



THE ECOLOGICAL NODES

CITIZEN SCIENCE HAS LONG CONTRIBUTED TO THE HEALTH OF LOCAL COMMUNITIES BY MAKING PEOPLE AWARE OF THEIR ENVIRONMENT IN THE FORM OF ORAL HISTORIES AND TRADITIONAL WISDOM. RECENTLY, INTERNATIONAL OPEN SOURCE AND MAKER MOVEMENTS HAVE BEEN ACTIVELY ENGAGING WITH THE LIFE SCIENCES TO FOCUS ON THE ENVIRONMENT. THIS BROUGHT A REVIVAL OF THE TRADITIONAL KNOWLEDGE AS WELL AS AN OPPORTUNITY FOR INNOVATION AND A MODEL FOR PUBLIC PARTICIPATION IN SCIENCE. THESE ACTIVITIES ARE BECOMING INFLUENTIAL POLICY FORCES, CHANGING HOW WE PRODUCE AND SHARE KNOWLEDGE AS AN ITERATIVE AND COLLECTIVE PROCESS. YOGYAKARTA, INDONESIA, HAS BEEN ONE OF THE MOST ACTIVE HUBS IN THIS MOVEMENT.



Biorecovery of Volcanic Soil

There is wide-spread devastation following the 2010 eruption of Mount Merapi in Yogyakarta, Indonesia. The explosive eruption producing clouds of hot ash and other volcanic material caused a rapid drying to the soils around the volcano and covering the soil at about 50 cm thick. Later on, it creates nutrient poor volcanic surfaces. Previous research studies on the biodiversity of legume-nodulating bacteria (LNB) in three agro-ecosystem affected by Mount Merapi's eruption shows that LNB biodiversity levels were generally decreased. Therefore, an effort to restore the biodiversity of LNB for helping further plant growth in the destroyed soils is needed.

Several methods could be carried out to increase the biodiversity of LNB in the destroyed soil: Inoculating LNB in the soil, giving appropriate environmental condition for LNB growth (temperature, humidity, pH, and nutrient), and cultivating wide spectrum leguminous plants. Many tropical legumes can form effective nodules with a broad spectrum of rhizobial common to tropical soils were native legume are presents. Cultivating wide spectrum leguminous plants could be an effective method for improving the biodiversity of LNB in soil. The node aims to develop a research upon appropriate and feasible method to restore LNB biodiversity in the soil affected by Mount Merapi eruptions, using wide spectrum leguminous plants.



Biodiversity Conservation in Wonosadi Forest

Biodiversity Conservation in Wonosadi Forest Located in Duren and Sidorejo, Beji Village, Ngawen District, about 55 km from the city of Yogyakarta, Wonosadi Forest is one of the last natural forests in Java island. The 'heart' of the forest is a 800 meter-square plateau with four big trees that is believed to be older 500 year old. People say that there, at the center of the forest, spring flows all the time of the year. The forest is also famous for it is said to be a place that is full of secrets (in Javanese language, "wono" is forest and "sadi" is secret). From generation to generation, the unique story that is believed by the people is that a genie and other invisible inhabitants of the area (which is considered as the genie's soldiers) lives at the 'heart' of the forest and never interfere with the people living around the forest. It is also believed that these meta-creatures are required to help the people in preserving the forest.

The forest have always been protected by the local villagers and recently also by the Green Tech Community. In a way, protecting also means conserving. This node aims to document the diversity in the forest, by setting up a lab in the forest to explore the forest ecological system and research it in a nomadic style along with narratives and knowledge from people living in the area. The bold ambition of this node is to scientifically proof the local wisdom on the use of plants and its combination for better human life.



Environmental Monitoring of Yogyakarta Rivers

Jogja River Project (JRP) started as a simple initiative from a number of people who consider themselves as citizens wanting to explore their own rivers in the city. It all began with a morning walk on the riverside areas to explore and see what's going on around. There are three main rivers that pass through the urban areas of Yogyakarta: Code River, Winanga River and Gajahwong River. From gathering documentations (images, stories, etc), JRP has done several activities that involved cleaning the riverbanks from plastic waste, vegetation mapping, taking water samples, etc. The idea on how to conduct JRP evolved as Lifepatch started collaborating with Microbiology Department (Agricultural Faculty of Gadjah mada University), Cantigi (Green Tech Community) and other communities.

This node will focus on Code River where the people living in the riverbanks raise fish in the traditional 'keramba' (cage with floating nets to rear fish) even if the river has become polluted with plastic and other wastes that made seasonal flooding as a common issue. The coliform bacteria contaminations within Code River is also high. This node aims to enhance the relationship that JRP has built with communities along the riverbanks in order to disseminate the knowledge that have been gained both by the people through their experiences and by JRP through their curiosity and findings.

JRP is also one of the curriculums offered in Biodesign For The Real World, a collaboration between (Art)Science BLR, École Polytechnique Fédérale de Lausanne (EPFL) and Lifepatch.