).

the fact that there is always room for improvement, we have been trying to reduce the gender disparity in executive and general members of the committee. One of the reasons hindering this effort is the unequal ratio of male and female students in the engineering colleges of Nepal. Inclusion of women mappers in various mapathons, map literacy programs, and other activities can boost their confidence, and promoting their work is a good start.

Recalling the journey from being a fledgling university chapter to having matured into a globally recognized chapter, each and every step on the way has been a learning experience for everyone engaged. The problems we faced and the success we achieved are lessons we can treasure for life. Ending on a positive note, we see this sustainable leadership of GESAN in the future as well, with a greater focus on collective leadership rather than individual. And all the while, all of this adds up to our own incremental contributions to advancing SDGs, especially when it comes to SDG 8 Decent Work and Economic Growth, for our careers, and SDG 9 Industry, Innovation, and Infrastructure, for our institutions that we transfer forward.

4 Future Outlook for Us and for the SDGs

GESAN will focus on collaboration with more diverse organizations, because even though we have been able to engage with many local actors, we have not been able to work with the national mapping agency and other government bodies. A partnership with a government institution would expand OSM to a wider audience and create more opportunities for youth in the field. Contemplating

As a student who was just going into the sophomore year at university, I didn't know how to make a CV, as well as to write answers which were 800 words long. Being one of the 20 participants selected for the YouthMappers Leadership Fellowship from chapters around the world was obviously a dream come true. Meeting many people for the first time from different countries gave me international experience. The leadership workshop taught me key skill sets in an easy and interesting way which has been an asset to me till date and served my chapter as well (Saurav Gautam, YouthMappers Regional Ambassador and former Leadership Fellow, President of 2nd executive committee).

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