Cheap and easily-buildable mobile weather stations being tested here

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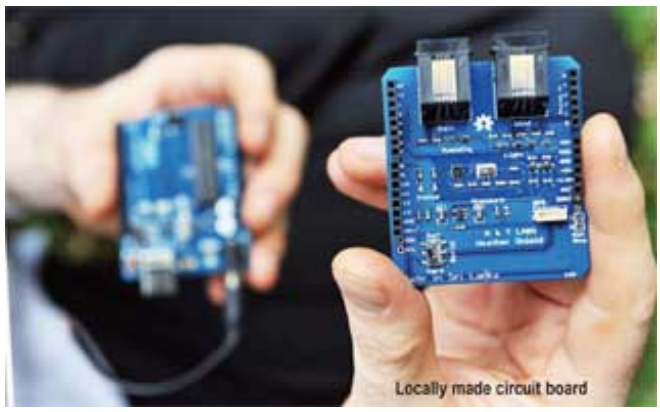
Locally made circuit board

by Randima Attygalle

When the French scientist Dr. Yann Chemin during a visit to the southern Sri Lanka was trying to protect himself from "being cooked like a lobster," with not a cloud above him, his app on the phone gave him quite a bewildering weather report.

"I was baffled as to how it could be cloudy and raining (according to the weather report) when actually it was baking-hot," he remarked.

The idea of increasing the number of weather stations in the country, thereby enhancing the accuracy of weather reporting, was conceived as a result by Chemin, a scientist from the International Water Management Institute (IWMI), Sri Lanka. As he says, "the need is simply overwhelming."

Warning systems

His solution was low-cost portable weather stations known as Mobile Weather Stations, produced by locally sourced material, costing only around USD 250 each. Being low priced makes the device applicable at various irrigational levels, observes the scientist.


Dr. Yann Chemin a Mobile Weather Station

"To set up a large scale weather station it would require a minimum of USD10,000 and standard devices certified by the World Meteorological Organization (WMO) are expensive to maintain as they entail high precision technology; but for local agricultural work you need not have that precision. What is crucial on a local scale is to know is the intensity of rainfall."

These mobile weather stations provide useful information for farmers, fishermen and disaster management officials. They also act as warning systems for floods and landslides.

We have a very high variation of rainfall in terms of location. "In Colombo alone, while rain is intense in one part, the other side doesn't get a drop." Such extreme variations in weather, especially rainfall, makes it challenging to predict natural disasters accurately which claims many lives and properties each year and increasing the number of weather stations or localizing them could give better and clearer clues as to when and where the rainfall is reaching dangerous levels, thereby preventing catastrophes.

From 2004 to 2014, we have experienced 23 flood occurrences with nine million affected. The economic loss of these floods had been around USD 1 billion.

Technology of public domain

The mobile weather station which was no more than ‘hobbyist’s technology’ so far was far more a serious one in Chemin’s eyes. He was the first in Asia to consider it a real tool to help people.

"It is serious depending on how you device it. You can make a simple mobile station which can give an accurate prediction as we need them to be or put an engineer on it to further develop it," says the scientist who considers the know-how as something belonging to the ‘public domain.’

Local trainings on technical knowledge have already commenced and two such sessions were held last year with the Department of Irrigation- one at engineer level and the other at field officer level. Chemin also welcomes any individual or an organization to share this knowledge of production with him.

"This is meant for people and there are no restrictions attached to disseminating knowledge." However, production of it not something the scientists could take of although primary technology is shared, asserts Chemin who encourages locals to pursue the production as an SME which could generate job opportunities as well.

Low cost production

The production cost of these mobile stations is very low and parts are easy to be sourced and replaced. In fact Chemin has built the first prototype with most of the materials purchased from Pettah. The circuit boards were produced by a local electrical company. The stations are powered by a single solar panel, connected to a standard motorbike battery and a charger.

"While local blacksmiths could easily produce the metal structure for the device to stand on, any electrician can fix a power-related problem", enthuses the scientist. Eighty percent of the components can be locally produced and only the sensors together with the plastic housing need to be imported.

The stations are equipped with an atomic clock to give precise time and data readings and a GPS (Global Positioning System) sensor which updates automatically if they are moved. A system of connecting this data to the local mobile phone network through SMS’s is also underway.

If a large network of weather stations is set up in the island, information it produces could be sent to a central database and in the event of heavy rains, automated SMSs could alert those in areas prone to landslides. Such warnings could also alert irrigation officers in charge of tanks to prepare for intense flows of water into the tank system thereby preventing floods. "It’s all about saving human lives and mitigating the damage on the irrigation system and other infrastructure."

Enhancing ‘weather literacy’

Currently there are three mobile weather stations being tested in the North - two with the Irrigation Department and the other with Mahaweli Authority. The Meteorological Department is also to test another station shortly.

"Lanka Rain Water Harvesting Forum which is one of our long standing partners is also engaged with us and right now we are building a mobile weather station for their Centre for the benefit of the school children," observed Chemin who stressed on the importance of enhancing ‘weather literacy’ among school children, given the fact that they would be the future activists in the struggle against global climate change. A dialogue with local university professors has already been opened by the scientist in this regard.

Mobile weather stations have already created waves in the region with certain Indian SME stakeholders coming forward to develop them locally. "This is the good thing of making the designs open-source, so that we could give the public the power of customization," says Chemin who invites interested parties to access the open source development guide available on IWMS website.

As a scientist and a researcher exposed to diverse Asian cultures for the past 18 years, Chemin views Sri Lankans as not only a clever nation but very practical. "They can pick up things fast and they are very realistic, the reason why I see a lot of potential for them to take strides in this new technology as well."

(Photo Credit: Neil Palmer, IWMI)