The Effective Methods to Conserve Agricultural Waters
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Researcher of the Department of Civil and Environmental Engineering, Faculty of Agricultural Technology, Bogor Agricultural University, Prof. Budi Indra Setiawan, has introduced the technology to save water during the drought. The technology is a earthenware pitcher irrigation system on croplands in anticipating the drought in a prolonged dry season. Nevertheless, the porous clay pots that have been practiced in some arids and semi arids regions is being overlooked by the government as a project that could assist farmers. "The porous clay pots and pipes are a means of water application that conserve water by applying water directly to the roots of plants, thereby limiting evaporation losses. Drought suffered by secondary croplands or rice fields is generally caused by not optimal water management (water management) during the rainy season so that water shortages during the dry season, "said Head of the Department of Water Resources Engineering Bogor Agricultural University at the Coffee Morning Publikasi Keunggulan IPB, on Wednesday, 21 September 2011, at Darmaga Campus.

Coffee Morning is the routine activities being held by the Public Relations and the Protocolair Section of the Executive Secretariat as a platform for the publicity or socialization any achievements and special events of the University to the general public. Pitcher irrigation system had been introduced to community at large since a few years ago and it was booming around the year 2008. During which Budi got idea to produce pitchers utilizing Lapindo mud of Sidoarjo. " The study on pitcher irrigation was begun since 1996. Once the idea was introduced to the public, then problem arises as how to get continues supply of raw materials for the pitchers. “However, when Mud Tragedy in Sidoarjo (Lapindo) happened, I think it would be the best potential of raw material for pitcher," he said.

Since its introduction to the public, several countries, especially the dry areas to show their interests and have implemented this system. "Somehow, we (Indonesia) was not even interested in implementing this system," continued Prof. Budi. Pitcher irrigation system, said Budi, is very efficient as the water will absorbed entirely by plants and nothing is wasted. The system is implemented in a simple, i.e., by immersing a pitcher of water on the ground. When the pot is filled with water, the natural pores in the pot's walls allow water to spread laterally in the soil, creating the moist conditions necessary for plant growth. Pitchers are filled as needed, maintaining a continuous supply of water directly to the plant root zone. The pitcher is made of clay and other materials so that the water is capable to ooze out into the roots of plants. The pitcher is filled with water through a pipe which is connected to the barrel of water. Pitchers are filled as needed, maintaining a continuous supply of water directly to the plant root zone. The pitcher’ wall was designed in such a way to enable water seeps into the root zones through the joints for crop evapotranspiration at any time and with due regard to the soil hydraulic properties as well. "Even the top soil is dry, but the plant roots stay wet due to filtration of water from the pitcher," he said.

As explained by Prof. Budi, pitcher irrigation system is designed with various considerations one of which is to keep the water actually provided in accordance with the needs of plants, and avoid water loss through evaporation. There are two methods of water replenishment

systems, namely manual and automatic. Manual method will be taken if the number of pitchers is limited or the abundance of workforces. Wherease, the automated method is based on the Bernoulli's equation in fluid dynamics, on the one hand using a pitcher and on the other hand is a tank of water sources. Both are connected by pipes or plastic hoses. As for rice fields, Prof.Budi provided solutions to grow rice intensification system with irrigation water. The seedlings of the rice plants should be younger and they should not be soaked in water as farmers regularly practiced today. "Treat the soils as mush as such, thus, the roots can get oxygen adequately as the soil is not saturated with water," he said.

Further, Prof.Budi stated that the method has proven to save water by 40 percent. It means, with the planting time of about three to four months, the management of irrigated water will enable farmers to overcome the dry season which lasts two or three months. With this SRI system, 1750 mm of water could irrigate paddy fields to produce about eight tons. Although this system ensures the availability of water during the dry season, however, not many farmers utilize this system. Prof. Budi affirmed, that these two systems are actually very dependent on the management of water or rain harvesting. That is, during the rainy season, farmers should store excess water in certain places (dams) that can be used during the dry season. Hence, the current existing infrastructures seem won’t be able to anticipate the dry season. As a result, the reservoir uncapable to store the excess rain water, thus no water is available in the dry season. "The construction of irrigation should estimate correctly the water demand for the dry season. In the peak dry season if the irrigation is dry, then the irrigation seem fails to function," continued Prof. Budi. (Wied).