Smart irrigation monitoring and control for improving water use efficiency in precision agriculture

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Vision

- What will the technologies realize? Provide a sustainable solution by automatic monitor of water-drip irrigation process by using Internet of Things (IoT). The intelligence of the proposed system is based on a smart algorithm, which considers sensed data along with the weather forecast parameters like precipitation, air temperature, and Soil Moisture Sensor.

Issue to solve

- What are the problems? The cultivation of strawberry requires the irrigation. New leaf production, stomatal conductance, and photosynthetic rate were significantly reduced under limited water which could reduce plant growth compared with well-watered plant.
- Who has those problems? The strawberry plantation areas in District Garut, West Java, Indonesia which had an altitude of 1400 meters above sea level.

Technology features

- Smart drip irrigation can reduce the risk of illness in the strawberry lower than overhead method because it can reduce the persistence of the bacteria. It can save about 51% of irrigation water and can 19% higher fruit yield as compared with surface irrigation method.
- An agricultural water management system for areas that have limited soil water availability with technologies involving automation, control, and information and Communication Technologies (ICT), thus creating precision system
- Technology Readiness Level 5 (Technology validated in relevant environment)

Possible implementation

- In which industry can this technology be employed? Agriculture and water management sector
- Who are the target users? Farmers, local stakeholders, and local government.
- What sort of partnership are you seeking? Research collaboration and partnership for funding to improve the technology.
- How large will the market be? Agriculture is a huge contributor to Indonesia's economy. Around 29 percent of the Indonesian workforce works in the agriculture, fisheries and livestock sector, which contributes nearly 13 percent to the country's GDP. It is the third-biggest contributor to the economy after manufacturing and trade, according to Statistics Indonesia (BPS) data. With the rapid development of the rural economy and the continuous improvement of people's living standards, domestic greenhouses and corresponding supporting irrigation and cultivation technologies have developed rapidly. Smart water-drip irrigation fertilization technology is a modern agricultural technology that combines fertilization and irrigation technology. This technology has the advantages of water-saving, fertilizer saving, labor-saving, reducing pests and diseases, increasing crop yield, protecting the ecological environment, etc.