

FACTORS IMPACTING ON RURAL LIVELIHOOD IN NORTHEAST THAILAND DURING THE PERIOD OF ECONOMIC GROWTH

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ABSTRACT

Rural farmers in Thailand gained increased opportunities for off-farm employment during the period of remarkable economic growth from the mid-1980s. They are believed to have purchased long-desired consumer goods with their irregular cash income to improve their quality of life. While this is to some extent true, I show here using my own developing GIS tool on Northeast Thailand that a reduction in the number of children per household had a greater impact on rural livelihood. Geographic-oriented rather than administrative-oriented statistical analysis can produce many fruitful results. This is a typical practical application of GIS to the field of sociology.

1. INTRODUCTION

The remarkable economic growth in Thailand between the mid-1980s and the mid-1990s brought about changes in livelihood in both urban and rural areas. Rural farmers gained increased opportunities for off-farm employment, and it is commonly believed that they purchased long-desired consumer goods like television sets, motorcycles, and farm machinery with their surplus cash income.

Here, I examine the basis for this supposition as part of my study of socio-economic changes in rural livelihood based on numerical evidence not of targeted villages as in a case study but of the rural areas of Northeast Thailand. The present paper discusses the factors impacting on rural livelihood in Northeast Thailand during the period of remarkable economic growth from 1986 to 1996.

2. MATERIALS AND METHODS

2.1 KCC2K

Every two years since 1986, the National Rural Development Committee in Thailand has conducted a village-level survey, NRD2C, or *Ko Cho Cho Song Kho* (KCC2K) in Thai, in cooperation with the Department of Community Development, Ministry of Interior and the Information Processing Institute for Education and Development, Thammasart University. It encompasses all villages in rural areas of the kingdom, covering a wide range of information related to the socio-economic status of rural communities, such as infrastructure, agricultural

production, home industry, education, and hygiene. Since the 1986 survey, the results have been input into a database. The KCC2K database is the main data source of this study.

In addition to the database, agricultural statistics published by the Office of Agricultural Economics were used. The survey unit of the KCC2K database is a village while that of agricultural statistics is a province. As a preliminary step, values on the planted area in the KCC2K were adjusted so that the total value for a province equaled the official value quoted in the agricultural statistics.

2.3 NETVIS

To clearly interpret the KCC2K database, I developed a spatial information system application called NETVIS, Northeast Thailand Village Information System (Nagata, 1996a; 1996b). The prime unit of the NETVIS is an administrative village, or *muban* in Thai, of which there are about 27,000 *muban* in the area. Since the polygonal geo-references of the administrative boundaries of individual *muban* are not readily available, point geo-references are used in the NETVIS. The geo-reference of each *muban* is represented by the central location of the settlement. This is justified by the fact that, with the exception of a small number of scattered settlements in frontier areas, the great majority of administrative villages in this area coincide with a single clustered settlement.

Socio-economic data on about 27,000 villages can be accessed and drawn individually on a map. However, a GIS output of 27,000 dots on one map is not practically convenient. Many overlapping marks emphasize the village density, or the population density, rather than the characteristics of the villages themselves. It is difficult to differentiate values clearly among villages where villages are crowded together. To avoid these inconveniences, the NETVIS adopts a mesh interpretation. The value of each mesh represents either a weighted average or a sum of villages in the mesh, depending the property of the original value. The meshes are of three-minute intervals of both longitude and latitude. The three-minute intervals create a pseudo-square mesh of about 30 square km. After the geo-feature conversion from point to mesh, about 5,900 meshes are needed to constitute Northeast Thailand. Of these, values are calculated for about 5,200 meshes containing 5 to 6 villages on average. The remaining 700 meshes have no administrative village at the center point.

The KCC2K database offers very useful information, particularly for the purpose of investigation of a large region. However, it is undoubtedly contains errors, arising from careless mistakes, questions essentially difficult to answer accurately, and so on. Their frequency of occurrence, which differs from one item to another, is difficult to assess; and the calculation of an average in a mesh is also effective to minimize these errors.

The mesh method also has the advantage of allowing statistical analysis from a standpoint other than that of the hierarchical local administration. Local people move freely across local administrative boundaries, and some farmers even have their farmland in a neighboring district to their residence. Their activities are constrained more by considerations of distance and time than by administrative boundaries. The mesh method takes account of geographical locations, not administrative boundaries, and villages are grouped naturally by geographical proximity rather than by administrative divisions.

2.4 Local Administration

Administratively, Northeast Thailand consists of 19 provinces (*changwat*), which constitute the top level of local administration. The second level consists of about 320 districts (*amphoe*), and the third level of about 2,500 sub-districts (*tambon*), together with tens of cities (*thesaban*). At the lowest level is an administrative village (*muban*), of which there are more than 30,000. The average size of a rural *muban* is about 100 households or about 500 people. I suppose that *tin*, *huyen*, and *xa* in Vietnamese system correspond to *changwat*, *amphoe*, and *tambon*, respectively. The KCC2K survey only targets *muban* in rural areas, excluding those in cities and urban areas (*sukhaphiban*).

2.5 Simple Regression Analysis

To extract significant relations among socio-economic factors which are registered in the KCC2K database, I calculated correlation coefficients of thousands of combinations among them using the NETVIS. Although a given factor might be expected to correlate with multiple other factors, I employed simple regression analysis as a starting point for further analysis. Simple regression analysis alone revealed some thought-provoking facts on changes in rural livelihood.

3. RESULTS

At present, the NETVIS covers 6 survey years of the biannual KCC2K from 1986 to 1996. Among thousands of combinations, about 500 combinations have at least one absolute value of correlation coefficient of more than 0.2, which means there might be slight relationship between the two factors. Further more, 92 cases have at least one coefficient of more than 0.4, which means there might be a midrange relationship.

This study looks at cases related to work away from home and number of children in detail.

3.1 Work Away From Home

Off-farm jobs have long been an important source of cash income for rural farmers, and nowadays they are indispensable to most farmers. There are many kinds of off-farm jobs, such as home industry, small vending at a local market, and work away from home. Destinations for such work vary from neighboring towns to the Bangkok metropolitan area, and the kinds of job vary from agricultural labourer to factory worker.

Work away from home here is defined as work in any kind of job at a location outside the sub-district (*tambon*) of residence. The number of households in which one or more members engage in work away from home is counted according to the criteria of the original KCC2K survey.

Figure 1 shows the changes of interquartile ranges of work away from home. It reveals, for example, that the number of meshes in which up to 50 percent of households are involved

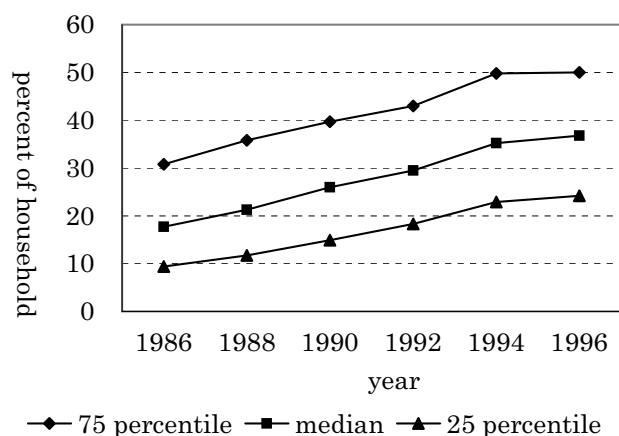


Figure 1 Work away from home

in work away from home amounted to 75 percent of total meshes in 1996. It also shows that less than 20 percent of households were involved in work away from home in more than 50 percent of meshes in 1986, the figure had fallen to less than 25 percent of meshes in 1996. Overall, the proportion of households gaining income from work away from home increased by roughly 15 to 20 percent in the ten-year period in most areas.

Table 1 shows correlation coefficient between work away from home and various factors related to quality of life. The figures in this table do not reveal any significant linear relationships.

3.2 Children

Figure 2 shows the changes in number of children per household over the ten-year period. Here, children are defined simply as household residents aged 14 years or less, regardless of relationship or economic dependency. The median value of the Figure 2 is very close to the total fertility rate of Japan, that is 1.36 in 2000. However, these two numbers

Table 1 Correlation coefficient between work away from home and quality of life

	1986	1988	1990	1992	1994	1996
Sufficient drinking water *	—	0.006	0.081	0.035	-0.024	-0.002
Flush toilet *	0.112	0.021	0.031	0.025	0.013	0.104
Hygienic kitchen *	—	—	—	0.043	0.052	0.021
Television set **	0.158	0.066	0.095	0.063	0.060	0.075
Motorcycle **	-0.017	-0.047	-0.058	0.003	0.031	0.056
Pick-up truck **	-0.053	-0.059	-0.075	-0.053	-0.043	-0.081
University students ***	0.154	0.112	0.107	0.133	0.088	0.064

* Proportion of households with; ** Numbers per household; *** Proportion in the total population

account for totally different measures.

According to the Figure 2, the number of children per household decreased by 0.6 to 0.7 in the ten-year period throughout the region. Figure 3 as a reference shows that the size of household also decreased by about 0.7 in the same period. Therefore, reduction in household size is a direct reflection of the reduction in the number of children in the area.

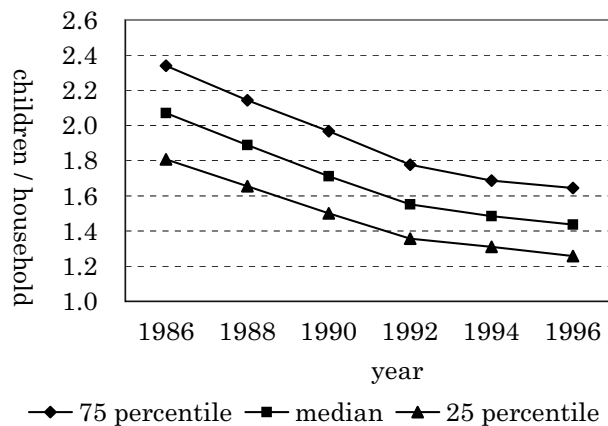


Figure 2 Number of children

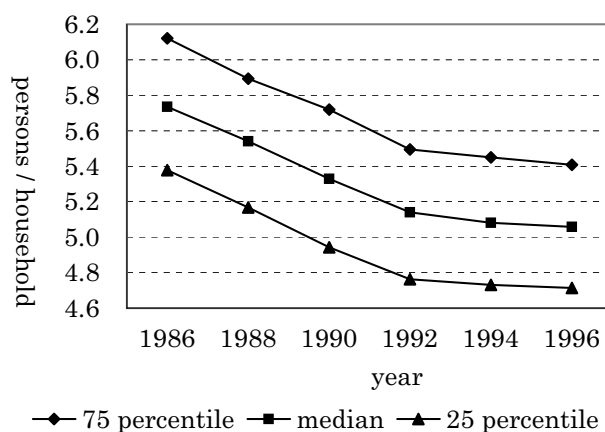


Figure 3 Size of household

Table 2 shows the correlation coefficients between number of children and factors related to quality of life. In contrast to Table 1, the figure indicate the possibility of slight or midrange linear relationships. In general, these factors with quality of life show negative relationships with number of children. Flush toilets are now very common throughout the region and there are no big differences between areas, so that the figures for later years lose significance. On the other hand, pick-up trucks were rare at the beginning, but gained popularity more in later, the coefficients show stronger relationships in later years.

Number of children clearly contrasts with work away from home in its correlation with factors of quality of life. Work away from home contributes to enrichment of farmers' quality of life less than we tend to imagine. Rural farmers choose low birth rate to enrich their quality of life, or to say the least, to save their cash to buy modern commodities and to provide their children with higher education.

Table 2 Correlation coefficient between number of children and quality of life

	1986	1988	1990	1992	1994	1996
Sufficient drinking water *	—	-0.226	-0.260	-0.170	-0.096	-0.121
Flush toilet *	-0.279	-0.291	-0.301	-0.140	-0.066	-0.069
Hygienic kitchen *	—	—	—	-0.225	-0.163	-0.107
Television set **	-0.226	-0.257	-0.284	-0.253	-0.198	-0.194
Motorcycle **	-0.221	-0.247	-0.283	-0.264	-0.261	-0.230
Pick-up truck **	-0.087	-0.129	-0.174	-0.206	-0.198	-0.226
University students ***	-0.206	-0.238	-0.242	-0.226	-0.227	-0.210

* Proportion of households with; ** Numbers per household; *** Proportion in the total population

4. DISCUSSION

The method employed in this study is not complete from the viewpoint of statistical analysis, and further statistical tests are necessary before firm conclusions can be drawn. However, I believe that this is a practical method to sift through factors for further investigation. Furthermore, the NETVIS as a GIS application can present the results of statistical analysis in the form of spatial distribution, and it allows easier spatial investigation according to the user's criteria. For example, we can compare very easily the distribution of meshes meeting prescribed criteria in terms of work away from home and number of children.

The more closely we observe human communities, the more factors there should be from a socio-economic perspective. Many countries have been conducting nationwide socio-economic surveys aiming to promote economic development especially in rural areas. However, they use the results only to know the present situation of each local administration level in order to assign subsidies with weighting. Politically, this might be the only option, even though it uses merely a fraction of the treasure house of information. Academically, however, we would like to get the utmost from it. In particular, a regular survey like the KCC2K embraces strong potentials for analysis not only geographically but also time-sequentially. We need much more experience with studies like this both to encourage the wide-ranging social surveys and to extend the use of GIS applications in the field of sociology.

5. REFERENCES

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