Preliminary Study on ICT Applications in Agriculture to Enhance Information System using Mobile Crowdsensing

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This study analyzed the existing Information and Communication Technology (ICT) applications in the agriculture information system and proposed a method to enhance a mobile-based information system using mobile crowdsensing. The proposed system enables farmers in Sri Lanka to report events such as diseases, about their crops and get advices for making farming decisions. The lack of real-time information environment makes issues in the farming life cycle and that will affect the national economy and employment. Existing studies were analyzed for identifying the capability to establish a mobile-based information environment in the farmer-community in Sri Lanka. The applications introduced in the studies are covering several aspects such as market price, vendors, crop details, pest and disease information, etc. In order to create a real-time information environment, the real-time data related to farms need to be collected. Mobile sensing is a technique to obtain real-time data from a large group of individuals. Thus, the mobile sensing technique introduces for the farmer-community that allows farmers to participate the system by sharing mobile sensing data like images, text, voice, location, date and time. The knowledge-base of the system contains knowledge about crops, diseases, pests, fertilizer requirements and control methods for growing problems. Thus, the agriculture information in the knowledge-base can be accessed by the farmers according to the shared sensory data. Over the time period, agriculture information can be updated as the technology advancement, seasonal changes or unexpected weather changes. Thus, new knowledge needs to be stored in the agriculture knowledge-base with the help of domain experts. Moreover, by reasoning the collective data shared by farmers and experts, interesting aspects like the suitable crops to grow in a particular area, the crops badly affected by a specified disease in a particular area or treats rapidly spread in a particular period, etc. can be obtained for decision making. Further analysis can be done for future predictions from the large collection of data.

Keywords: Knowledge-base, Agriculture, Mobile Crowdsensing