Bhutan Team

Case study in progress from the KIX-EAP learning cycle "Equitable Access to Education with Geospatial Data" held in collaboration with IIEP UNESCO

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About case studies in progress

This case study in progress was drafted by a national team that participated in the KIX EAP Learning Cycle: Equitable Access to Education with Geospatial Data. Case studies in progress are ongoing and incomplete studies. As such, the KIX EAP Hub/ NORRAG does not guarantee the quality of the work nor the accuracy of the data.

The KIX EAP Learning Cycles are supported by the Global Partnership for Education (GPE) Knowledge and Innovation Exchange (KIX), a joint endeavour with the International Development Research (IDRC), Canada. The findings, interpretations, and conclusions expressed in the Learning Cycle outputs do not necessarily reflect the views of the KIX EAP Hub, NORRAG, GPE, IDRC, its Board of Governors, or the governments they represent.

About the KIX-EAP Hub

The Global Partnership for Education (GPE) Knowledge and Innovation Exchange (KIX) is a joint endeavour with the International Development Research Centre (IDRC) to connect expertise, innovation, and knowledge to help GPE partner countries build stronger education systems and accelerate progress toward SDG 4. There are globally four KIX hubs or Regional Learning Partners, overseen by IDRC. The hub functions as a regional forum within KIX. NORRAG (Network for International Policies and Cooperation in Education and Training) is the Regional Learning Partner for the KIX Europe Asia Pacific (EAP) hub.

The KIX EAP hub facilitates cross-country knowledge and innovation exchange and mobilisation, learning, synthesis, and collaboration among national education stakeholders in 21 GPE partner countries in the EAP region. The hub also offers opportunities for peer learning and exchange by means of professional development and inter-country visits.

About the KIX EAP Learning Cycle Equitable access to education with geospatial data

This case study is a result of the KIX EAP Learning Cycle "Equitable access to education with geospatial data". Organised by NORRAG and the UNESCO International Institute for Educational Planning (IIEP), this professional development course ran from 15 June to 16 July 2021. Across 5 weeks, this Learning Cycle enabled participants to apply basic mapping techniques on a geographic information system (QGIS), understand the geospatial dimension of educational planning and management, and challenge the different aspects of equitable access to education by harnessing the power of geospatial data in their daily work. 10 national teams from Afghanistan, Bangladesh, Bhutan, Cambodia, Kyrgyz Republic, Maldives, Moldova, Pakistan, Papua New Guinea, and Sudan took part in this Learning Cycle.

Contents

1. Equity in Bhutan

Key legislation on Equity

The Constitution of the Kingdom of Bhutan mandates the State to provide education to improve and increase the knowledge, values, and skills of the entire population for more holistic development of human personality. Considering that education is also recognized as a fundamental necessity, efforts are being put globally through a series of strategic interventions including EFA, MDGs, and currently Sustainable Development Goal 2030 to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. Given the fast-changing scenarios globally, the need to harmonize the national needs, address emerging challenges, and prepare in line with global trends has become critical.

Identification of key variables

For this report, the team identified the following key variables:
1. Access to education: Bhutan is close to achieving universal primary education with the Adjusted Net Enrolment Rate at Primary standing at 99.7 percent as of 2020. This has been accelerated by the expansion of educational facilities and support mechanisms over the years. However, challenges continue to remain in providing access to hard-to-reach areas, providing inclusive education, and improving the quality of education.
2. Location of school: A total of 600 schools are sparsely located across the country.
3. Flood Risk area Data: Data on a few areas that are at risk of flooding.

Identification of educational level

The school-based education structure in Bhutan comprises 11 years of free basic education from classes PP to X. From 2918, with the initiative of the government, all class X passed students are provided scholarships to pursue their higher education in government and private schools. The General Education structure comprises seven years of primary education (PP-VI), and six years of secondary education (VII-XII). After the completion of grade XII, students can either continue their studies at the tertiary education institutes within the country or opt to study abroad. The Government provides a number of ex-country scholarships to pursue higher education

2. The School Map for an Educational Level

Fig 1. Map of school location and road accessibility
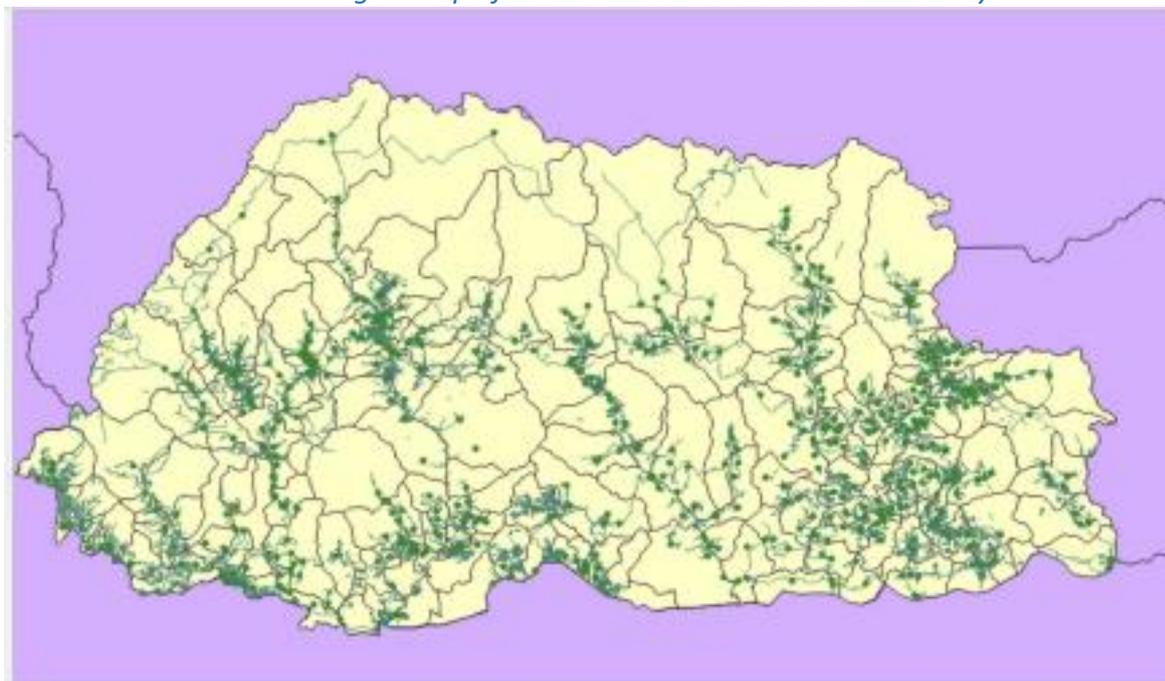
The green dots represent the school locations across the country. Administrative boundary level 2 is represented by the black borders dividing the sub-districts. The green lines represent the road network in the country.

Using the above map, we are able to find out the schools that do not have access to roads which can potentially disrupt the supply of quality education. We are able to pinpoint the schools in each sub-district that are away from and do not have access to roads. We can cross-check the findings through the latest google maps data and relevant district education officials.

*Fig 2. Map of Bhutan showing 5km buffers around each school*

This map shows the school locations with 5km buffers each. It shows great potential to be used with relevant landscape and population data to figure out school accessibility for out school
going-aged population. The team hopes to take the learning from the training further and make better use of isochrone methods taking into account the various rivers, landscape, and road
availability to better measure accessibility.

Fig 3. School situated near rivers
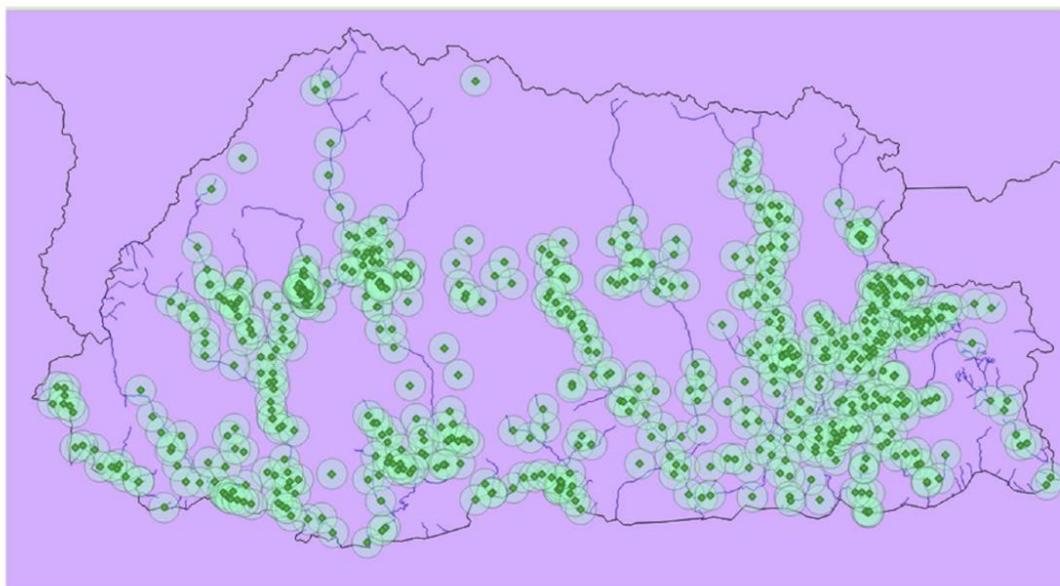
Fig 4.Schools at risk of floods in Bhutan district
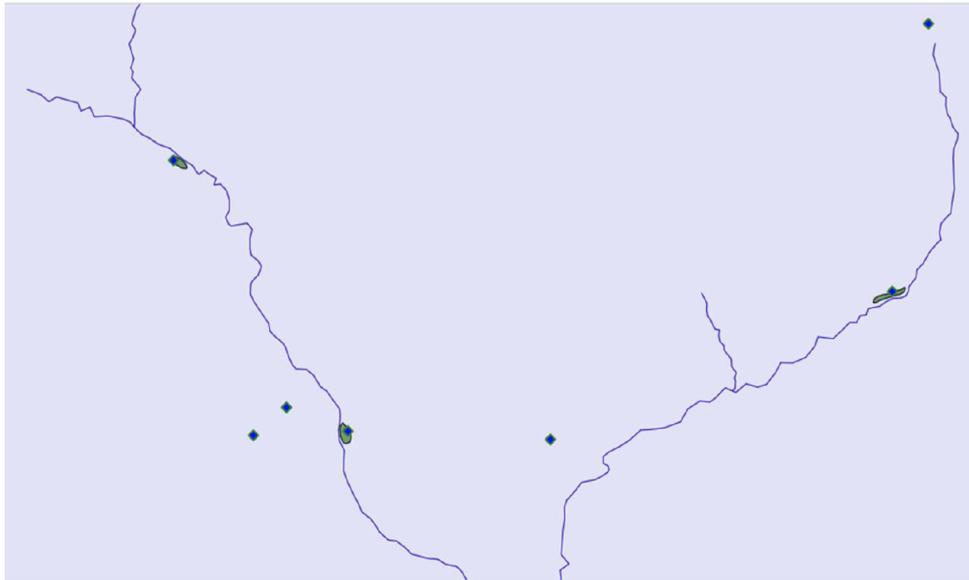
Creating a layer using the flood risk data imported from the KMZ file along with the school locations data, we could identify which schools are prone to and near flood risk areas. This is a huge step towards better disaster management. It has enormous potential in ensuring the safety of our learners and safe learning environments.

Fig 5. School locations and school going children
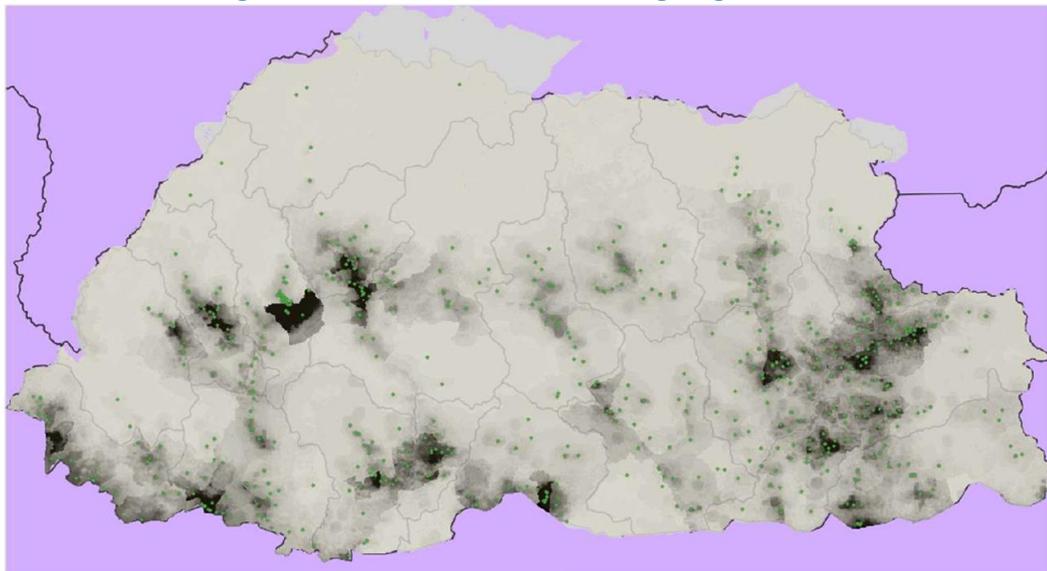
In this map, the green dots represent the school locations in administrative level 1 which represents the 20 districts of Bhutan. The population data is imported from: https://www.worldpop.org/geodata/summary?id=16816. The raster representation of population represents density per 100x100km per pixel for the population aged 5-20 years. Unconstrained population data has been used due to the lack of proper population data available and collected. The above map could

be achieved by using the proper layer styling. The team hopes to collaborate with national statistical agencies to acquire accurate and reliable data.

Fig 6. Schools with 5km buffers and density of school-aged population
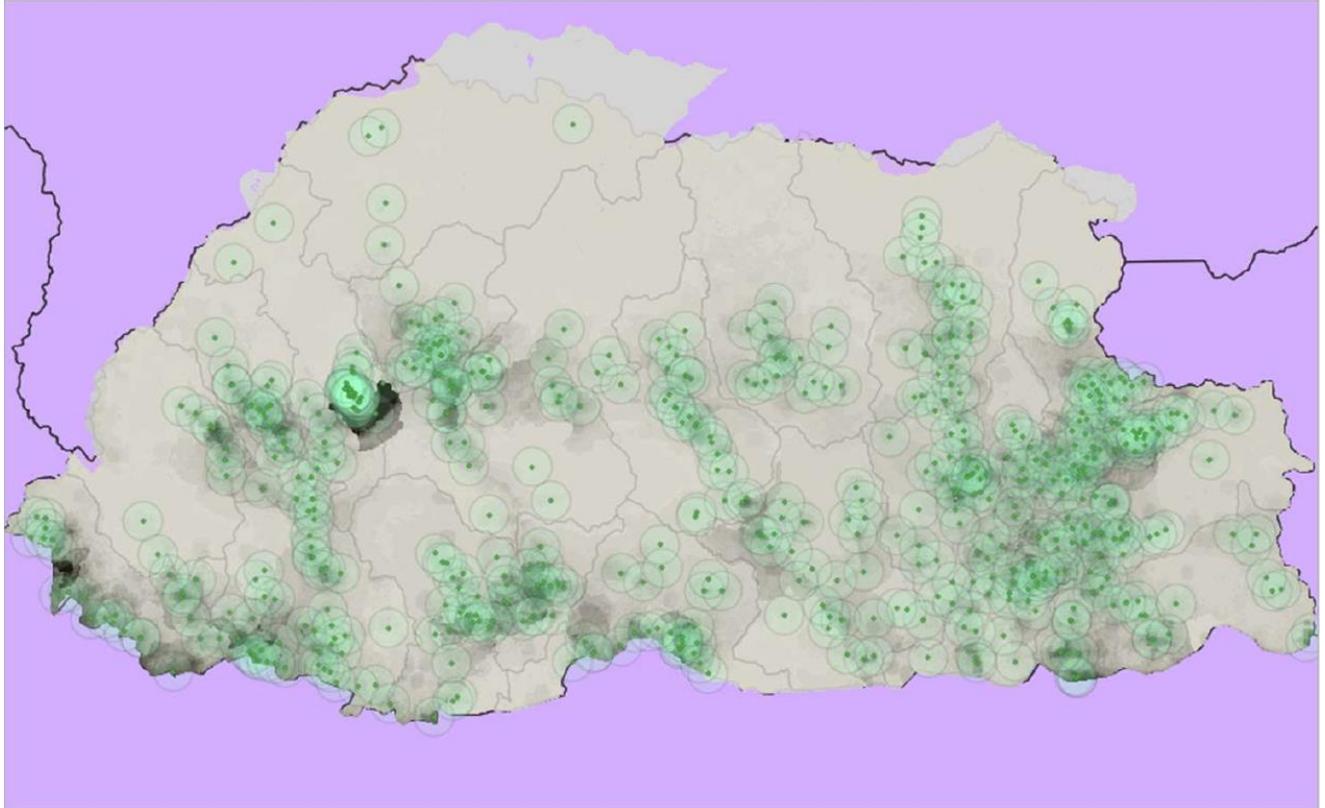
The map shows a 5km buffer around each school along with population data for school-going population to get a better idea of the accessibility and efficiency of school locations. The administrative boundaries are for the district level.

Barriers to demand for Education

Bhutan is fortunate that it does not face any sort of barrier to demand for education in particular but the following factors may minorly affect it:

- The distance from home to school
- Availability of schools (especially in rural areas)
- The infrastructure facilities available at schools.

Challenges

The limited availability of data, especially population data, and the lack of expertise and knowledge are a challenge to utilizing geospatial data.

3. Conclusion

We would like to very much extend our appreciation to the IIEP team UNESCO for facilitating such an informative online course with lively sessions and expert support. We all agree that the use of geospatial data in education planning can do wonders in terms of resource allocation, tracking progress, and ultimately ensuring equitable and quality education for our learners. The course has opened our eyes to the future of planning by familiarizing us with the QGIS software and acquainting us with its interface and field of geospatial data. We hope to build on our learning and be able to utilize geospatial data to its fullest.