

Data Collection in Protected Agriculture for Subsequent Big Data Analysis: Methodological Evaluation in Venezuela

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Abstract : During the last decade, data analysis, strategic decision making, and the use of artificial intelligence (AI) tools in Latin American agriculture have been a challenge. In some countries, the availability, quality, and reliability of historical data, in addition to the current data recording methodology in the field, makes it difficult to use information systems, complete data analysis, and their support for making the right strategic decisions. This is something essential in Agriculture 4.0. where the increase in the global demand for fresh agricultural products of tropical origin, during all the seasons of the year requires a change in the production model and greater agility in the responses to the consumer market demands of quality, quantity, traceability, and sustainability -that means extensive data-. Having quality information available and updated in real-time on what, how much, how, when, where, at what cost, and the compliance with production quality standards represents the greatest challenge for sustainable and profitable agriculture in the region. The objective of this work is to present a methodological proposal for the collection of georeferenced data from the protected agriculture sector, specifically in production units (UP) with tall structures (Greenhouses), initially for Venezuela, taking the state of Mérida as the geographical framework, and horticultural products as target crops. The document presents some background information and explains the methodology and tools used in the 3 phases of the work: diagnosis, data collection, and analysis. As a result, an evaluation of the process is carried out, relevant data and dashboards are displayed, and the first satellite maps integrated with layers of information in a geographic information system are presented. Finally, some improvement proposals and tentatively recommended applications are added to the process, understanding that their objective is to provide better qualified and traceable georeferenced data for subsequent analysis of the information and more agile and accurate strategic decision making. One of the main points of this study is the lack of quality data treatment in the Latin America area and especially in the Caribbean basin, being one of the most important points how to manage the lack of complete official data. The methodology has been tested with horticultural products, but it can be extended to other tropical crops.

Keywords : greenhouses, protected agriculture, data analysis, geographic information systems, Venezuela

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