A Spatial Analysis on International Remittances, Food Consumption and Deprivation in Indonesia

Maria Elfani *London Metropolitan University, United Kingdom*

Abstract

This paper aims to illustrate how international remittances may relate to food consumption and deprivation in Indonesia. The idea is that international remittances may contribute to the reduction of poverty, and since food consumption is an element with which to measure poverty line, this paper intends to show whether international remittances are more likely to be received by poorer households–based on food consumption level in the households. Using Geographic Information Systems (GIS) and the data from the Indonesia Family Life Survey (IFLS4), this paper illustrates the mapping of international remittances and food consumption in some of Indonesia's provinces. The spatial analysis shows correlation between international remittances and food consumption. International remittances tend to be received by households who have less spending on food. The geographical pattern shows that international remittances are more likely to be received by poorer households based on their food consumption. The result to some extent supports the view that international remittances might benefit the poor the most, particularly on tackling poverty, as poorer households are more likely to receive the remittances.

Keywords: Remittances, Indonesia, Deprivation, Food Consumption

Introduction

International migration has played an important role on influencing the economic condition of the home countries: countriesof origin where migrants are coming from. The World Bank estimates that 3.2 percent of the world population, orapproximately 215.8 million people, lived outside their country of birth in the year 2010 (Ratha *et al*., 2011). Of the countries with the highest emigration, based on the number of emigrants in 2010, Indonesia was nineteenth; it is estimated that 2.5 million Indonesians emigrated in that year (Ratha *et al*., 2011). One of the economic benefits of international migration is to produce international remittances to the home countries where the remittances are seen as one of the tools to reduce the level of poverty of the home countries. Indonesia received approximately US$ 6.9 billion in remittances from all over the world in 2010; it ranked seventeenth of top remittance-receiving countries in that year (World Bank, 2011; Ratha *et al*., 2011). International remittances are found to reduce the poverty level in developing countries (Adams and Cuecuecha, 2010). International remittances also play significant roles in reducing poverty in Indonesia.

This paper is concerned with understanding the role of international remittances in relation to deprivation using Geographic Information Systems as the methodology. In Particular, it aims to look (at province level) at any geographical (spatial) relationship between food consumption level

Journal of ASEAN Studies, Vol. 3, No. 1 (2015), pp. 42-52
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ISSN 2338-1361 print / ISSN 2338-1353 electronic

in the households and the receiving of international remittances in the households. The hypothesis is that those households that receive remittances tend to be poorer by looking at their food consumption spending; and likewise households who do not receive remittances are thus considered as better off. If the spatial analysis could confirm this hypothesis, it would support the view that international remittances benefit poorer households, since they are the ones that receive and thus enjoy the advantage of remittances (i.e. by consuming or spending more on household expenditure).

International Migration and Deprivation

The push-and-pull theory of international migration suggests that people migrate because they are pulled towards the economic benefits of migration, for example the higher wages and better jobs in the host country (country of destination). On the other hand, people are pushed to migrate because of the economic disadvantage they experience in their home country, for instancedue to deprivation or poverty conditionsin the household. Stark and Taylor (1989) show that international migration brings an income gain especially to the deprived household. They surveyed two villages in Mexico consisting of 61 randomly-selected rural households and found that the initial relative deprivation wasa significant pull factor for people to migrate to the United States. In other words, if the members of a household feel that theirs does not have enough commodities in comparison to other households in their neighbourhood, that is the relatively deprived condition, the probability that those members will migrate is higher. Thus, the more deprived the household condition, the more incentive for the household members to migrate. Better-off households, on the other hand, have less incentive to migrate.

International migration may, to some extent, produce international remittances which may directly or indirectly contribute to the spendingbehaviour of the household. The assumption isthat if members ofdeprived households are more likely to migrate, the remittances produced by international migration may also benefit the deprived households the most. International migration may therefore, to some extent, play an important role on deprivation (poverty reduction) of the home country.

International Remittances and Deprivation

International remittances are seen to have an important role in reducing the poverty of the country who receives them. International remittances might, to some extent, influence household spending on consumption and investment. Adams and Cuecuecha (2010) illustrate three views on how international remittances might be spent by the receiving households. Firstly, a household might treat an international remittance as an additional source of wage and would thus spend it as it would normally spend an additional wage. Secondly, international remittances might be consumed by the household, therefore household spending on food or consumable goods might increase. The third view suggests thatinternational remittances might beinvested on investment goods such as human investment (education) and physical-capital investment (housing) which may lead to economic development in the country (Adams and Cuecuecha, 2010: 3).

Previous studies of Adams and Page (2005) and Acosta *et al*. (2006) show how international remittances create significant impacts on the reduction of poverty in the countries that receive remittances. Adams and Page (2005) construct a new data set on international migration, remittance, inequality and poverty from 71 developing countries and found that a 10% increase in the share of international migrants in a country's

population may lead to a 2.1% reduction in the share of people living on less than $1 a day. They also suggest that a 10% increase in per-capita official remittances may lead to a 3.5% reduction in the share of people living on the poverty line. Acosta *et al*. (2006) in their study on remittances and development in Latin America, using household survey data from ten Latin American countries, suggest that, on average, a 1% increase in remittances-to-GDP ratio leads to a 0.35% to 0.40% reduction in the poverty headcount.

The economic impact of international remittances on Indonesia is extensively studied by Adams and Cuecuecha (2010). Using the Indonesian Family Life Survey, they find that international remittances reduce the poverty headcount by 29.7% and reduce the squared poverty gap by 69.9%. They also find that the household consumption on food is increased by 8.5%. This paper supports the findings that international remittances contribute to the reduction of poverty although it does not aim to investigate such a thing per se. This paper also agrees on the view that international remittances change the household behaviour on consumption, particularly on food consumption, although the spatial analysis used in this paper could not confirm such a cause and effect relationship. What this paper aims to understand is whether the international remittances are received by poorer households according to their food consumption. Such confirmationmight strengthen the previous findings of Adams and Page (2005), Acosta *et al*. (2006), Adams and Cuecuecha (2010) that international remittances significantly contribute to reduce poverty. This is particularly the case in Indonesia where Adams and Cuecuecha (2010) found that the remittances are being used to spend more on consumption goods (food), as they argue that householdswho receive remittances areconsiderably poorerthus the remittances are mainly used to spend on the very basic necessity: food.

Geographic Information Systems (GIS)

The contributions of Geographic Information Systems (GIS) to discover and share new understandings in social sciences have been acknowledged in social sciences research (Longley *et al*., 2011). GIS is a powerful tool to solve major problems affecting the governments, society, and individuals, such as the problem of poverty, population growth, disease, and crime. It could measure the characteristics of geographic phenomena, represent the measurements to highlight spatial themes and relationships, and use the representations to produce more integrated frameworks of relationships (Chrisman, 2003; Longley *et al*., 2011).

Sipe and Dale (2003) use GIS to research and control the problem of malaria in Indonesia. GIS is used to map the incidence of malaria in some geographic areas in Indonesia and correlate the incidence with the population in order to illustrate the pattern of population at risk. They also map the relationship of malaria incidence with variables such asdemography (age, gender), population movement, temperature, and rainfallto see if any relationship exists.

The application of GIS in social sciences research is presented in Hamnett's (2003) study. It uses the spatial analysis to examine inequalities in London by looking at the relationship of unemployment and deprivation. Hamnett (2003) found that the geographical pattern of unemployment is consistent with social deprivation, which is measured by: index of deprivation, index of underprivileged area, long-term illness population, and low household income distribution. He also applies the spatial analysis to describe the occupational and social characteristics of London. The analysis of gentrification (the increase in the middle class) and the distribution of professional and management occupations, for instance, are presented using the mapping format.

Coy *et al*. (2011) also demonstrate the use of the mapping technique in solving the problem in social sciences. They use the GIS to assess spatial characteristics of Violence against women (VAW), specialized support services, and the distance women travelled to access these services when fleeing domestic violence. Through the mapping technique, they found that the provision of the VAW specialized-support services is inadequate. They viewed GIS as an innovative tool to solve problems not only in the field of violence against women, but also on gender equality and social change in broader theme.

In relation to this paper, the use of GIS is expected to represent geographically the relationship between international remittances and food consumption. It is expected that the spatial analysis, through mapping would provide a better understanding, at least from the visual point of view, about how international remittances are represented in connection with food consumption and deprivation. The use of GIS is considered to be one of the innovative methodologies in the study of international remittances. It is expected that this paper will show the original contribution of using geographical / spatial analysis to visually understand the relationship of international remittances and deprivation. Despite the usefulness of GIS, however, it is still less reliable as a tool in explaining the statistical relationship between variables. One of the weaknesses of GIS, this paper argues, is that it could not demonstrate the statistical relationship between international remittances and deprivation. It could suggest the association between them, but it could not determine any cause and effect relations. It could visually show the association but it could not measure (statistically) the strength of the association (or the correlation) between variables. Therefore, there is still the limitation that the GIS result, or indeed the result of this paper, could not suggest any statistical relationship between international remittances and deprivation. What this paper does suggest, is only a spatial / geographical association.

Mapping the International Remittances and Food Consumption in Indonesia

This paper hypothesizes that international remittances tend to be received by deprived households. The basis of what constitutes a deprived household is based on food consumption per household, i.e. the less the consumption of food, the more deprived the household. The food consumption is simply chosen following the measurement of poverty line by the Statistics for Indonesia (Badan Pusat Statistik – BPS). BPS measures the poverty line using the expenditure approach by calculating food and non-food consumption. Food consumption is calculated by the amount of money spent on foodto reach the minimum calorie requirements (Maksum, 2004).

This paper therefore suggests that food consumption is an important component to measure poverty or deprivation of a household.It is one of the basic necessities that if a household or a household member spent less than the average person (or household) spent on the minimum calorie requirements, the respective household or household member can be considered as deprived or poor. Although it is also understood that food consumption is not the only component for measuring poverty, as non-food expenditure such as housing, health, and education is also taken into account on measuring the poverty line.

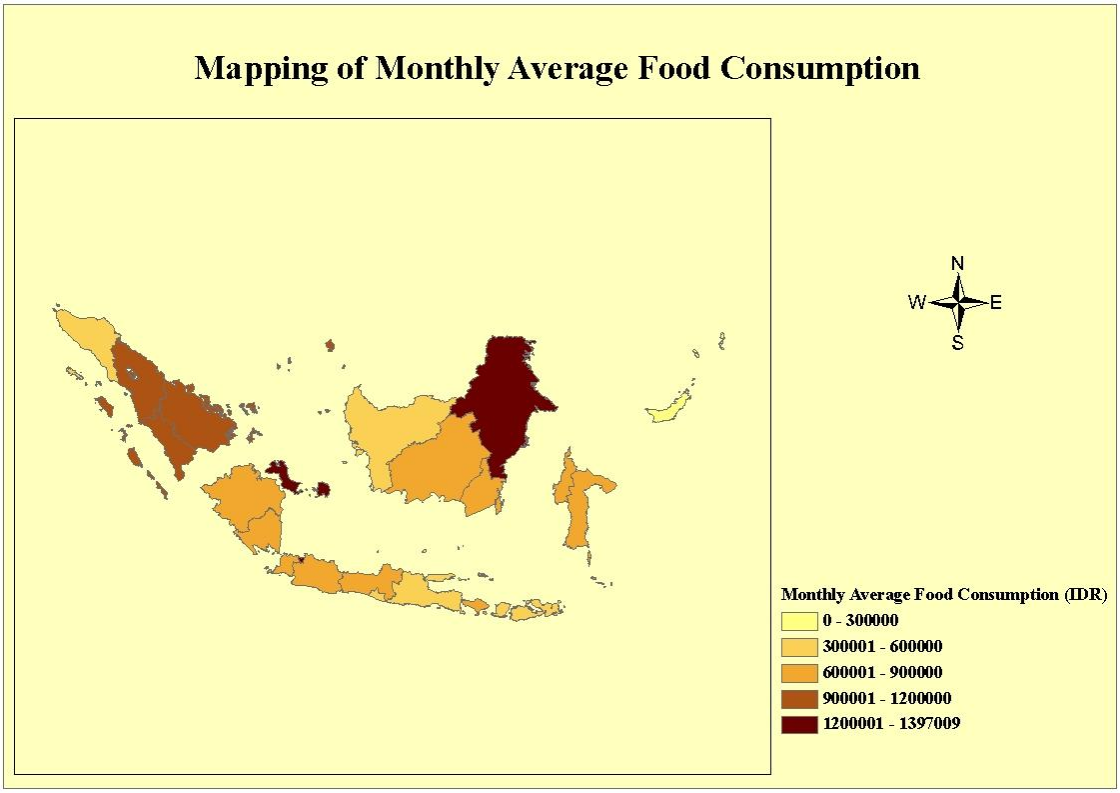
To test the hypothesis, this paper uses spatial analysis by utilising Geographic Information Systems to create a map. There are basically two steps in examining the geographic relationship between international remittances and deprivation. The first step is to map the geographic distribution of deprived households and the second is to map the geographic location of the households who receive international remittances. From these

two steps, it can be seen from the spatial analysis whether the two maps produce a similar geographic pattern or not. The hypothesis is to test whether households who receive international remittances are indeed the deprived households. This paper uses data from the fourth wave of the Indonesia Family Life Survey (IFLS4) year 2007/2008. IFLS4 is conducted jointly by RAND, the Centre for Population and Policy Studies at the University of Gadjah Mada and the METRE Survey. This paper also uses softwareArcGIS Version 9.3.1 to create the maps.

Food Consumption and Deprived Households

As food consumption is one of the determinants to measure poverty line, this paper focuses on food consumption to determine what constitutes a deprived household. Figure 1 shows the mapping of monthly food consumption peraverage household in each province. It is understood that the IFLS does not cover all provinces in Indonesia, thus Figure 1 only shows provinces covered by the survey. Figure 1 is portrayed based on IFLS data from 12,977 households spread throughout 23 provinces. It is also noted that the IFLS data does not represent the entire population of Indonesia. The limitation is that some provinces for instance have very few household respondents than others. Even so, IFLS is worth studying because of the large coverage of provinces and thenumber of households that participated in the survey.

Figure 1. Mapping of Monthly Average Food Consumption



The mapping of deprived households in each province is subsequently illustrated in Figure 2. The measurement criteria for determining what constitutes a deprived household is solely based on food consumption and BPS (Badan Pusat Statistik) poverty line. It calculates the number of households with monthly food consumption less than the BPS poverty line per capita (in the year 2007 it is IDR 166,697 per capita per month). Based on this information, there are 2,174 deprived households or 16.75% of the total 12,977 households. This percentage figure resembles closely the BPS figure which states that 16.58% of Indonesia's residents were living below the poverty line as of March 2007 (BPS, 2007), although discrepancy occurs as food consumption per household is being matched directly with poverty line per capita. It acknowledges the limitation that it does not include other household consumptions and does not use the per capita measurement unit (i.e. per household is used instead).

The map on Figure 2 shows that the province with the largest number of deprived households is Jawa Barat, followed by Jawa Timur and Jawa Tengah. Figure 3 shows in detail the percentage of total deprived households in each province. It is noted that only 20 provinces (out of 23 in the survey) have a deprived household(s) in it. The possible explanation is because lack of respondents for those particular provinces.

The first step of using spatial analysis to map the deprived households in each province is, therefore, completed. The second step is then to map the distribution of households receiving international remittances in each province.

Figure 2. Mapping of Number of Deprived Household

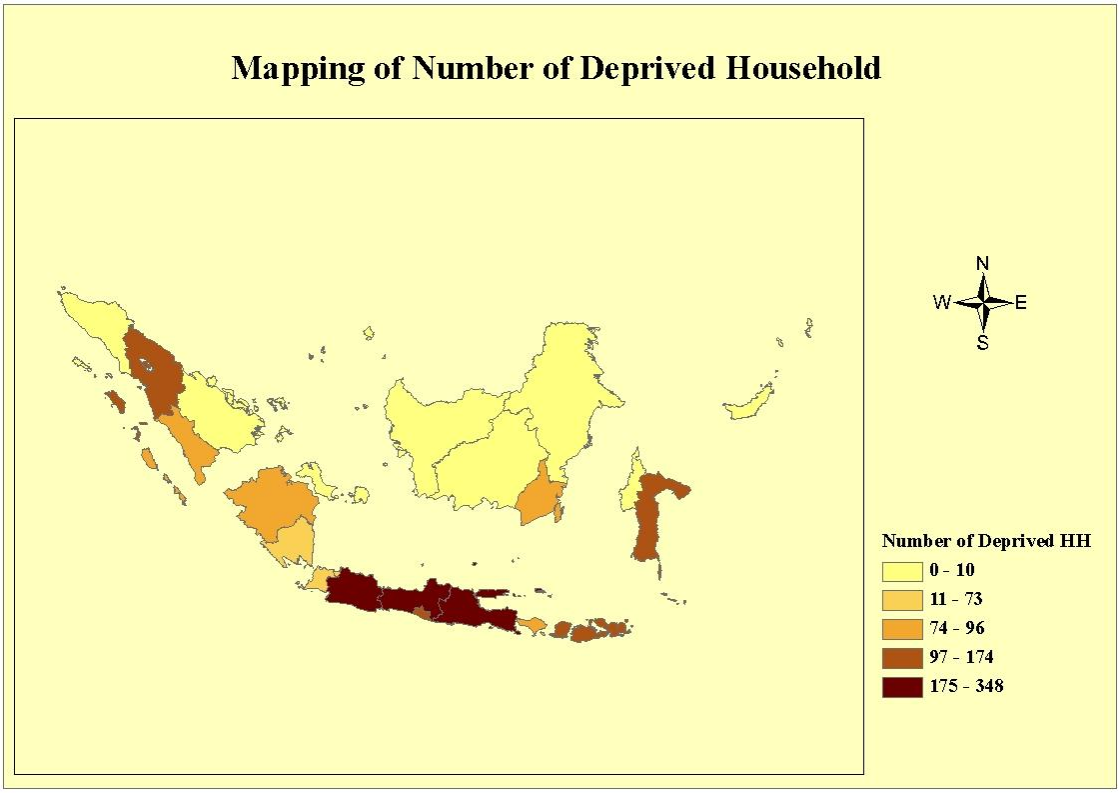
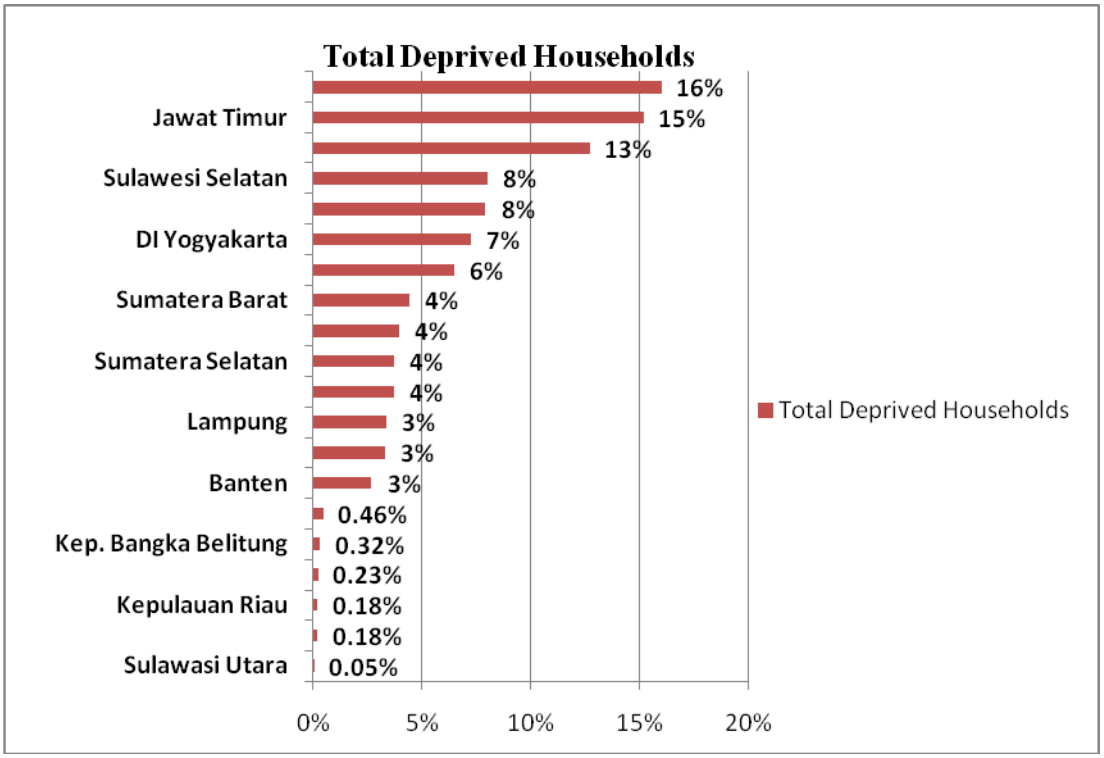


Figure 3. Total Deprived Households



Source: Indonesia Family Life Survey-fourth wave

Deprived Households and International Remittances

In order to examine the spatial relationship of deprived households and international remittances, the second step of mapping households who receive international remittances is established. Figure 4 presents the distribution of households receiving international remittances in each province. It is clearly seen that some provinces have a larger proportion of households receiving remittances although it is also understood from the map that not all provinces have households receiving international remittances.Only 14 provinces (out of 23 provinces in the survey) have households that receive international remittances. It may have been explained in a previous study of Adams and Cuecuecha (2010) that not all householdshave migrants whoremit. A prior study of de la Briere *et al*. (2002) also confirmed that in general, half of migrants do not remit. There is also the limitation that the IFLS survey is not designed as a remittances survey and therefore the number of households who receive international remittances in this survey is considerably small.

Only 1.90% of households (out of the total households) receive international remittances. The province with the most number of households receiving remittances is Nusa Tenggara Barat, followed byJawaTimur and Jawa Barat.Figure 5 describes in detail the percentage of households receiving remittances in each province.

Figure 4. Mapping of Number of Household Receiving Remittances

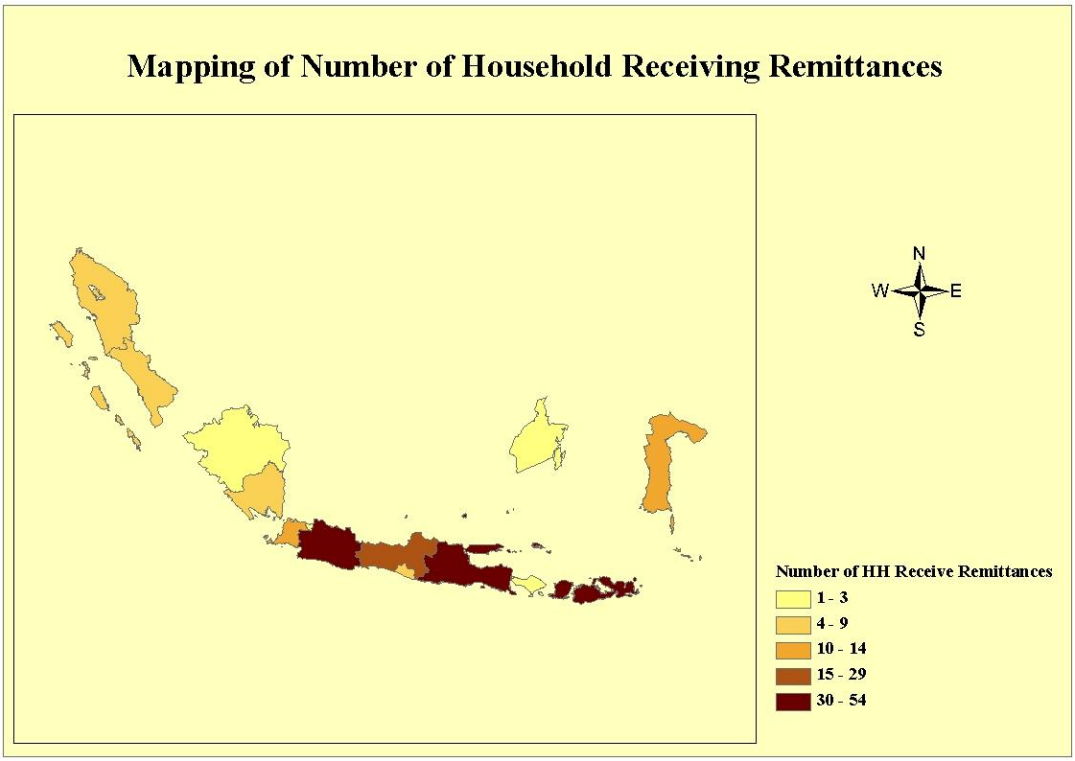
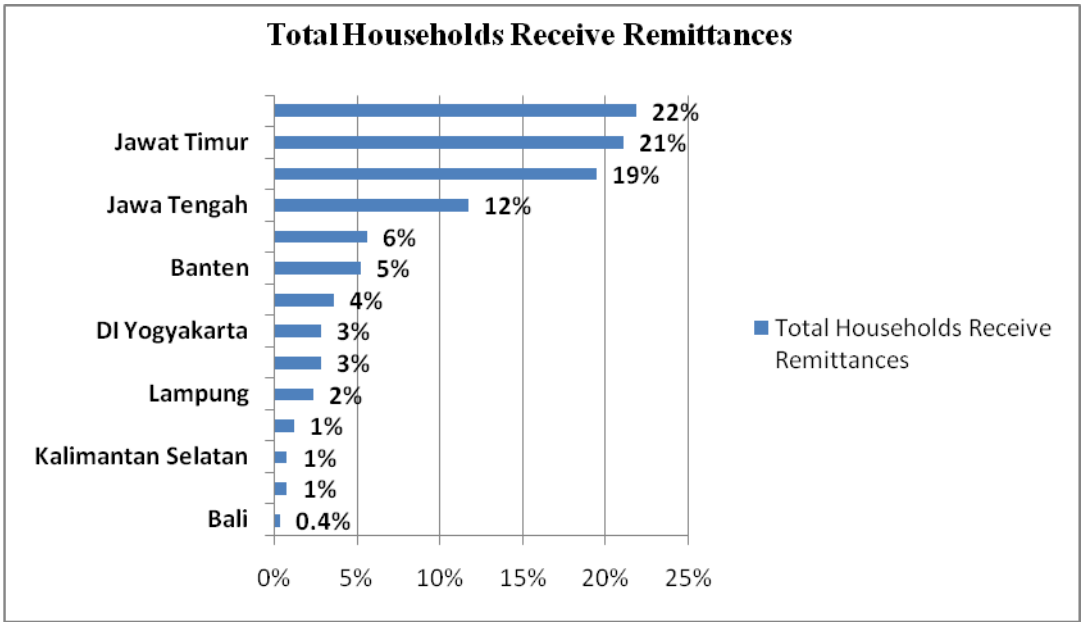


Figure 5. Total Households Receive Remittances



Source: Indonesia Family Life Survey-fourth wave

Despite the limitation that the data is not geographically representative, i.e. each province does not have an equal number of household respondents, the Indonesian

Family Life Survey provides useful data and presents a powerful map on linking international remittances and deprivation. The two steps for testing the hypothesis that international remittances are related to deprivation are explained in maps, mainly through Figure 2 and Figure 4. On linking these two maps, the spatial analysis confirms similar geographical patterns in Figure 2 and Figure 4.

Looking at the province level, the maps show a spatial relationship between deprivation and international remittances, that is, provinces with a large number of households receiving remittances (Figure 4) are more likely to be provinces with a large number of deprived households (Figure 2).It could also be seen from the comparison of the charts that the top five provinces with the largest percentage of households receiving remittances (Figure 5) are also the top five provinces with the largest percentage of deprived households (Figure 3). The provinces of Nusa Tenggara Barat, JawaTimur, Jawa Barat, Jawa Tengah, and Sulawesi Selatan, are the top five of both international remittances and deprivation.

Through the spatial analysis, the hypothesis that international remittances are linked with deprivation is evident. In other words, through the mapping technique, there is a strong geographic indication that international remittances are linked with deprivation of the households. More precisely, there is a strong possibility that international remittances are more likely to be received by poorer households – according to the level of food consumption.

Thus, the result strengthens the previous findings of Adams and Page (2005), Acosta *et al*. (2006), and Adams and Cuecuecha (2010) that international remittances are undeniably linked with poverty as this study shows a strong indication that international remittances are more likely to be received by poorer households.

Conclusion

The hypothesis that international remittances are linked with deprived households is tested using the Indonesia Family Life Survey-fourth wave (IFLS4) data. Geographic Information Systems (GIS) is used as a tool to present spatial analysis of international remittances and deprivation. The food consumption level is used as an indicator of deprivation. The method consists of two mapping steps: the first is to produce the map of total deprived households in each province, and the second is to create the map of total households receiving international remittances in each province. By looking at the two maps, the spatial analysis confirms a similar geographical pattern between international remittances and deprivation. The result shows that provinces with a large number of household receiving international remittances are certainly provinces with a large number of deprived households. The top five provinces with the largest number of households receiving remittances are: Nusa Tenggara Barat, JawaTimur, Jawa Barat, Jawa Tengah, and Sulawesi Selatan. These are also the top five provinces with the largest number of deprived households. The spatial analysis shows a strong indication that international remittances are more likely to be received by the deprived households.However, there is the limitation that the results do not suggest any statistical correlation between international remittances and deprivation.

This paper also demonstrates the usefulness of GIS to project the socio-economic characteristics of Indonesian households in various provinces. It shows how complex socio-economic data can be analysed using a simple mapping technique. It is therefore recommended as an innovative tool to understand the socio-economic issues affecting the society.

Acknowledgement

Funding from the Ministry of National Education of Indonesia through P3SWOT scholarship is gratefully acknowledged.

About the Author

The author is a Ph. D Candidate at London Metropolitan University.

References

Acosta, P., Calderon, C., Fajnzylber, P. and Lopez, H. (2006) 'Remittances and Development in Latin America', *World Economy*, 29 (7), 957-987.

Adams, Jr., R. and Cuecuecha, A. (2010) 'The Economic Impact of International Remittances on Poverty and Household Consumption and Investment in Indonesia', World Bank Policy Research Working Paper 5433, Washington, DC: World Bank.

Adams, Jr., R. and Page, J. (2005) 'Do International Migration and Remittances Reduce Poverty in Developing Countries?',*World Development*, 33 (10), 1645-1669.

Badan Pusat Statistik (2007) 'Tingkat Kemiskinan di Indonesia Tahun 2007', *Berita Resmi Statistik*, 38/07/Th. X, 2 July 2007.

Chrisman, N.R. (2003) *Exploring Geographical Information Systems*, 2nd ed., New Jersey: Wiley.

Coy, M., Kelly, L., Foord, J., Bowstead, J. (2011) 'Roads to Nowhere? Mapping Violence Against Women Services', *Violence Against Women*, 17 (3), 404–425.

de la Briere, B., Sadoulet, E., de Janvry, A., and Lambert, S. (2002) 'The Roles of Destination, Gender and Household Composition in Explaining Remittances: An Analysis for the Dominican Sierra', *Journal of Development Economics*, 68, 309-328.

Hamnett, C. (2003)*Unequal City: London in the Global Arena*, London: Routledge.

Longley, P.A., Goodchild, M.F., Maguire, D.J., Rhind, D.W. (2011) *Geographic Information Systems and Science*,3rd ed., New Jersey: Wiley.

Maksum, C. (2004) 'Official Poverty Measurement in Indonesia', Paper Presented at 2004 International Conference on Official Poverty Statistics, 4-6 October 2004, Mandaluyong City, Philippines.

RAND, the Centre for Population and Policy Studies (CPPS) of the University of GadjahMada and Survey METRE (2007/8)*Indonesia Family Life Survey(IFLS4)*.

Ratha, D., Mohapatra, S., Silwal, A. (2011) 'The Migration and Remittances Factbook 2011', Washington DC: World Bank Migration and Remittances Unit.

Sipe, N.G. and Dale, P. (2003) 'Challenges in Using Geographic Information Systems (GIS) to Understand and Control Malaria in Indonesia', *Malaria Journal*, 2 (36).

Stark, O. and Taylor, J.E. (1989) 'Relative Deprivation and International Migration', *Demography*, Vol. 26, pp.1-14

World Bank (2011) 'Migration and Remittances Data', Available from

<www.worldbank.org/prospects/migrat
ionandremittances>