Remote Sensing and GIS Applications For Agriculture and Precision Farming

Rice Management Indexes Study Using WMSN

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ABSTRACT

Rice quality is affected by many factors such as variety, fertilization, soil water content, climatic temperature and humidity, length of sunlight, etc. in the different rice growing periods, and the appropriate management of the paddy field. Taiwan is the lowest latitude area in the world that can grows high quality Japonica rice. However, new cultivar maybe needed to breed because of global warming. Rapidly evolved information and communication technology (ICT) in recent years as well as continuously and fast built enormous data resources in the Internet construct a platform which can develop applications to coordinate distributed resources and heterogeneous information. Field server is one of such technology for agriculture to construct paddy field sensor grid to help improving rice quality, for such as: 1. Understand the characteristics of rice growing climate of different rice cultivation areas in Taiwan; 2. Study physiological growth pattern and quality indexes of different rice cultivars; 3. Clarify the relationship between quality formation and climate factors in the areas which produce high quality rice. In this study, a paddy field wireless multimedia sensor network (WMSNs) system was constructed for continually monitoring and collecting the multimedia data of growing rice and correlated environment from managed paddy fields. Statistical analysis was used to study and build the rice growing indexes correlated with fertilization, temperature, irrigation, etc. This work also demonstrate the benefit of using the system that can help farmer to improve their production management model to produce quality rice for the present days, and can help researchers to develop new cultivar for the future warmer years in Taiwan.

Keywords: Rice quality, paddy field monitoring, agricultural information system, sensor grid, WMSNs