

## **Application of Smart Technologies to Develop Wet Zone Paddy Farming**

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Matara, Galle, Colombo, and Gampaha districts cover most of the wet zone paddy lands in Sri Lanka. Land degradation due to invasive plants, poor drainage and water logging, high production cost, low productivity, very high labor requirement for cultivation, aging farmer community, and unavailability of appropriate technical tools and equipment are the key issues associated with the paddy farming in these districts. As a result, at present, most of the paddy lands of the southern coastal belt have been abandoned and, it has significantly reduced paddy production of these districts in the last few decades. It is not only a loss of paddy production but it has created various socio economic and environmental problems.

For solving the lowland drainage problem, the Department of Irrigation is spending hundreds of millions of rupees annually and, no adequate return can be seen. Thirteen mega-scale pump houses have been established in Galle and Matara districts, mainly focusing on the paddy farming. However, the cultivated land is much less than the extent of abandoned lands. Also, invasive plants are spreading rapidly. It leads to a high cost of land preparation and less productivity.

Most of the other problems are interconnected to each other. In most of the seasonal farming scheduling meeting (Kanna Meeting) the number of farmers participating are less than the number of officers. Various efforts such as providing financial support have been taken to encourage the farmers. However, those efforts do not show a significant improvement in the extent of land cultivated. Water management is also a huge challenge because small land pockets scattered in a large area are being cultivated. It appears that most of the available tools for farming are also not suitable particularly for the wet zone paddy lands.

It has been observed that it is a challenge to introduce new technological approaches to the farmer community in the upper age levels because they are reluctant to adopt new technologies. On the other hand, present farming approaches do not attract younger generation. It creates many vacuums in various aspects of current agriculture sector though agriculture superseded all other sectors in ancient Sri Lanka.

The approach of the management of these issues is the integration of all the sectors and their functions. There are many organizations who are looking at these issues through their own scope of specialty. Most of these organizations are doing their research and development work on their own rather than connecting with the rest of the system. The solution to overcome these problems is to develop a common platform to integrate all the efforts in a coordinated environment.

Deploying Geographic Information System (GIS) based applications has a high potential to integrate solutions to most of the issues in the system. As the first step, all the spatial data should be brought into single spatial database and publish as a web-based resource. Southern Province Irrigation Department has already taken a big step in publishing their spatial database under their domain. It will allow potential users to look at the resources in a broader view.

The next step is to introduce different technological advancements to the farming activities which can draw the younger generation to the paddy field. The path to the deployment of smart technologies would definitely be barricaded with various limitations that should be overcome.

Some of the concepts which we expect to implement based on the integrated GIS database already developed and a monitoring system are parachute planting, crop monitoring, invasive plant species identification, river monitoring and flood warning and irrigation system monitoring and controlling.

We are opened for collaborations from the other working groups or institutes working towards uplifting the agriculture in the country.

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