

MAPPING OF INDUSTRY FOOD PROCESSING SUPERIOR BASED ON GEOGRAPHIC INFORMATION SYSTEM

Teddy Oswari¹, Fenni Agustina², Emy Haryatmi³ and
E. Susy Suhendra⁴

Abstract: *The emphasis of agricultural industry in Indonesia is located in program of increased food security, agribusiness development and improving the welfare of farmers. Priority Food security in formation of farmers independence in maintaining of local resources efficiently and optimally, so that these resources can be exploited further. The research objective is to map of industry food processing superior, featured local resource determination, establishment of documentation and making the application of Geographic Information System (GIS) to support improved food processing industry superior in self-sufficiency and food security, growth and development of the food industry in the country.*

Research implementation method with data collecting of industry food processing superior in Central Java Province by creating a database and taxonomy, mapping food processing industry in the district/city and making digital portal which include feature data base of industry food processing components in order to introduce industry food processing superior to the general public.

The results achieved are documenting of industry food processing superior and the establishment of GIS to all districts /cities of Central Java Province, in order to encourage increased industry food processing, industrial real incomes, the processing quality and increase the independence of the food processing industry.

Keywords: *mapping, industrial, processing, food, superior*

1. INTRODUCTION

Local excellent programs in Indonesia cannot be separated entirely from commodity strategic bases. It is stated in the formulation of agricultural development that indicative targets production of major commodity crops and superior until 2006. However, the decrease in cultivated area per farmer and limited irrigation water supply and high prices of inputs, and the relatively low price of the product can be limiting factors and constraints for program improvement independence and prosperity of farmers that are based on local resources (Ministry of Agriculture Food Security Agency of the Republic of Indonesia, 2012).

^{1,4} Faculty of Economic, Universitas Gunadarma, Jakarta

^{2,3} Faculty of Industrial Technology, Universitas Gunadarma, Jakarta

¹toswari, ²fenni, ³emy_h, ⁴susys[[@staff.gunadarma.ac.id](mailto:staff.gunadarma.ac.id)]
toswari@staff.gunadarma.ac.id

Efforts towards improving the welfare of farmers may be carried out through empowerment counseling, mentoring, business assurance, price protection, protection and promotion policies. Some of these efforts are relatively very necessary, but a limiting factor as mentioned earlier should get careful attention to the local level.

Grand strategy that has been established by the Ministry of Agriculture in the development of agribusiness, which essentially covers four important things, namely: (1) The development of agriculture must be at the core of national development. (2) The development of agriculture must be made through a system of agribusiness. (3) The success of the agribusiness development largely depends on factors and policies which are outside the lines of authority Department of Agriculture so that the necessary effort excellent coordination among related institutions. (4) Development of agribusiness should be able to improve competitiveness, building a democratic economy, sustainable and decentralized within the framework of the strengthening of the regional economy, so the development of agribusiness done through patterns of development potential and community of economic capacity.

According to Teddy *et al.*, 2013, the geographic information system is needed in order to adjust the balance of the production of horticultural crops in West Java and useful to get accurate information on the composition of vegetable supply needs for commodities tomatoes, potatoes and red pepper in a region Bandung regency. Research and application of Geographic Information Systems in the local main commodity in Indonesia at this time should be a database of all the leading commodity for farmers and businessmen in order to improve competitiveness and export sales value to many countries.

In fact the food security program cannot be separated from the development of food security that is directed to meet the food needs of the community, nutritious, safe, quality according to taste and belief, through improved productivity, quality, and efficiency of food production plant origin livestock and fish sustainably; processing and diversification of food.

Priority issues of food security is the formation of farmers independence in maintaining of local resources efficiently and optimally, so that these resources can be exploited further. This can be achieved with the help of information and communication technologies with the creation of GIS (Geographic Information System) to support the form and the consistency of food security in Indonesia in general (Teddy *et al.*, 2013).

Efforts to go on improving the welfare of farmers may be carried out through empowerment counseling, mentoring, business assurance, grain price protection, protection and promotion policies. Some of these efforts are relatively very necessary, but a limiting factor as mentioned earlier should get careful attention

to the local level. This is understandable given that most farmers in Indonesia for food commodities is still classified as subsistence farmers in a sense as producers as well as consumers.

Based on these two factors are urged to do is to document and map the agricultural products which are local products featured. This documentation requires the utilization of various physical potential, economic, environment and social culture. One of the potential that can be used for documentation and mapping of agricultural products in Indonesia is the utilization of information technology and communication. Utilization of information technology and computer in preservation of national culture by developing documentation of local resources in agriculture, which will support the food security program with the latest available data with a high degree of complexity, as well as having the ability of accessibility and relevancy of reliable information.

The purpose of this research is to map the industry in determining local resources are the mainstay using nets Geographic Information System (GIS) to support (1) to design the increasing agricultural production through making of prototype GIS for mapping the products featured local food crops.

Priority issues of food security is the formation of farmers independence in maintaining of local resources efficiently and optimally, so that these resources can be exploited further. The utilization of these resources is done by processing food products, so it can produce a wide range of food production and food processing business grow both households, SMEs and private. This can be achieved with the help of information and communication technologies with the creation of GIS (Geographic Information System) to support the form and the consistency of food security in Indonesia. One of example food processing industry in West Java in Garut district in the village of Cilawu. Cilawu village is one place that processes corn into crackers and popcorn and processing of cassava into chips.

2. RESEARCH METHODS

This research was conducted by using qualitative methods with the steps of data collection in food processing industry, Central Java Province as the research sample. Source of data derived from BKPM RI Office Centre and the Department of Cooperatives and SMEs in Central Java. Data obtained Year 2011-2014 in the form of line of business/industrial processing, industrial location, the value of investment, production capacity. Furthermore, making of the database and the processing industry taxonomy and mapping in each district/ city and manufacture digital portal which will include various data base features of industry food processing featured with geographic information systems.

Operationalization of analysis system variables at data collection survey and structural analysis in order to gain an understanding of the problems, efficiency

and considerations leading to system development. Analyzing structured is to analyze the input materials which have been obtained from the survey results with systems analysis and procedures, information systems analysis, and supporting facilities analysis. The conceptual system design from the research result and analysis which conducted based on the conceptual design, model or sub-systems that have been defined.

Using of this research findings is a database generated about edible plants and taxonomy is expected to know the specificity of the food processing industry in the district, thereby reducing reliance on other industrial sites, databases regarding food processing industry is expected to be a reference to the existence of at least one district/city, the food processing industry virtual portal is expected to meet the needs of each district to find out typical of the industry of the district, GIS maps in the food processing industry virtual portal is expected to be a reference and it is expected to help investors to obtain information about the progress of food processing industries.

3. RESULTS AND DISCUSSION

According to Z. Duran in 2003, Steps of the design of a prototype web digitizing food processing local featured -based Geographic Information System (GIS) is (1) Installation tool supporting Map Server, IDE / Text Editor using note pat ++ or another tool, MySQL database and Install Applications Quantum GIS. (2) Determination of the area of observation and research that is the island of Java. (3) Determination of spatial data and non-spatial in certain regions in Central Java. (4) Perform tracking spatial data. (5) Making the database. (6) Making the web and connection.

Prahasta, E., 2005, stated that Database design and taxonomy done with Hybrid Data Model. The first step understands the presumed mechanism for optimal data storage location information (spatial data or co-ordinates) on the one hand, it will cause not optimal for storage of non-spatial information on the other side. Thus, the data cartographic (the coordinates) digital stored in a file with a set of operating system direct access to increase the process speed input-output, meanwhile, the data attributes will be stored in a standard relational DBMS format. Thus the GIS software will serve as the manager of the relationship between the spatial data and table attribute are formatted DBMS during processing of operations or map data analysis.

While the mechanism that is used to auto-merge spatial data (layer) with Tave-table attributes remain the same, namely to define the identification number (ID) as a key attribute that is unique to the element of spatial and then place it too in table attribute to enable it to remain intertwined in an effort to establish the information intact.

Integrated data model approach can be described as an approach to spatial database management system, GIS acting as the query processor. Most implementations is the form of vector topology with rational tables that store the coordinate data-coordinates of the map elements (points, nodes, line segments, etc.) along with other tables containing data topology.

With integrated GIS data model (spatial-attribute), there are a number of characteristics that are specific to spatial data as the implications of its use. Viewpoint of database is possible to store coordinates data and topology data required to classify elements of digital cartographic by using a design that is based on normal form Boyce Codd (Budiyanto, E., 2002).

Prahasta, E. 2007 describes the story-board Web GIS has been designed, starting with the identification of needs such as web prototype on display 1 there is an explanation grant program in the making of this website and the slide show pictures of agriculture and industry food processing featured. Display 2 provides information about the content of the web and the leading commodity chart, each production area. Display 3 specifically describe the content of web GIS. Display 4 displays the e-book about variety of local commodities featured that also come with the product information and images. Display 5 provides map products that have featured local area. Display 6 provides information about the team research and Display 7 contains tables completeness of web content.

Display of Design Interface Website Geographic Information System.

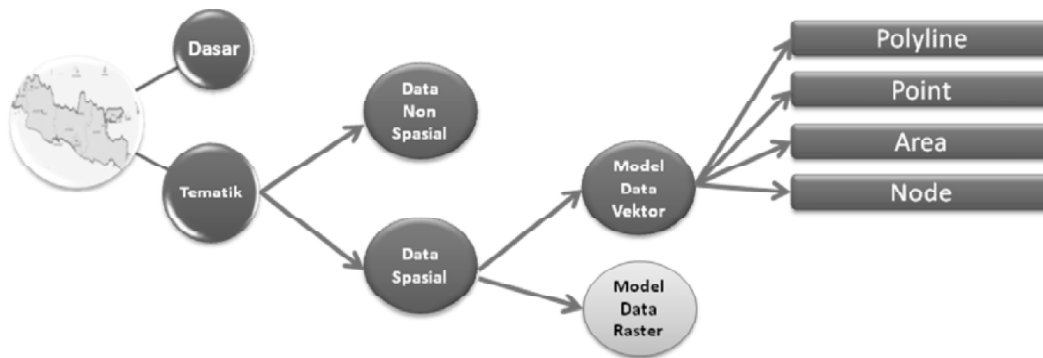


Figure 1: Design Geographic Information Systems

Mao, J, R. *et al.*, 2008, stated the prototype web Geographical Information Systems distribution of food and beverage industry in the region, it is used for users who want to see the results of food and beverage industry distribution. In Indonesia, the distribution of food and beverage industry in every province and

district can be identified properly. The prototype that has been made is the one of prototype in Java provinces.

The first web page display, after a user has logged into hosting: www.riset-industri pangan.com, it will display the web, as shown in Figure 2. The user can see the *pinpoint* that indicates the name of the Provincial and District name/city. On the web, there are two tables, namely Tables of Industry Select to sort Table Select City for Sort.



Figure 2: Initial Web Display

Second display at Figure 3, if we highlight Table Select Industry to Sort, then it will provide information that contains a selection of 22 types of food and beverage industry are produced.



Figure 3: Display Information Select Industry to Sort

The third display in Figure 4, if we highlight Table Select City to Sort which contains a selection of 25 names of the district /city.

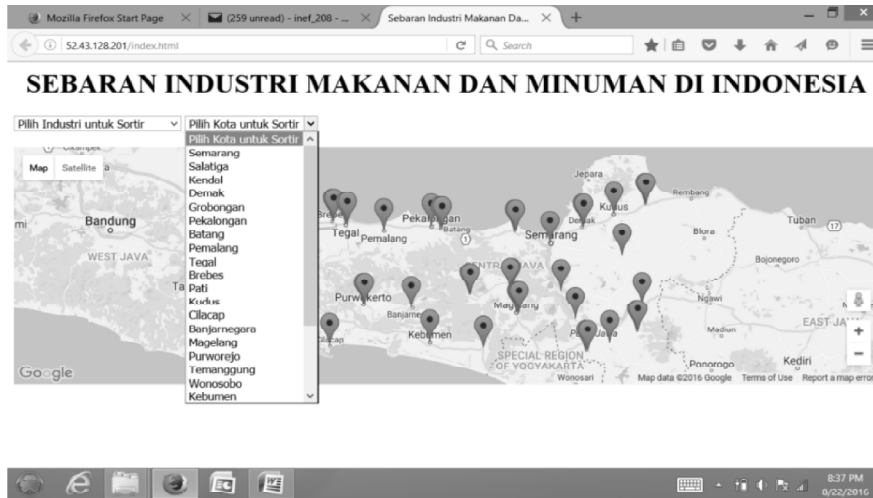


Figure 4: Display Information Select City Sort

Fourth display in Figure 5, if we highlight one type of industry and city, so it will display the *pinpoint* which provides information on the name of the district concerned with the type of production, production number and year of production. And below the web image will appear a table containing information about the types of food and beverage production generated by the district and its production capacity and year of production.



Figure 5: Display Information Select Industry and the City

Fifth display in Figure 6, if we select a highlight one of the districts/city, so it will display the *pinpoint* which provides information on the name of the district/city concerned with the type of production, production capacity, year of production and investment value. And below the web image will appear a table containing the complete information about production of food and beverages produced by the district/city.

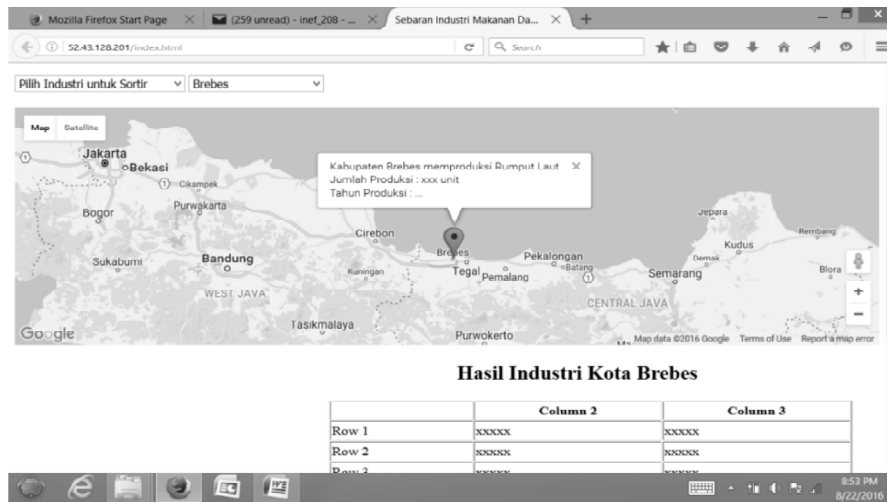


Figure 6: Display Information Select City

Sixth display in Figure 7, if we highlight one pinpoint, without choosing a table Select Industry to sort and select city to Sort, then it will appear that gives

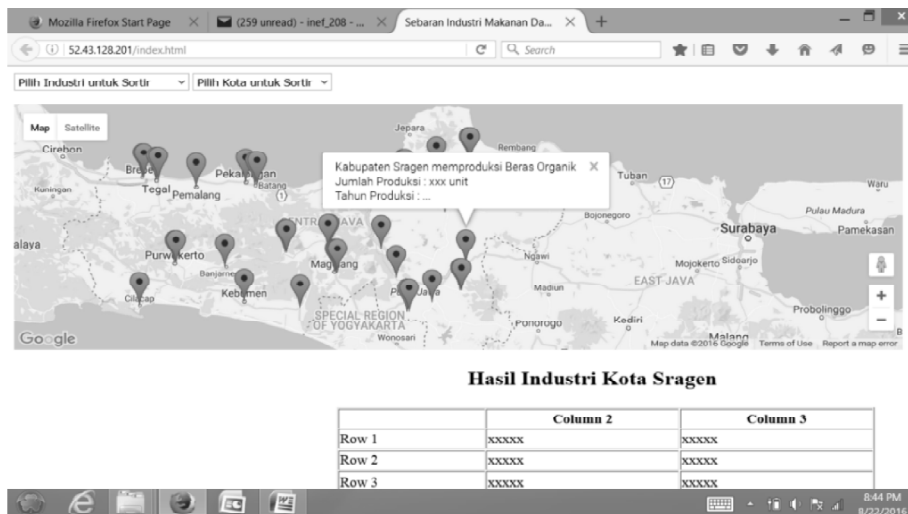


Figure 7: Display Information Select One Pinpoint

information about the name of the district concerned with the type of production, production capacity, year of production and the value of investments. And below the web image will appear a table containing the complete information about production of food and beverages produced by the district/city.

Overall the web design stage featured food processing industry has been created by doing three times of the design improvement. The draft is expected to be a reference initial search of food processing industry presence information featured in all regions in Indonesia. Researchers working on the completeness of data and information continuously about the existence of seed industry in each region in Indonesia.

4. CONCLUSION

Featured food processing industry continues to be improved by the government, especially around areas that have and be able to explore its superior commodities. Simultaneously improving farmers' welfare policies are needed long-term and short-term policies are needed the protection of farmers with import restrictions but should be supported by policies that encourage increased domestic production through improving the productivity of the food processing industry seeded as in Java, Sumatra, Kalimantan, Sulawesi and Papua ,

This research designed a prototype geographic information system in order to perform more accurate mapping to find a local industry food processing featured in Indonesia. Steps being taken are to document and map of the processing industry results which is featured local products. This documentation requires the utilization of various physical potential, economic, environment, and social cultural that is owned by the utilization of information technologies and communication that have the ability of accessibility and relevancy of reliable information.

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