Understanding YouthMappers' Contributions to Building Resilient Communities in Asia

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Abstract

This chapter considers the contributions of YouthMappers chapters in Asia. In addition to a regional overview, we highlight actions of students in Bangladesh and the Philippines to fill critical data gaps that support community access to information during emergencies, natural disasters, and pandemics. Lack of data leads to poor decision-making at any time, but in the context of shocks and hazards, it can have an especially profound impact on local communities. By creating open geospatial data and by advancing the geospatial capacity of university students and local community members, local governing bodies will be able to plan for the well-being of their constituents and community members will have access to the information necessary to keep their families safe. This contributes to better health and well-being (SDG 3) and a more resilient society in the face of impacts of climate change (SDG 13).

Keywords

YouthMappers in Asia · Mapping contributions · Climate change · Pandemic · Health

1 Footprints of Youth and Open Data in Asia

Let us listen to what is happening in Asia where youth are making themselves heard through the map.

The voices coming from this region of the world are uniting under the banner of YouthMappers, creating data to begin to address all our development objectives, following the United Nations Sustainable Development Goals. In particular, the youth in this region are motivated to contribute toward SDG 3 (Good Health and Well-Being) and SDG 13 (Climate Action) through data collection activities and campaigns to accurately provide open and accessible information on health sites and other assets ahead of natural disasters. Bottom line is that all of the

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SDGs, when focused on reduced inequalities, are able to improve our well-being as a youth population and a region as a whole.

2 Generation of Open Spatial Data in Asia

Asia is the region of the world with the highest numbers of people on earth, and it is also among the regions with a great potential to engage very large numbers of YouthMappers in terms of chapters, students, and edits. Asia is one of the continents to receive considerable mapping attention from OpenStreetMap (OSM) edits where the total edits by YouthMappers in any world region hit the highest, with 7.2 million, for more than 6 million distinct visible map features (latest edited by YouthMappers). Edits to building objects are also the highest for any region among YouthMappers, topping 6.5 million edits on about 5.7 million buildings.

These numbers are impressive considering that Asia is not the region with the largest number of university chapters (Africa has the most). But our students are very productive and engaged, and there have been early and frequent mapping campaigns that have added significantly to the map. Chapters are present in Bangladesh, Bhutan, India, Iraq, Indonesia, Japan, Nepal, the Philippines, Singapore, and Sri Lanka, while mapping is happening throughout the entire region by students here and elsewhere in the global network. Figure 7.1 presents the total edits in the Asian region since the beginning of YouthMappers.

Looking at the cumulative count of features edited by YouthMappers in Asia, the edits in Bangladesh make up approximately half of the contributions to OSM. This is followed by Nepal and the Philippines seeing the next most editing (by feature count) among all YouthMappers. In addition, YouthMappers have created tagging for 13,507 distinct amenities, such as schools, businesses, or points of interest. As of the start of 2022, 97,287 km of roads and paths across the continent were last edited by YouthMappers. The campaigns to create this data have often directly led to the well-being of the population in our region, frequently in response to disasters and hazards like flooding, hurricanes, and earthquakes. Having this data created by and for our region to help those most in need, making this data more open and visible, certainly contributes to regional equity and the health of our residents, including ourselves.

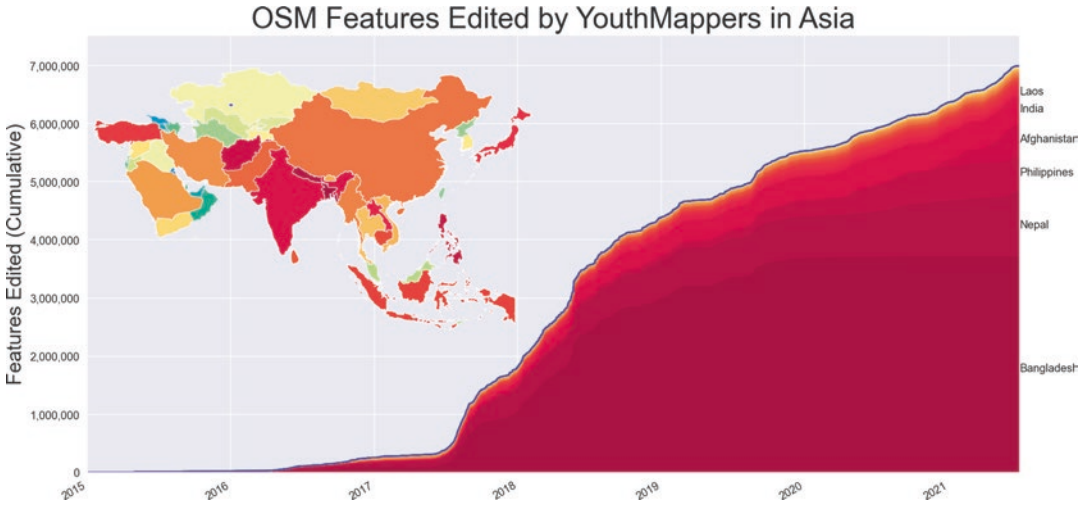

Fig. 7.1 Accumulated changesets in Asia over time show growth since the beginning of YouthMappers in OpenStreetMap. (Credit: J. Anderson 2022)

3 Resilience and the Sustainable Development Goals

Our contributions have significantly increased the amount of open geospatial data accessible by all for several purposes geared toward the attainment of SDG 3 Good Health and Well-being and SDG 13 Climate Action. Not all geospatial data are readily available and accessible to the general public, making it difficult to provide an analysis on the socio-cultural issues that we are continuously facing. Data on critical facilities such as health facilities, essential services, and residential building footprints are needed when responding to natural disasters or a global pandemic. Investing in activities and campaigns that generate data and fill in gaps also supports community-level decision-making as they navigate uncertainty by making critical information available to them. This awareness of both vulnerabilities and assets is a foundation for building resilience (Rodin 2014).

4 Chapter Contributions in Response to COVID-19

The COVID-19 global pandemic is reshaping how geospatial communities respond to the socio-cultural problems in society. The pandemic demonstrated the need for collaborative geospatial data to help local communities better understand the crisis we are facing collectively. Since the onset of the pandemic, there is an increasing demand for real-time maps, and readily available crowdsourced information plays a critical role in keeping the general public informed and prepared.

Bangladesh and the Philippines were both affected by the pandemic. In the Philippines, crowdsourced mapping accelerated to provide the general public with information relevant to the pandemic since communities in the Philippines were under a strict lockdown. Crowdsourced geospatial data with national coverage has the advantage that anyone can use the data. It makes the relevant information accessible to anyone, which can also support decision- and policy-makers in responding to the pandemic.

4.1 Mapping Health Facilities

The first mapathon, organized by the local OSM-Philippines community, was "mapagaling," which means *mapa* (map) and *galing* (to cure). This mapathon gathered volunteers in the Philippines to map health facilities and services in the country using OSM. The mapathon consisted of a short introduction about using OSM and MapContrib to train users with little to no experience of using a map to contribute missing data such as location and contact details. Once uploaded to OSM, this information became available to the general public.

The student members of University of the Philippines Resilience Institute (UPRI) YouthMappers, the YouthMappers chapter at the University of the Philippines, who joined the mapathon, enjoyed it because they got to learn more about using MapContrib, which was the platform used specifically for the project. Unlike the iD editor for contributing to OSM, it provides a quicker way to add information without having to trace the individual buildings. Moreover, the students were glad to participate in this project as they stated that they were able to contribute to the map data in the comfort of their homes (Fig. 7.2).

Meanwhile, the Bangladesh Government ran a monthlong campaign in April 2020 named "Bangladesh Challenge" with the objective of encouraging Bangladeshi youth to mark emergency and important locations known to them. Through this initiative, people contributed information on the location of pharmacies, hospitals, clinics, recharge points, and other important landmarks on the Google map and OSM and through the Bangladesh Challenge's website. During the lockdown, it helped engage people for a greater national cause and to fight the COVID-19 pandemic by getting emergency supplies using the map.

Most YouthMappers from Bangladesh contributed to update all the amenity data around health centers. Over 60 members of the YouthMappers chapter at Dhaka College contributed to this project. They played a vital role in updating data and received recognition from the organizing government authority (Fig. 7.3).

Fig. 7.2 OSM PH's first mapping initiative during the pandemic focuses on mapping the health facilities in the Philippines through OSM

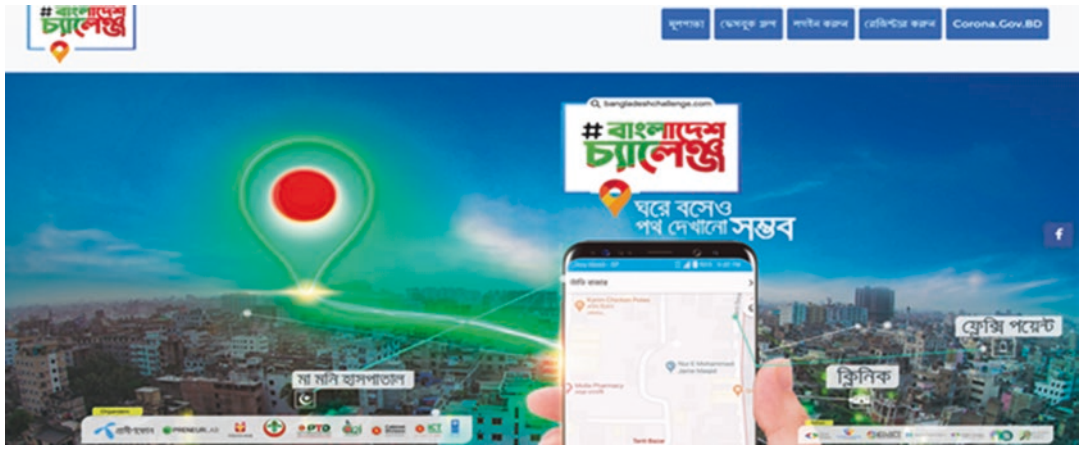

Fig. 7.3 Campaigns publicize mapping on personal devices

4.2 Mapping Essential Services

In addition to mapping health services and facilities, mapping essential services such as supermarkets and groceries, local wet and dry markets, water-refilling stations, shops, and restaurants that remained open during the lockdown was necessary as this information was not readily available to the public. Mikko Tamura, MapBeks founder, led this initiative and partnered with different organizations including Map the Philippines, Ministry of Mapping, University of the Philippines Department of Geography, Grab Map operations, MapBeks, and OpenStreetMap-Philippines to carry out this crowdsourced mapping project. YouthMappers at the University of

Fig. 7.4 A mappy birthday party aims to map the open stores and essential facilities during the lockdown while celebrating Mikko's Birthday

the Philippines and volunteers enjoyed participating and contributing to the project since this event was a combination of a mapathon and a birthday celebration despite having to participate remotely because of the lockdown (Fig. 7.4).

4.3 Mapping Residential Households

As COVID-19 active cases rise in the Philippines, specifically in Quezon City of Metro Manila, the University of the Philippines Resilience Institute (UPRI) collaborated with the Humanitarian OpenStreetMap Team (HOT)-Philippines to map the building footprints in Quezon City. The OSM building footprints were used by UPRI to develop a data-driven analysis and recommendation to the local government unit of Quezon City for the city's pandemic response. The HOT-Philippines team created a project in the HOT Tasking Manager to make it accessible to anyone who is interested in contributing to mapping Quezon City. UPRI needed the completed building footprints before June 2020 to provide analysis and recommendations for the national government in deciding whether to downgrade the quarantine restrictions over the country's national capital region. However, it was especially difficult for the mappers and validators of this project, including the YouthMappers chapter members and volunteers, to complete it before June as the city is one of the most densely populated in Metro Manila. It took the 644 volunteers to completely map and validate the buildings in 62 days. The whole mapping and validation process ended on June 25, 2021.

From this project, we realized that it was difficult to compromise between the quality of data and meeting the deadline. As information is critical during crises like the pandemic, making decisions based on flawed or incomplete data may cause inability to accurately assess the current COVID-19 situation. Poor data input leads to poor decision-making and can have a direct impact on the state of the local communities (Fig. 7.5).

5 Chapter Contributions in Response to Climate Change

Now the world is experiencing different types of natural hazards because the climate is changing. As mappers, we cannot directly reduce climate change but can help minimize it. Unplanned urbanization and industrialization are the main reasons for climate change. Many vulnerable and disaster-prone areas in the world are unmapped. Coastal areas, islands, hill tracts, and disconnected remote areas remain incompletely mapped. For this reason, the people of communities in these vulnerable areas are always at risk, so community mapping is a must.

Disasters are a common phenomenon in Bangladesh. Among the different disasters, floods are one of the biggest threats for people who are living in coastal areas, near the rivers,

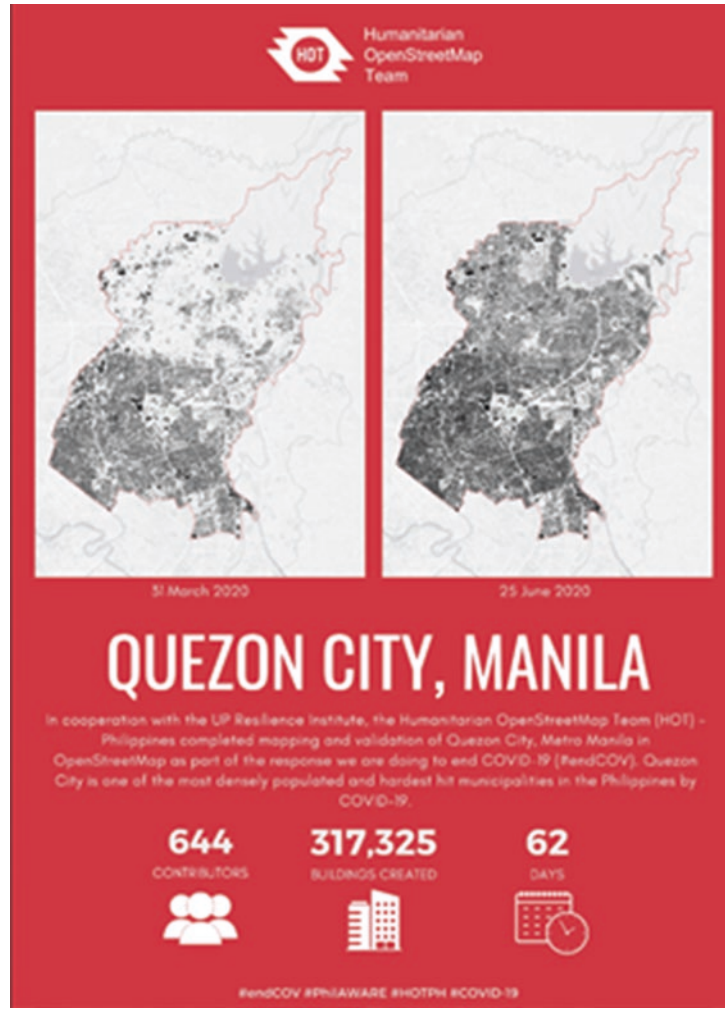

Fig. 7.5 HOT-Philippines' PhilAWARE Project helps to advance building footprints mapping in Quezon City

and on islands. With the support of the International Federation of the Red Cross (IFRC) and Bangladesh Red Crescent Society, different projects are being organized in these areas for disaster risk reduction, preparedness, and resilience. In Khasbaroshimul, Sirajgang is a flood-prone small island on the Jamuna River. Student mappers from YouthMappers Dhaka College visited this small island beside the Jamuna River, under the Sirajgang district of Bangladesh, to map that area. We visited the place and mapped the area by using GPS and field papers and collected data door to door with the support of the local community. We worked with local community leaders to form a group of community mappers and train them because when community members map areas, they provide real data and also become aware of their blind spots and need for resources and safety areas.

We collected data about each household, its condition (based on flood lasting and floor height), material, level, and address. Community members indicated important places like schools, cyclone centers, mosques, and others. They also marked the river erosion areas and drew roads and paths and indicated where the roads and embankment were broken and specific locations where floodwater entered localities easily in a community collaborative map. Mappers tagged important points such as water entry points and also added some special tags about flood signals, community disaster response team (CDRT) members, doctor offices, veterinary clinics, and the location of datri (midwives). According to its

geographical location, mappers marked this area as flood prone. Most of the people are farmers and day laborers and are struggling for their livelihood. They need more support, and after updating the data, a clearer picture of the needs and struggles of the community is visible. Because community members participated in the collection of this data, the data accuracy level was 100%. Once uploaded to OSM, as a public good, anyone is able to see and use the data.

6 Digital Innovation During a Pandemic

It is essential to develop methods, technologies, and innovations quickly in times of great pressure like disasters and the pandemic. This preparedness is part of building resilience as much as it is part of advancing toward the SDGs. The pandemic has illustrated that tools and geospatial data should always be readily available as decision-makers quickly need information for analysis and policy-making purposes. As volunteer student mappers were not allowed to conduct fieldwork to collect exact locations and additional relevant information of the health facilities and essential services because of the risk faced by the pandemic, various local communities developed creative and resourceful ways on how volunteers can contribute to OSM despite having no prior experience on mapping and to ensure that the data being ingested in OSM are accurate and correct.

7 Future Outlook, Collaboration, and Engagement

All types of work are possible by collecting, uploading, and using OpenStreetMap data. Development work, disaster preparedness, relief distribution, rehabilitation, resilience, health, and medical support can be enhanced through the incorporation of crowdsourced, open data. Throughout the pandemic, we have observed efficient and effective collaborations between the different local mapping communities and local YouthMappers chapters to deliver critical information that can be used by the local community and the general public. This specific time during the pandemic has been a great example of what resilience means and how much we can achieve and help local communities.

References

Anderson, J. (2022). YouthMappers Activity Dashboard. https://activity.youthmappers.org. Cited 6 May 2022

Rodin J (2014) The resilience dividend. The Rockefeller Foundation, New York