

GIS & RS tool for decision making in the Sugar Industry

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ABSTRACT

GIS & RS Decision Making Tool for the Fiji Sugar Cane Industry: Objective: GIS (geographical Information System) & RS (Remote Sensing) A Decision Making Tool for the Sugar Industry. Results: GIS was first introduced in the Sugar Industry in 2008, with the assistance and financial support from the Australian government (AICR). This GIS is based on digitalized maps shared with FLIS & NLTB and the extensive data base built up by FSC over the year. Data can be disaggregated all the way down to the individual farms and growers. Each farm is geo-referenced using the data available in Fiji. The industry then searched for ways that can provide a number of web-map based 'real-time' tools to facilitate decision making for the users. With assistance from the Walloon government of Belgium, saw the development of an online portal where spatial layers are mapped and queried accordingly to accommodate critical decisions. Listed below are 3 main areas that were looked into to enable the portal to have relevant baseline data 1. Cleansing the existing databases Before the portal was designed, the team looked into existing and available data within the Industry. 2 main databases (Sugar 3 and 4) were used to derive farmers profile and attributes to his farms. This existing data together with data from FLIS were consolidated into 1. For the industry it was crucial to ensure that farmers are supplied with the right type of seedlings, fertilizers, and sugar cane variety. Using GIS application, we were able to view all data as 1 layer. Below is a captured scene from the portal. On the left is the full scale image and on the right is the zoom plot with information regarding the plot as discussed above. 2. Harvesting and Transport Plan Transporting cane from the field to the mill is an expensive process. Both capital and operating costs are large. Cane transport is the largest cost unit in the manufacturing of raw sugar accounting for about one third of the total manufacturing costs. Studies conducted by Jonathan Bower of the Secretariat of the Pacific Community, concluded the need to conduct a cost and benefit analysis on the degree to which rail expansion would affect transport costs in the Industry. He also highlighted that maximum charges per tonne on road transport should be updated yearly based on inflation and the cost of fuel. GIS application uses this raw data and mapped and categorized areas according to their transportation mode. After separating the 2 modes of transport, and using statistics from previous years, queries were developed to identify areas of high and low cost transportation. Using the portal to illustrate such distinctive feature, an extra tool developed into the portal was the measurement tool, to which estimation of growers location can be derived from the nearest mill. 3. Forecast Having all data merged into one we can then forecast how much tonnes of cane is generated by each farm, then by each sector, further to each mill then the total production of sugar for the year. The forecast of sugar content can then be used to assist marketing decision for the sale of sugar. Below is captured scene from Drasa sector where an overview of cane production can be

easily viewed as harvested plots. The Sugarcane Industry does not stop here. We are also looking into creating sugar GIS models and implementing it as a monitoring tool for damage assessment in the event of natural disaster occurring in the sugarcane belt area. In addition to this, the team is currently researching ways in which developed countries are using this tool to maximize profit and find ways on whether the same process can be implemented in locally.

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