Ⅳ Regional Structure Design Mainly Focused on Transportation Infrastructure Construction Supporting Industries Development in Vientiane Capital Area

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1. BACKGROUND

In order to move from the status of “Least Developed Country” to the status of “Developing Country” by the year 2020, the Government of the Lao PDR has instructed all ministries to formulate development strategies for the period 2000-2020 for their respective sectors. And some developed countries such as Japan and world wide organizations such as United Nations are trying to offer financial and technical support to Lao PDR under the title of removing poverty.

And since the Independence Day (1975)until recently, most development and poverty reduction efforts have been compartmentalized, focusing on either “urban” or “rural” issues with little consideration of the interrelations between the two; however, in reality there are economic and demographic linkages reflected in the flows of goods, services, people, labor, capital, and information across the urban and rural space. The linkage between the rural and urban area will help to shrink the gap on development.

Not only the linkage inside is important, for quick development, but also the linkage with outside international environment is very valuable. How to export more products in low cost and how to absorb more international investment and visitors are the most two direct issues. Solving these will bring Lao PDR more income, chances and activation.

So regarding the requirement of enforcing the communication inside and outside, we put the emphasis on the transportation infrastructure construction.

2. THE GEOGRAPHICAL IMAGE OF THE SUBJECT AREA

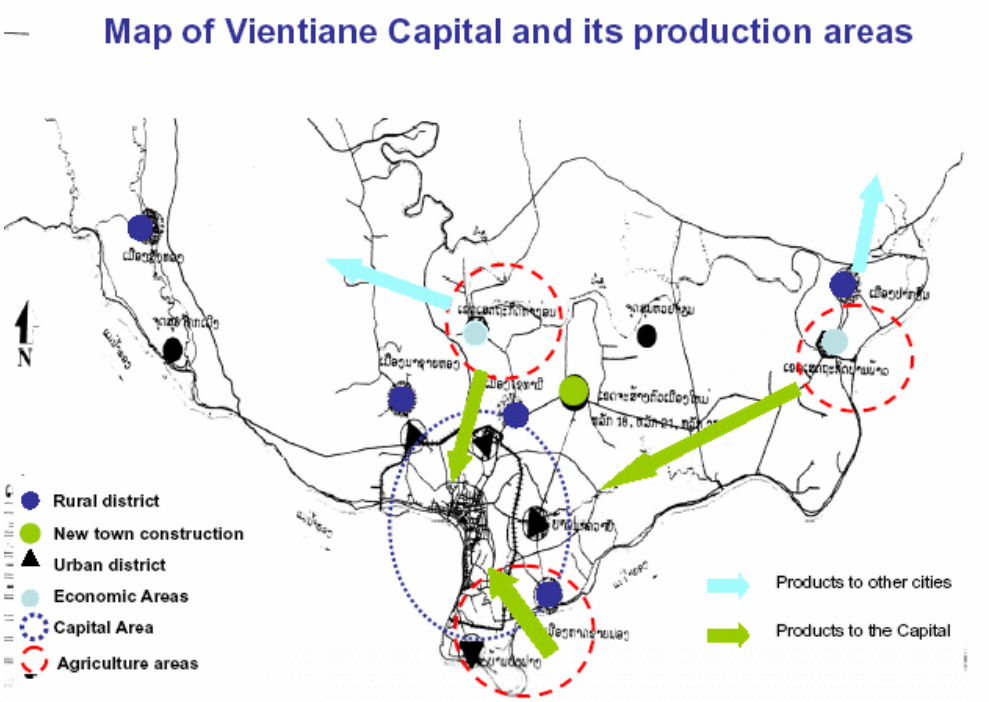

Fig. 1 Geographical Image of Vientiane Capital

The Vientiane Capital metropolitan area is the subject area of this research. This area is the most important part of this country, with 5 rural districts, 3 agriculture zones centered on the capital core. One new town is under construction with a big international airport. Fig.1 shows all the information clearly.

The geographical condition of the area is not very favorable for transportation because of mountainous and with Mekong River along the border of the country with Thai. So for transportation, by air, by boat and by road are three main ways, and summarized into the integrated transportation system.

3. CONCEPTUAL DEFINITION OF THE RESEARCH SYSTEM

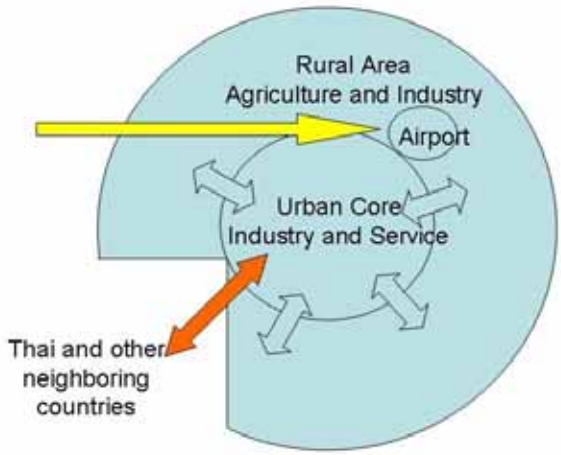

Fig. 2 Image of the Planning System

In the research, the metropolitan area is divided two parts urban core and rural area. Urban core is occupied by industry and service with big population, while the rural area has been positioned with the function of providing agriculture products to urban area and the industry with low cost. Transportation ways are limited in by air, river and road according to the geographic condition. Inner communication, in another word, the linkage of urban and rural area, will be supported mainly by road. While river helps to transport products to neighboring countries and transportation by air aims other countries. Also airplane serves important role in bring visitors to this land with long history and nice natural sightseeing resource. Fig. 2 is the image of these concepts.

Supposing enough loans from other countries or organizations like Japan, how could government arrange the financial power in the transportation infrastructure construction from three aspects by air, river and road transportation for maximizing the effect as much as possible? The regional systems analysis is expected to clarify the function structure between infrastructure construction and the increase of the income in agriculture, industry and service. And setting target year T for timing research, we try to realize the following objective:

$$\max \sum_{t=1}^{T} \left(I_1(S,t) + I_2(S,t) + I_3(S,t) \right)$$

$$S_t = S_t(S_{air}, S_{river,} S_{road})$$

$$S_{air} + S_{river} + S_{road} \le S = \sum_{t=1}^{T} GF(t) + \sum_{t=1}^{T} L(t)$$

$$S_{air} = \sum P_{ij}^{air} \times c_{ij}^{air}, \quad S_{river} = \sum P_{ij}^{river} \times c^{river}_{ij}, \quad S_{road} = \sum P_{ij}^{road} \times c_{ij}^{road}$$

$$P_{ij}^{air} = \begin{cases} 1, & done \\ 0, & notdone \end{cases}, \quad P_{ij}^{river} = \begin{cases} 1, & done \\ 0, & notdone \end{cases}, \quad P_{ij}^{road} = \begin{cases} 1, & done \\ 0, & notdone \end{cases}$$

where, $I_1(S,t)$ is the function of the income from agriculture under the construction pattern S in year t, which shall be set up based on the relationship structure. So, $I_2(S,t)$ is the function of the income from industry, $I_3(S,t)$ is the function of the income from service. S_t is the pattern of construction cost in facility for transportation by air S_{air}, by river S_{river}, and by road S_{road}, the total amount of a year is limited by a setting S. $P_{ij}^{air}, P_{ij}^{river}, P_{ij}^{road}$, respectively, are the project i in phase j of air, river and road categories, analogously, c represents the cost. And L function counts for the amount of loan, GF function tells the fund from Laos Government. They constitute the main financial source to be the restriction S. Employment will be increased together with the improvement of the industries productions, which will be counted in later in detailed formulation. The value of the currency will also be considered.

4. CONCLUSION

This report is just a brief description about the research in Laos. A proper proposal, which could give some valuable information to the Laos's government and related organizations, is expected as the result.