Groundwater Development for Agriculture and Sustainability: Phong-Kae Area, Phitsanulok Province

Nisa Kantiya[1*], Jiraporn Nuangchaiyot[1], Peeranad Polanrat[1], Weerasak Karin[1]

Department of Groundwater Resources

***Corresponding Author(s):** nisageo22@gmail.com, ny.jiraporn@gmail.com

Phitsanulok Province has agricultural areas. the most of mango farms, and agricultural areas outside the irrigation area and must rely mainly on rainwater The abundance of agricultural products depends on the amount of rainfall each year. It has an impact on agricultural production, causing farmers to have uncertain income. Debt situation and investment risks arise. There is no stability in agricultural careers. Agricultural production sector. Farmers in the Phong Kae area suffered from water shortages for Agriculture such as mangoes during the dry season. Accordingly, the Department of Groundwater Resources has operated groundwater development project for large-scale 300 rai (0.3 square kilometers) in the Phong Kae area to provide groundwater supply and encourage the farmer's group to participate in groundwater management for large-scale agriculture. This study aims to application of evaluate groundwater potential of large-scale agriculture area and assessment the value of the water distribution system model and the balance between groundwater demand and groundwater potential for large-scale agriculture

The principles of groundwater development for agriculture in the study area to be sustainable. The first step is a problem analysis has been carried out and including designing guidelines for solving problems then project implementation planning, water Distribution Pipeline determination and project monitoring and evaluation by stakeholders in every sector, including government agencies (DGR), local government agency and the local water user sector. Ban Phong Kae, Thameunram subdistrict, Wang thong District, Phitsanulok Province which has been carried out in 10 steps as follows: (I) Project area selection. (II) Survey and discussion. (III) Groundwater exploration using vertical electrical sounding (VES). (IV)Groundwater well drilling and development. (V) Site planning survey and water distribution system design. (VI) Aquifer pumping test. (VII) Groundwater quality analysis. (VIII) Water distribution system construction. (IX) Groundwater development project delivery. (X) Report and conclusion.

As a result of the project, at least 300 rai of benefiting areas, farmers benefit 37 households, able to develop groundwater to support agriculture at least 68,040 cubic meters per year. It also encourages farmers to access funding from the Bank for Agriculture and Agricultural Cooperatives in accordance with the Memorandum of Understanding on promoting and supporting groundwater use for sustainable agricultural development between the Department of Groundwater Resources and the Bank for Agriculture and Agricultural Cooperatives.

Keywords; Groundwater Development, Agriculture, Sustainability