GEOFERT: DIGITAL SYSTEM FOR MONITORING THE APPLICATION OF PIG SLURRY AS FERTILIZER

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In regions where intensive animal production is concentrated, one of the great challenges is the correct management of waste. Pig production is the one that presents the greatest difficulties, given the high organic load present and the fact that the manure is handled predominantly in liquid form. Due to these characteristics, pig farming is considered by legislation as a potentially polluting activity. To obtain the environmental license, the pig farmer must meet a series of requirements related to the location of the facilities, structures for storing the pig slurry. When the pig slurry is used as an organic fertilizer, it must respect a balance that demonstrates the balance between the supply of nutrients and the nutrient demand of the areas to be fertilized. If the pig farmer does not have enough agricultural area to meet this balance, he has two options: 1) reduce the size of his herd according to the available area capacity; 2) sign “assignment contracts”, third-party areas in conditions to take advantage of them. In regions where small properties predominate, as is the case in the West of Santa Catarina, the most frequent situation of pig farms is that of dependence on areas for concession. This condition demands a large movement of vehicles, usually tractors coupled with a tank with a capacity of 4 m3, to carry out the service. However, this movement has been carried out without an adequate monitoring process, limiting the necessary verification with environmental agencies. Aiming to facilitate this monitoring, as well as to improve the municipal fleet management process, it was developed within the scope of the project “ Development of an environmental management model for areas with intensive animal production in the South of Brazil ”, funded by Embrapa Research Macroprograms, the prototype of a digital waste management system called “ Geofert ”. The first version of Geofert was tested within the fleet of machines of the Municipal Department of Agriculture and Environment (SMAMA) in the municipality of Presidente Castello Branco, SC. The system consists of a combination of a geopositioning device (GPS) in the vehicles that transport waste to a Geographic Information System (GIS), built from data from the Rural Environmental Registry (CAR). Initially, the construction of the prototype used the Arduino platform to obtain the geographic positioning data of the vehicles. Later, an Android application was integrated into the prototype, allowing the geographic coordinates to be obtained by smartphone. This evolution also made it possible to include functionalities such as scheduling services and issuing management reports through a web interface. The prototype met the objectives perfectly, as it allowed identifying the route, time and place of application of the biofertilizers, as well as generating reports with the necessary information for “ legal proof”. In addition, the data generated by the Geofert system can be linked to other databases, generating information of interest to users, such as operational control of fleets and streamlining service scheduling.