A low cost, water quality monitoring system for the Ayeyarwady river in Myanmar using participatory approach

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The Ayeyarwady River is the main river in Myanmar providing water resources for irrigation, agriculture, fishing and drinking , at the same time, it serves as one of the most important transport corridors. Contaminants from industries, agriculture, mining and communities are a real threat for the river water quality. Thus, water quality monitoring of the Ayeyarwady is vital to safeguard it as water resource. Currently, there is only limited amount of data on water quality available, despite of the obvious need. The main purpose of our project is to setup a multi-objective surface water quality monitoring program taking into account the current socioeconomic situation of Myanmar. Therefore, our research investigates using a participatory approach with the help of mobile phone applications to measure water quality with a limited number of high-end sensor and laboratory measurements.

Building a monitoring water quality of such a large river system is a huge logistical, organisational and financial investment. At the same time, raising awareness of the importance of good water quality with the general public and local authorities, is very important. Citizen Science could help reaching both goals. Citizen Science is basically the participation of local stakeholders participating in research designs, data collection, data interpretation and reporting or in some parts of it. Many promising Citizens Science projects around the world exist and recent developments of smartphone application to measure rainfall, water levels, water and air quality to name a few, is boosting these initiatives further.

We designed a quality analysis of a smartphone application used by volunteers to measure synthetic water samples in laboratory setting. We tested and compared automatic interpreted colour reading with direct visual reading of volunteers. The results show that volunteers using the automatic water quality measurement using the mobile phone application perform better than volunteers doing visual interpretation of the strips.

After recruiting volunteers participants in Myanmar, 7 volunteers were trained and assigned each to one of the 5 stations on the Ayeyarwady and 2 stations on the Chindwin River respectively. Measuring and submitting the data by using smart phone applications and cheap test strips are done every Tuesday morning starting from March, 2016. For data quality control, monthly water samples are collected from all these stations and tested by using portable field photometer HI 83200. We will present and discuss the results of running this flexible, low-cost water quality monitoring for one year, and discuss future direction for water quality monitoring of the Ayeyerwaddy, Myanmar.