**Research Based Approaches**

**Introduction:**

The agriculture industry faces tremendous pressure to increase crop production and yields to meet future consumer demand for food. This problem is compounded by the population growth of the planet, severely limited natural resources (arable land and water), unpredictable weather patterns, the requirement of sustainability, and climate change, among other variables. In an effort to make farms more productive, farmers are increasingly turning to environmental measurement and data analysis. Computing systems can automate this process to facilitate faster problem diagnosis, more accurate outcome prediction, and proactive decision making.

**Research Based Cloud computing Solutions:**

**Integrating Wireless Sensor Networks with Cloud Computing**

Cloud Computing offers large benefits to the WSNs and thus provides opportunities to the researchers all over the world to perform data analysis. In this paper, an innovative infrastructure is proposed to integrate the Cloud Computing model with WSN.

A vast variety of sensors which has been connected to the global network has started another information revolution and has brought zeal in our ability to create, store and mine digital gathered information from the sensors.

Cloud Computing is principally designed and promoted so as to be data centric and an efficient source of interaction with the outside world which is an area where improved solutions are being sought. There is a possible linkage between WSN and Cloud Computing and the eventual shift of data into the cloud and over time into the public domain. In this paper an integration framework is proposed between WSN and Cloud Computing. The objective of the integration framework is to facilitate the shift of data from WSN to the Cloud Computing environment so that the scientifically and economically valuable data may be fully utilized.

The figure shows the WSN and Cloud Computing integration framework as proposed in the paper. The framework components include: Data Processing Unit (DPU), Pub/Sub Broker, Request Subscriber (RS), Identity and Access Management Unit (IAMU), and Data Repository (DR).

Data collected from the WSN moves through a gateway to the DPU. The DPU will process the data into a storage format and then send the data to the DR.

APPLICATION SCENARIOS

A. Rainforest rehabilitation underpinned by smart CSIRO technology

The CSIRO ICT Centre [12] has deployed wireless sensor nodes in the Mt Springbrook rainforest to measure growing conditions. 185 solar powered nodes were deployed with a total of 640 sensors attached to the nodes. The sensors monitor air temperature, rainfall, soil moisture, wind speed and direction, carbon dioxide concentration, sunshine, cloud cover and fog density. The data collected is growing over time and whilst this data will eventually be no longer of immediate use to CSIRO the future use of this rainforest data at a time of global warming may be considerable and making this data available through the Cloud for a fee would offset the storage and presentation costs.

**References:**

<http://www.researchgate.net/profile/Mark_Gregory3/publication/220963345_Integrating_Wireless_Sensor_Networks_with_Cloud_Computing/links/0deec516e28c6669d5000000.pdf>