HOTSPOT ANALYSIS ON POVERTY, UNEMPLOYMENT, AND FOOD SECURITY IN JAVA, INDONESIA

DIAN KUSUMANINGRUM

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DECLARATION OF THESIS AND SOURCES OF INFORMATION

I hereby declare that the thesis Hotspot Analysis on Poverty, Unemployment, and Food Security in Java, Indonesia is my own work with guidance of my supervisors and has not been proposed to any other Universities in any form. Sources of information derived or quoted from a published or not published work conducted by other authors are mentioned in the text and included in the Reference at the end of this thesis.

Bogor, February 2010

Dian Kusumaningrum
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ABSTRACT

DIAN KUSUMANINGRUM. Hotspot Analysis on Poverty, Unemployment, and Food Security in Java, Indonesia. Supervised by ASEF SAEFUDDIN and MUHAMMAD NUR AIDI

Eradicating extreme poverty and developing strategies for decent and productive work for youth is a very important issue in Indonesia. Hence, it would be important to conduct a research to evaluate the circumstances of these issues in Indonesia. Geoinformatics techniques can be explored further to obtain premises for decision making and finding methods for better strategic efforts. Satscan is a geoinformatics tool widely used in hotspots detection. In this research the hotspots obtained by Satscan was compared with the hotspots obtained from ULS and the official food scarcity and poverty map developed by the Food Security Agency. The hotspot related to poverty, food scarcity and poverty were mainly in Central Java, East Java, and Yogyakarta. Afterwards, main factors causing the hotspot were analyzed by Ordinal Logistic Regression Model. Factors related to the hotspot were school facilities, village trade, village industry, village services, slum areas, proportion of families without electricity, and credit facilities.

Keywords: Food scarcity, poverty, unemployment, hotspot detection, ordinal logistic regression
SUMMARY

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Eradicating extreme poverty and developing strategies for decent and productive work for youth is a very important issue in Indonesia. Hence, it would be important to conduct a research to evaluate the circumstances of these issues in Indonesia. Geoinformatics techniques can be explored further to obtain premises for decision making and finding methods for better strategic efforts. Satscan is a geoinformatics tool widely used in hotspots detection. In this research the hotspots obtained by Satscan was compared with the hotspots obtained from Upper Level Set (ULS) Scan Statistic and the official food scarcity and poverty map developed by the Food Security Agency.

Another problem faced by Satscan and ULS is the stability of the hotspot clusters obtained. Changing the maximum cluster size will lead to different hotspots. The default maximum-size setting of 50% seldom produces usable, informative results because the reported primary cluster often occupies a large proportion of the study area. Therefore, it is difficult to determine an optimal setting for scaling parameters. Thus a process for addressing the sensitivity issues of scan statistics method and enhancing the interpretation of scan statistics result was conducted (Chen et. al 2008). First, scan statistics methods were run multiple times, starting from a small maximum-size (5%) and systematically increased to the 50% default value. Second, the results were visualized in a map matrix for side-by-side comparison of different maximum-sizes. Third, the reliability of a region in a map was calculated and interpreted. Fourth, core clusters would be discriminated from heterogeneous clusters through interpretation of the reliability. Fifth, the interpretation of core clusters has been confirmed by comparing the results to other independent techniques and
consultation with domain experts. In this study for poverty and food scarcity, the results of Satscan and ULS were compared with the Food Security Map and Poverty Map accomplished by CBS and FSA.

Based on the comparison of ULS and Satscan on the poverty and food scarcity case in 78 districts in Java, ULS showed more accurate and stable results. The stability can be seen from the average stability score of clusters. For poverty and food scarcity ULS had an average stability score above Satscan. Meanwhile accuracy can be seen from the precision of ULS and Satscan in detecting high percentages of poor and food scarcity cases. These areas are known as first priority areas in Food Security Agency and CBS. The percentages of accuracy of ULS in detecting high cases of poverty and food scarcity are higher than Satscan. Therefore ULS was used to detect hotspots of poverty, unemployment, and food scarcity in all areas of Java.

The hotspot related to poverty, food scarcity and poverty were mainly in Central Java, East Java, and Yogyakarta. Areas such as Cilacap, Demak, Kab.Madiun, Kota Pekalongan, Kulon Progo, Pemalang, and Purworejo were identified as critical areas because these areas were poverty, unemployment, and food scarcity hotspots. Based on the stability analysis Cilacap was the core cluster of poverty, unemployment, and food scarcity. This indicated by using several maximum cluster sizes Artinya Cilacap was identified as a poverty, unemployment, and food scarcity hotspot. Hence, Cilacap should be given prioritization. Meanwhile Kota Batu, Salatiga City, and Serang City were not detected as critical areas.

Main factors that caused the hotspot were analyzed by Ordinal Logistic Regression Model. Factors related to the hotspot were school facilities, village trade, village industry, village services, slum areas, proportion of families without electricity, and credit facilities. The increase of school facilities, stimulating
economical potential of a village in industry and services, decreased the possibility of an area to become critical areas. The government should give more attention to credit facilities, economical potential of a village in trade, villages without electricity, and small scale farm industry. It turned out that the increase of these factors increased the possibility of a municipality to become a critical area. From this study it was pointed out that credit facilities, farm Industry and trade in a village did not show indication that it could improve the welfare of people living in critical areas. Hence, these factors should be revitalized. Areas that had a high ratio of families living without electricity were also critical points in solving the problem of poverty, unemployment, and food scarcity. Therefore the government should have given more attention to people who lived in these areas.

Keywords: Food scarcity, poverty, unemployment, hotspot detection, ordinal logistic regression
RINGKASAN

DIAN KUSUMANINGRUM. Hotspot Analysis on Poverty, Unemployment, and Food Security in Java, Indonesia. Dibimbing oleh ASEP SAEFUDDIN dan MUHAMMAD NUR AIDI


Permasalahan lain dalam Satscan dan ULS adalah kestabilan dari gerombol hotspot yang diperoleh dari kedua metode tersebut. Perubahan nilai ukuran gerombol maksimum (maximum cluster size) menyebabkan perubahan gerombol hotspot yang diperoleh. Ukuran gerombol maksimum 50% (default) menghasilkan gerombol hotspot yang kurang informatif karena gerombol hotspot utama yang diperoleh sering kali menempati sebagian besar daerah studi. Sehingga seringkali sangatlah sulit untuk menentukan ukuran gerombol maksimum yang optimal. Sebuah proses untuk menangani isu-isu sensitivitas metode scan statistik dan meningkatkan interpretasi hasil scan statistik telah diusulkan (Chen et. all 2008). Pertama, metode scan statistik harus disimulasikan berulang kali, dimulai dari ukuran maksimum yang kecil dan meningkat menjadi


kerawanan pangan oleh karean itu daerah Cilacap harus diutamakan. Sedangkan Kota Batu, Kota Salatiga, dan Kota Serang merupakan daerah yang tidak kritis.


Kata Kunci: Kerawanan pangan, kemiskinan, pengangguran, pendeteksian hotspot, regresi logistik ordinal
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ABOUT THE AUTHOR

The author was born on June 4th, 1981 as the first child of two children of Hermanto and Karyani. The author has graduated from SD Polisi IV Bogor in 1993, afterwards graduated from SMP Negeri IV Bogor in 1996, and graduated from SMU Negeri IV Semarang in 1999. After having the opportunity to have a brief education in Diponegoro University Semarang, the author enrolled in Statistics Department Bogor Agricultural University in 2000 through a National Selection Test to Enter State Universities (UMPTN) and took social economics as her minor. In 2007 she had the opportunity to continue her studies in Statistics at Post Graduate School of Bogor Agricultural University and married to Tosan Wiar Ramdhani in the same year. The author started to be involved with social studies related research in 2005 when she had the opportunity to become a research assistant in UNESCAP-CAPSA and since 2006 the author has been working as a Staff Lecturer at Department of Statistics Bogor Agricultural University.
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