



REIMAGINE SOIL TESTING

NXplorers students from the Philippine Science School investigated soil analysis and how to improve the way farmers receive this data, with the ambition of helping farmers across the world increase their crop production. Their proposed solution contributes to achieving Sustainable Development Goals (SDGs): sustainable cities and communities, responsible consumption and production, and life on land.



Shell
NXplorers

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The team, hailing from the agricultural province of Isabela, decided to create a smart device to help farmers optimise their crop production by gathering and analysing soil data and providing recommendations for further improvements.

Isabela is the country's top yellow corn producer, accounting for 21% of production. This focus on crop production inspired the team to investigate the pressing problems faced by farmers in the area. Covid-19 hit the Philippines particularly hard, and food and relief measures were in short supply in many areas. As stated by the Food and Agriculture Organisation of the United Nations, agriculture provides work for around 40% of Filipino residents, and farmers were risking exposure to the virus by leaving their homes to farm or sell their produce to continue to earn a living.

RETHINK CLIMATE CHANGE EFFECTS

Utilising the NXplorers toolkit and methods, the team found out that a major challenge for farmers in the area was the effect of typhoon floods, including the destruction of crops and soil degradation. This causes the soil to lose nutrients which then leads to a cycle of unhealthy plants and poor production for the coming harvest.

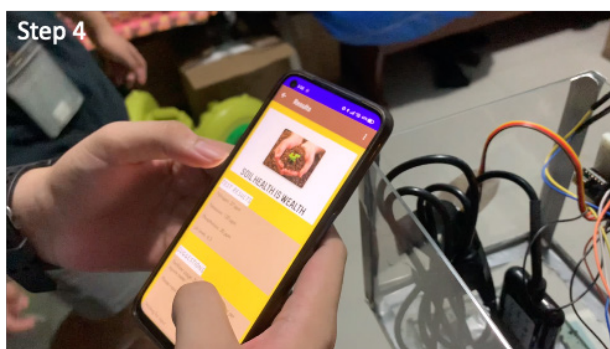
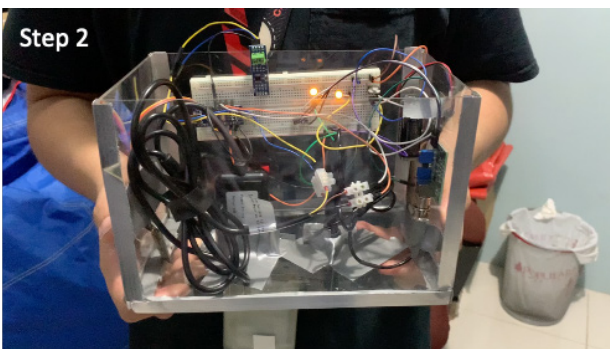
With the Department of Agriculture in the Philippines announcing that "they are targeting a 2.5% growth in agriculture this year" the team's idea is more important now, than ever. The students saw that farmers had little knowledge about the importance of soil testing in preparation for crop production. They wanted to design a device that informed farmers of the composition and viability of the soil on their land, as well as ways to enrich it.

REDESIGN SOIL ANALYTICS

By applying the NXplorers problem-solving approach, the students decided that their solution would be to create a smart device that allows soil data to be gathered. And so the idea for PogSOILbok was conceived. They obtained sensors and, without much instruction as to how, used them to construct their device.

The device is synced with a mobile app where the results from the soil analysis are shown and shared with the farmer. The mobile app also acts as a centralised server for the data collected from the PogSOILbok. Powered by solar energy, the device will measure the chemical composition of soil within fifteen minutes, enabling farmers to react quickly to the solutions offered by the app. The app will also connect farmers with suppliers of agricultural products in a 'marketplace' function.

The team has discussed the idea of introducing a messaging feature for future development.



This feature would be used for online consultations with farmers and agricultural experts, to further help the Filipino farmers gather a better understanding of their land and how to increase crop production.

Unfortunately, due to the pandemic, the prototype of the device has not been made yet. Some team members were unable to work together in person so had to do much of their innovative work via video calls and messaging.

RETRACE THE ROOTS

The team's original aim was to help farmers overcome a significant problem across the country. Focusing on that goal "motivated us to work harder and smarter in such a short amount of time". The mindset of the team was crucial to tackling the problem head on, despite the challenging circumstances in their

country and the world around them. The project allowed the team to express their views, develop their decision making and be active changemakers.



CONCLUSION

The team see themselves as "blessed" to have worked together and with NXplorers facilitators - they have all helped each other grow an idea, and a sense of success and innovation. The pogSOILbok is yet to be created, but with the help of the NXplorers facilitators the students can take their research forward and create their product to help those who rely on good soil quality.

HOW THIS PROJECT CONTRIBUTES TO THE UN SDGS

2. Zero Hunger

This solution will help in crop production, taking into consideration the nutritional needs of the community.

8. Decent work and economic growth

This solution is based on the aim to give farmers across the country good crop production rates and help them sustain employment and financial stability.

12. Responsible consumption and production

This solution encourages sustainable production by identifying key areas of improvement rather

than overproduction or fertilisation with harsh and hazardous chemicals.

15. Life on land

This solution helps to save soil from degradation after natural disasters or incidents occur.

