A Study of Infrastructure Investment Planning regarding Tourism Development of Sukhothai Historical Park: Alternatives and Socio-Economic Impacts to the Local Communities

การศึกษาทางเลือกและผลกระทบด้านสังคมและเศรษฐกิจต่อชุมชนท้องถิ่นจากการวางแผนการลงทุนด้านโครงสร้างพื้นฐานสำหรับการพัฒนาด้านการท่องเที่ยวในพื้นที่อุทยานประวัติศาสตร์สุโขทัย

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Abstract

Since 1987, the Thai government has recognized and begun adopting a new approach of development by slowly shifting focus away from a growth orientation approach to a balanced socio-economic development approach as mentioned in the Eighth National Economic and Social Development Plan (1997-2001) aiming to improve the well-being of all people in the Thai society.

Though the idea has been limited to development at the regional level at the beginning, the government has latterly realized an importance of development at the local level with respect to the potentials, preferences, and functions of the area.

As a case study, this study, therefore, aims to investigate and evaluate socio-economic impacts potentially created to the local communities with regard to the required additional infrastructure investment to support tourism development of Sukhothai Historical Park and the associated historical towns by the two alternatives, i.e. to develop Phitsanulok-the so-called regional-oriented development approach and to develop Sukhothai-the so-called local-oriented development approach, based on development objectives of the present development plans and policies using a scientific method.

บทคัดย่อ

นับจาก พ.ศ. 2530 เป็นต้นมารัฐบาลไทยได้ตระหนักและเริ่มเปลี่ยนทิศทางนโยบายการพัฒนาด้านเศรษฐกิจและสังคมของประเทศอย่างช้าๆ จากการพัฒนาที่มุ่งเรื่องการเติบโตในเชิงเศรษฐกิจมาสู่การพัฒนาที่เน้นดุลยภาพทางสังคมและเศรษฐกิจ ดังระบุในแผนพัฒนาเศรษฐกิจและสังคมแห่งชาติฉบับที่ 8 (พ.ศ.2530-2544) ต่อเนื่องถึงฉบับที่ 9 (พ.ศ.2545-2549) โดยมุ่งไปที่การปรับปรุงความอยู่ดีมีสุขของคนไทยโดยถ้วนทั่ว แม้ในช่วงแรกแนวคิดการพัฒนาอย่างมีดุลยภาพนั้น จะถูกจำกัดอยู่เพียงที่การพัฒนาในระดับภูมิภาค ในเวลาต่อมารัฐบาลเองก็ได้ตระหนักถึงความสำคัญของการพัฒนาในระดับท้องถิ่น โดยคำนึงถึงศักยภาพและคุณสมบัติเฉพาะของพื้นที่นั้นๆ สำหรับการศึกษานี้ มีวัตถุประสงค์หลัก คือ การประเมินผลกระทบทางสังคมและเศรษฐกิจต่อชุมชนท้องถิ่นอันเนื่องมาจากการลงทุนด้านโครงสร้างพื้นฐานเพื่อสนับสนุนการพัฒนาด้านการท่องเที่ยว โดยใช้พื้นที่อุทยานประวัติศาสตร์สุโขทัยและเมืองบริวารเป็นกรณีศึกษา ผ่านการเปรียบเทียบแนวทางการพัฒนา 2 ทางเลือก นั่นคือ การพัฒนาเมืองในระดับภูมิภาค โดยมีพิษณุโลกเป็นตัวแทนสำหรับการศึกษา และการพัฒนาเมืองในระดับท้องถิ่น โดยมี

สุโขทัยเป็นตัวแทนการศึกษา ทั้งนี้โดยผ่านการประเมินบนพื้นฐานของวัตถุประสงค์การพัฒนาตามแผนพัฒนาเศรษฐกิจและสังคมแห่งชาติและนโยบายที่ใช้อยู่ในปัจจุบัน ผ่านระเบียบวิธีทางวิทยาศาสตร์ ผลสรุปที่ได้จากการศึกษา คือ การสรุปโดยการอ้างเหตุผลสนับสนุนว่าทางเลือกใดน่าจะเป็นทางเลือกที่เหมาะสมกว่าสำหรับกรณีศึกษานี้ในทัศนะของผู้วางแผนภาค ทั้งนี้ร่วมด้วยข้อเสนอแนะในด้านมาตรการหรือเครื่องมือที่เหมาะสมต่อการส่งเสริมและเพิ่มพูนศักยภาพของทางเลือกในการพัฒนาที่ได้รับการสรุปผลจากการศึกษาว่าเหมาะสมกว่า

Keywords

Infrastructure

In this study, 'Infrastructure' refers to two main groups, i.e. private-related tourism infrastructure and public-related tourism infrastructure. The first group refers to facilities and services created and administered by private agencies for their own benefits, e.g. accommodation, restaurants, travel and tour services, and recreation and entertainment facilities. The latter group refers to facilities and services created and administered by public agencies (or sometimes by private agencies or public-private partnership also) which service the private sector and households as well as enterprises.

The public-related tourism infrastructure is divided into technical infrastructure and social infrastructure. "Technical infrastructure (in the areas of power, transport, water etc.) directly supports economic production processes, whereas the so-called social infrastructure (in the areas of education, health, recreation etc.) has a more direct relationship to human needs..."[1]

Investment

According to categories of infrastructure mentioned earlier, 'Investment' in this study also categorized into two types, i.e. private-related tourism infrastructure investment and public-related tourism infrastructure investment. When cost of infrastructure investment is referred to in this study, it includes only costs of constructing and operating material infrastructure[1] (including wages).

Local Communities

'Local communities' in this sense refers to all private sectors and households as well as enterprises in the respective spatial entity, which means in this study those who are living and/or working within the provincial boundary.

[1] Reimut Jochimsen defined the term 'infrastructure' as the sum of all basic material structures, institutional conditions and human resources available to a society, needed for the functioning of the economic sector. 'Material infrastructure' was defined as comprising all buildings and physical networks (such as roads, pipelines, water ways, sewerage systems etc.) which are directly or indirectly provided and operated by government (or para-governmental) agencies. 'Institutional infrastructure' constituted the basic for the functioning of social and economic activities and induced all written and unwritten laws, regulations, administrative and planning systems, traditions and other behavioural patterns. 'Personal infrastructure' ('human capital') was comprised of the quantity and quality of human resources available to a society. (United Nations Centre for Human Settlement: 6

1. Introduction to the Study

Since 1961, Thailand has embarked upon a succession of five-year national economic and social development plans (NESDP) which set for the government's objectives for the nation during each period. In the past plans, the national economic and social development concept has largely been based on the acceleration of economic growth utilising comparative advantages in terms of natural resources and low-cost labour to produce goods and services for export. Yet, successes in economic growth and material progress to date have not meant that all Thai people are enjoying greater wealth and a substantially improved quality of life. The rapid economic growth has had number of negative effects on Thai culture, traditional ways of life, family, community and social values. The gap between the rich and the poor has been widening over time. The impact on natural resources and the quality of the environment has also given cause for serious concern.

As a result, the government has slowly shifted focus away from government controlled bureaucratic development and has begun to recognize the need for development initiative built from the bottom up since 1987 - the beginning of the Sixth NESDP and has been refined over time until the Ninth NESDP - the current plan which is in fact a continuation of the Eighth plan. The bottom up approach has not been, however, achieved the considerable satisfactory level.

Tourism is recognized as an economic activity that has and will continue to play a vital role in Thailand's future socio-economic development. This industry has considerable impacts on a diverse range of other economic activities and contributes significantly to employment creation, export earning, and government revenue. Accordingly, the Royal Thai Government and the Tourism Authority of Thailand (TAT) recognize the great potential of tourism and are committed to creating tourism as an instrument for sustainable development of the country, which aims to promote the balanced and sustainable development on the basis of self-reliance as well as a fair distribution of income and the well-being of people and to encourage the local administration and budget to meet the need of the local community (NESDB: online).

Though there is fairly detailed information on tourism industry (e.g. number of tourist arrivals, the estimated expenditures, and its contribution to output, income, employment) at the national level, there are only few researches of its contributions and impacts at the local level, particularly on socio-economic aspects. As a result, "A Study of Infrastructure Investment Planning Regarding Tourism Development of Sukhothai Historical Park [1]" would be a good case study for planners in order to have a better understanding of the socio-economic impacts generated by different infrastructure investment planning approaches.

1.1 Research Framework and Methodology

The study aims to investigate and evaluate, from the point of view of a regional development planner, on which of the two development alternatives (different approaches of infrastructure investment planning regarding tourism development of Sukhothai historical park and the associated historical towns) would contribute better effects to the local communities with regard to the present development objectives and strategies. Recommendations on measures to be followed in order to promote and increase the potential of the preferred development alternative are to be presented as a conclusion of the study.

The two alternatives mentioned earlier are a regional centre-oriented approach and a local centre-oriented approach which will be called hereafter as ***'regional alternative'*** and ***'local alternative'*** respectively. Regional alternative is a development proposal following the existing trend which enhances Phitsanulok to be a tourism supporting centre for the lower north. It focuses mainly on efficiency development approach, which is based on maximizing the use of existing well-developed infrastructure, and gaining benefits from agglomeration economy in developed areas. This means investment on accommodation establishments to serve tourism demand of the historical parks in Sukhothai will continue to concentrate in Phitsanulok rather than in Sukhothai. Contrary to the efficiency development approach proposed by the regional alternative, the aim of the local alternative is to encourage local development on the basis of a fair distribution development approach by maintaining Phitsanulok as a main development area as it has been. However, its role of being a supporting centre for historical tourism in Sukhothai will be shifted to Sukhothai - a considerable underdeveloped province with regard to its development potential regarding tourism.

The time horizon for this study is laid down to be the end of the year 2011, based on the implementation period of the Tenth NESDP (2007-2011). Existing situations and relevant development plans [2] are collected and used in order to project tourism development trend of the study area and identify the required additional both private and public-related tourism infrastructure. The future situations with regard to the two development alternatives by the time horizon of the study are then to be projected. Subsequently, the socio-economic impacts potentially created by future tourism development of the two alternatives to the local communities are to be identified, valued, and evaluated.

Finally, the two alternatives of future development are to be compared and comprehensively evaluated from three perspectives, i.e. the government's perspective, the local people's perspective, and the private investor's perspective. From the government and the local people's point of view, the alternatives are to be evaluated by using cost-effectiveness analysis (efficiency per unit cost) by comparing total benefits derived from development alternative in terms of dimensionless utility points [3] (with respect to the development objective priorities) with estimated cost of infrastructure provision (in monetary terms). The result is to be used not mainly to determine the optimum of given alternatives but rather as a learning-process for suggesting appropriate recommendations at the end of the study.

Rate of return on capital is another evaluation considered from the point of view of private investor. It must be, however, noted that the result will be used to investigate on which kind of incentive should be introduced for the preferred alternative in order to create preferred environment of investment, not as a main criteria to determine which alternative is the preferable one.

However, the study deals with complex problems and requires either detailed data or number of assumptions in case that data are not available. Sensitivity analysis is, therefore, considered to be necessary. The four scenarios under different conditions and assumptions are evaluated in order to understand the relative importance of the assumptions and of conceiving variations in their associated numerical values.

Scenario 1 is the main evaluation model while scenario 2, 3, and 4 are testing models of the participation rate and the unemployment rate being applied to the year 2011, of the objective-specific weighting, and of the effectiveness regarding different investment locations in Sukhothai respectively.

Using such methods, information on advantages and disadvantages connected to the alternatives with respect to various aspects are obtained. Recommendations on the measures appropriate for achieving higher efficiency are then to be made for the preferred alternative (with regard to the development objectives and priorities).

1.2 Methodical Framework of Evaluation

The model comprises two main components- (i) the estimation of benefits in terms of dimensionless utility points potentially generated by the development alternative, and (ii) the estimation of costs of providing infrastructure as a time value by discounting to the end of the employed time horizon in 2011. The evaluation is considered not only on a basis of efficiency per unit cost, but also of benefits solely generated and contributed to the local communities as well as some other aspects which are not included in the evaluation model since they could not be numerically valued easily.

Apart from the CEA, the rate of return on capital of the investment of accommodation establishments in different locations is also evaluated as it is a factor determining preference on location in the private investor perspective. The same occupancy rate of accommodation establishments is applied to all locations. The evaluation comprises of processes described as follows:

First of all, indicators for criteria are to be translated and weights are to be assigned according to priority of the development objectives mentioned in development plans. A value tree with development objective-specific weights is then constructed.

Nevertheless, the priority is not clearly mentioned in the development plan. A sensitivity analysis assigning equal weights to both national and regional effect is to be employed, and this equal weighting is then to be applied also to subcriteria and indicators. Furthermore, there are still some other potential uncertainties which would give different results under different conditions. One assumption that would significantly affect the result is that the existing participation rate and unemployment rate in each province will remain unchanged within the employed time horizon. Change of the participation rate and the unemployment rate would result significantly different migration pattern and consequently affect many aspects of the evaluation model such as the cost of providing public-related tourism infrastructure, and the migration effect. Sensitivity analysis is then required to test robustness of the assumption.

Cost items employed to the CEA in the study consists of; (i) total cost of constructing required additional infrastructure of each alternative to serve demand within the employed time horizon, (ii) operating costs of both existing and newly constructed infrastructure with respect to propensity to consume, and (iii) relevant costs of encouraging Sukhothai to be a supporting centre for its own tourists (to be applied to the local alternative only) such as the cost of providing better accessibility to Sukhothai.

1.3 Limitations and General Remarks

Due to the data and time constraint, limitations and general remarks of the study are as follows:

- Usually the main city of the province is called by the name of the province, for instance as 'Phitsanulok' and 'Sukhothai.' In order to avoid misunderstanding, when the name is solely called as 'Phitsanulok' or 'Sukhothai,' it refers to the province as a whole, while the cities will be in this case called as 'Phitsanulok City' and 'Sukhothai City,'
- The impact evaluation of this study could only focus on socio-economic impacts though ecological impacts also play an important role on sustainable development. This is due to two main reasons. Firstly, comprehensive study of impacts in all aspects would not be possible or could not reach the satisfactory level of detail within the limited time of the study. Secondly, while there are number of researches on ecological impacts from tourism industry at the local level, there is still a lack of such study focusing on socio-economic impacts. As a result, conclusions and recommendations of the study are decided to take into consideration only socio-economic aspects, and excludes ecological aspects;
- Although the hinterland of the development locations which will be affected by the investment is the most suitable spatial entity for an evaluation process, the areas according to the provincial boundary (administrative boundary) is used instead in this study. This is because most of the data are available only at the provincial level, and consequently do not allow the study to go in such detailed analysis. Results derived from the evaluation process are, therefore, to be aware of shortcomings, e.g. in fact factors affecting the development and impacts being created are usually neither evenly distributed through the whole province nor limited within the administrative boundary as it is assumed to be in the study, particularly when the development does not take place at the centre but near to the border of the administrative boundary as it is in this case;
- Some statistical data which are required at the provincial level are not available. Estimation is, therefore, made in order to adjust the available data at the national level to be usable at the provincial level;
- Statistical data at the provincial level being used in this study are average values from the whole province and do not truly represent the real situation of the impact area (the hinterland affected by the investment); and
- Since tourism industry is considerably sensitive to external factors, long-term forecasting with assumptions that number of factors; e.g. growth rate of visitors going to the study area, percentage share of tourists from visitors, tourist expenditure; will remain unchanged is in fact likely to be uncertain.

As a result, the results provided in this study should be further analysed in more detail before being used as a reference.

1.4 Background of the Study Area

With its prime location of nearly equidistance between the two of Thailand's most important cities, Bangkok - 377 km to the south and Chiang Mai - 333 km to the north, linking the upper northern region, sub-central region and the north eastern region as well as Indo-China neighbouring countries with good transportation network, Phitsanulok has been set as the regional centre of the lower north since 1987 (in the Sixth NESDP - the plan which introduced the concept of promoting regional centre). The province has developed and become an area of high centrality since then. Great amount of investment has been put to Phitsanulok, while Sukhothai, a neighbouring province, was given just a role of a special centre. The intention to regard Sukhothai as a special place due to its historical significance as a former capital city of Thailand is obvious, but this goal has not been successfully achieved.

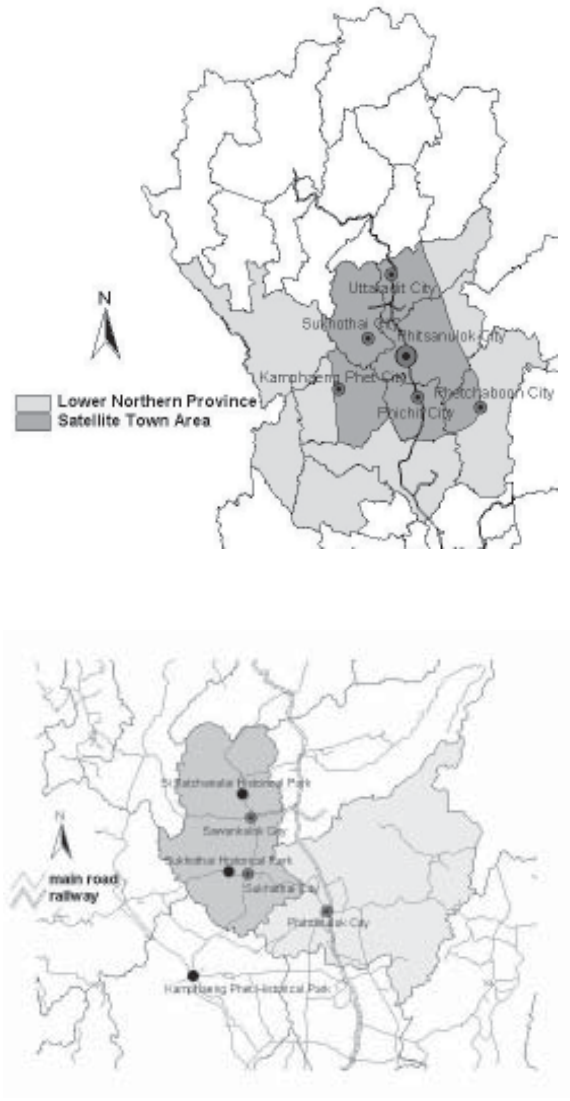


Figure 1 Map of the Study Area

Table 1 Socio-Economic Situation of the Study Area

	Whole Country	Northern Region	Bangkok Metropolis	Phitsanulok	Sukhothai
Area (km^2)	513,115	169,644	1,562	10,815	6,596
Number of Population in 2001	62,308,887	12,152,502	5,782,159	869,566	624,064
Average Population Density in 2001 (inh./km^2)	121.4	71.6	3694.2	80.4	93.1
Average Population Density [4] **Amphoe Muang in 2001 (inh./km^2)**				363	192
Municipal Area				4,929	4,747
Non-Municipal Area				249	143
Participation Rate in 2002 (%)	54.0			51.9	54.0
Unemployment Rate in 2002 (%)	3.7			3.6	5.2
Average Household Size in 2000 (person)	3.6	3.4	3.2	3.6	3.5
Average Monthly Income Per Household in 2000 (Baht)	12,185	8,652	26,909	8,965	7,156
Average Monthly Expenditure Per Household in 2000 (Baht)	10,025	7,318	20,448	7,224	5,892
Gini-Coefficient Value 2000	0.419			0.432	0.406

Sources: 1. Report of the 2000 Household Socio-Economic Survey, National Statistical Office, Thailand.
2. Statistical Reports of Changwat 2002 Edition: Phitsanulok, National Statistical Office, Thailand.
3. Statistical Reports of Changwat 2002 Edition: Sukhothai, National Statistical Office, Thailand.

2. Analysis and Forecasting of Development Pattern

2.1 Tourism Demand Projection

To project number of guests to be shifted from Phitsanulok to Sukhothai, for the regional alternative, it is to be simply projected according to the existing development trend in each province. For the local alternative, the most basic assumption to be applied is that shifting guests must not affect the existing hotel suppliers in Phitsanulok. This means only surplus of the guest arrivals in accommodation establishments from the existing available rooms in Phitsanulok at the desired occupancy rate (basing on an assumption of applying the rate of return on capital at 8.00 per cent per annum for ten years) could be shifted to Sukhothai. Firstly, the available rooms in Phitsanulok will be distributed to domestic guests in Phitsanulok based on an assumption that for the domestic tourist group who stayed overnight in Phitsanulok though they might visit the historical parks in Sukhothai as well, but Phitsanulok is their main destination, they are thus assumed to require an accommodation in Phitsanulok as the first priority, and this will also be applied to the future domestic tourists in Phitsanulok within the employed time horizon.

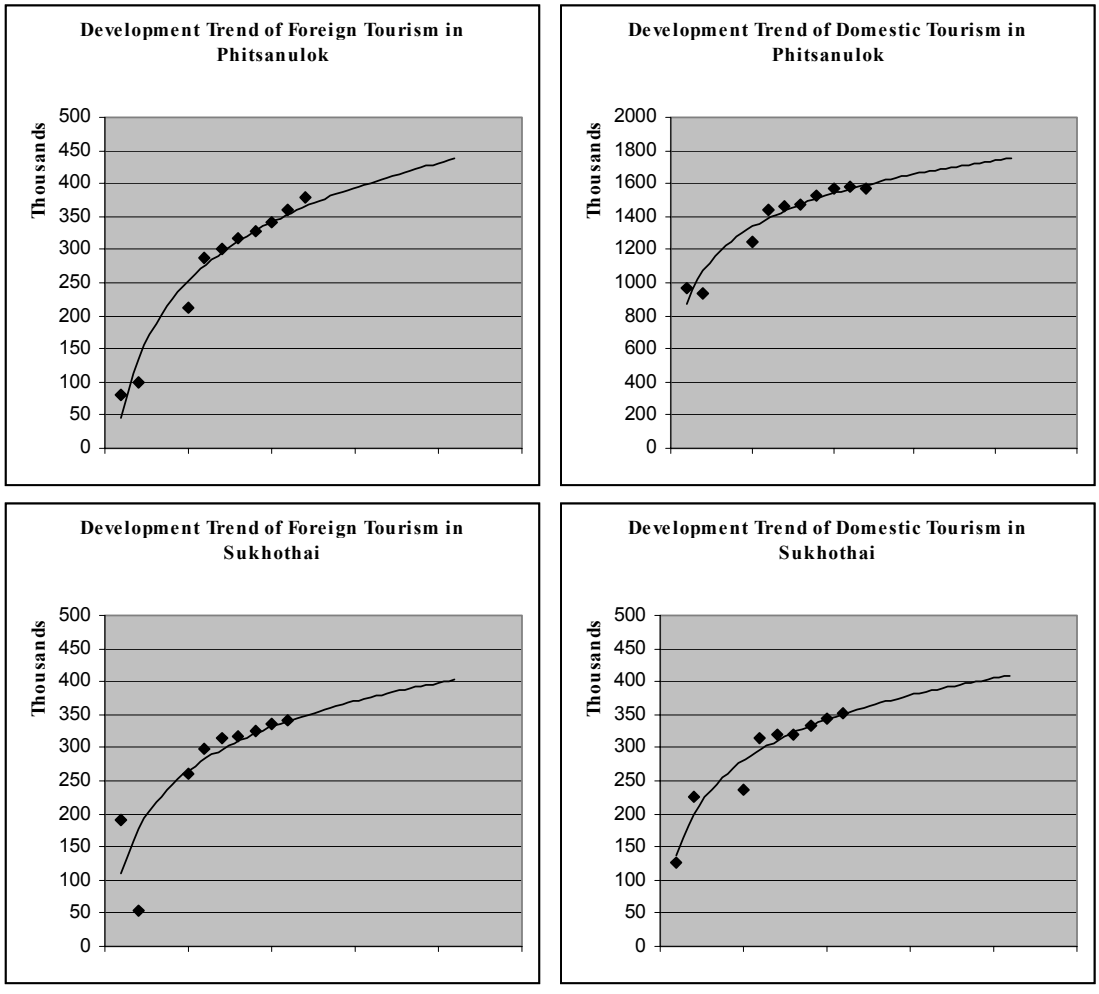


Figure 2 Projection of Number of Visitor by 2011

Unlike domestic tourists, the character of foreign tourists is different that almost all foreign guest arrivals in accommodation establishments in both Phitsanulok and Sukhothai are tourists visiting the historical parks in Sukhothai. As a result, they are assumed not to be affected by being shifted from staying in Phitsanulok to stay in Sukhothai. After distributing domestic tourists to the existing hotel capacity, if there are still some surplus rooms, the rooms are firstly assigned to foreign tourists in Phitsanulok. The excess foreign tourist is then shifted to stay in Sukhothai.

The result shows that based on all aforementioned assumptions, all of the projected foreign guest arrivals in accommodation establishments in Phitsanulok are the surplus from the existing number of room, and that means they could be shifted to Sukhothai. Existing rooms in Phitsanulok are then in principle to serve domestic tourists only. The assumption applied to the local alternative could be concluded that all projected foreign guest arrivals in Phitsanulok in 2011 according to the existing trend are assumed to stay in Sukhothai instead, while all the rest conditions remain the same as they are applied to the regional alternative. This gives the estimated number of guest arrivals in accommodation establishments as summarized in Table 2, and the estimated number of rooms required by the two alternatives in each province are assigned as shown in Table 3 [5].

Table 2 Estimated Number of Guest Arrivals in Accommodation Establishments in 2011

(unit: persons)

	Regional Alternative		Local Alternative	
	Phitsanulok	**Sukhothai**	**Phitsanulok**	**Sukhothai**
Foreign guests	279,262	214,053	0	493,315
Domestic guests	600,254	107,695	600,254	107,695
Total guests	879,516	321,748	600,254	601,010

Table 3 Estimated Number of Required Additional Room by Type of Accommodation Establishment

(unit: rooms)

	Total	**Hotel 2**	**Hotel 3**	**Hotel 4**	**Hotel 5**	**Guest-house**	**Bungalow /Resort**
Existing room in Phitsanulok	2,459	907	459	203	405	160	325
Existing room in Sukhothai	982	0	298	251	203	134	96
Regional Alternative							
Total req. room in Phitsanulok	4,372	1,954	874	352	548	224	421
Total req. room in Sukhothai	1,640	0	513	358	429	195	145
Local Alternative							
Total req. room in Phitsanulok	2,982	965	603	328	506	209	371
Total req. room in Sukhothai	3,030	988	784	382	471	211	195

2.2 Growth Projection and Estimation of Required Infrastructure

2.2.1 Population Projection

First of all, the employment situation in each province in 2011 of each alternative is to be projected. Total number of workplace potentially created according to the regional alternative is to be defined by applying the average annual growth rate of the gross provincial product (GPP) during 1993-1999 and the labour productivity in 1999 (the most current available data) based on an assumption that those two factors will remain unchanged within the employed time horizon. Number of workplace in 2011 for the local alternative is derived by subtracting additional direct, indirect, and induced employment (number of workplaces) created within the province under regional alternative's conditions from the projected employment derived from applying the average annual growth rate as described earlier, and then from adding the employment created by local alternative's conditions. The result is that in 2011 there will be in total 622,682 workplaces in Phitsanulok and 304,419 workplaces in Sukhothai in case of the regional alternative, and 605,238 workplaces in Phitsanulok and 317,193 workplaces in Sukhothai in case of the local alternative [6].

The number of workplace derived from the aforementioned processes is then used to project the number of population in 2011 in the province by applying the participation rate and the unemployment rate in 2001 of each province to both alternatives with an assumption that the population structure as well as the unemployment situation will remain unchanged [7] within the employed time horizon. Then the number of population living in the city is estimated based on an assumption that the share of population in the city relative to total population in the province in 2001 will remain unchanged within the employed time horizon.

The result basing on the aforementioned fundamental assumption of the constant participation and unemployment rate shows that in any case number of population in Phitsanulok will grow with a higher acceleration (annual growth rate of more than 3 per cent) than the average rate

Table 4 Projected Situation of the Study Area in 2011

(unit: persons)

	Regional Alternative			Local Alternative		
	Phitsanulok	**Sukhothai**		**Phitsanulok**	**Sukhothai**	
Total population	1,303,478	623,490		1,265,662	670,526	
Number of workplace	622,682	304,419		605,238	317,193	
	Phitsanul. City	**Sukho. City**	**Sawan. City**	**Phitsanul.City**	**Sukho. City**	**Sawan. City**
Population in the municipal area	185,443	22,081	21,842	180,248	23,007	22,759

Table 5 Projected Situation of the Study Area in 2011 for Scenario 2

(unit: persons)

	Regional Alternative			Local Alternative		
	Phitsanulok	**Sukhothai**		**Phitsanulok**	**Sukhothai**	
Total population	1,241,547	645,760		1,255,152	649,075	
Number of workplace	622,682	304,419		605,238	317,193	
	Phitsanulok City	**Sukhothai City**	**Sawankalok City**	**Phitsanulok City**	**Sukhothai City**	**Sawankalok City**
Population in the municipal area	176,632	22,869	22,623	178,568	22,987	22,739

during 1990 - 2001 (1.87 per cent). This implies that there will be a high level of in-migration to Phitsanulok while it is in the other way round in the case of Sukhothai (that there will be out-migration from Sukhothai instead). The annual growth rate of population in Sukhothai with regard to development of the local alternative will reduce from 1.47 per cent (during 1990-2001) to less than 1 per cent during the time after that until 2011, and will even be negative (-0.06 per cent which implies strong out-migration) for the regional alternative [8].

However, as mentioned that an assumption of the remaining unchanged participation rate and unemployment rate in any case is likely to be unrealistic. As sensitivity analysis is to be employed to check the robustness of the result under different assumptions, the projected number of population using for sensitivity analysis (scenario 2) is to be worked out also.

2.2.2 Required Additional Infrastructure and Relevant Cost Estimation

The required additional infrastructure and relevant cost estimation of the public-related tourism infrastructure and the private-related tourism infrastructure are estimated with an assumption that the level of standard consumption per unit of infrastructure at the moment will remain unchanged even with better supply in the future (it means generation of supply would not increase the marginal propensity to consume or demand) as well as the higher level of development of the region (which normally increases the marginal propensity to consume according to the higher income level). In addition, production functions of all types of infrastructure are assumed to be linear (no scale economies or diseconomies), otherwise it will be specially stated.

1) Public-Related Tourism Infrastructure

The public-related tourism infrastructure in this case is categorized into technical, transportation, and social infrastructure. Since the main objective of this part is to find all relevant costs regarding infrastructure required by each development alternative, only main infrastructure which would contribute to a different cost to each alternative is taken into consideration.

The costs involved are (i) incremental cost of infrastructure required to enhance Sukhothai as a tourism-supporting centre for the local alternative, and (ii) incremental (both construction and operating) cost of infrastructure required by each alternative in 2011. Operating cost takes into account both existing and newly constructed infrastructure with regard to the real use of each alternative, while it is only construction cost from the newly constructed infrastructure which is counted (since construction cost of the existing system is considered to be just a sunk cost). Finally, the present value of total cost at the end of 2011 with discount rate of 12 per cent [9] is calculated and then used in the cost-effectiveness analysis to compare level of efficiency per unit cost between the two alternatives under certain conditions. The required additional infrastructure and cost estimation of the technical infrastructure here takes into account only water supply, wastewater treatment, solid waste disposal, and telecommunication (in this case this refers to telephone only).

Since main differences of the infrastructure investment and relevant costs which would be created with regard to each development alternative would mostly occur in the urban area (or the so-called municipal area in this case) around the investment location and the effect would be proportionate to total cost of if the whole province is

Table 6 Estimated Costs of Required Additional Public-Related Tourism Infrastructure [10]

		Phitsanulok		Sukhothai			
				Sukhothai City		Sawankalok City	
		Excessive demand (person)	Total incremental cost (million Baht) [11]	Excessive demand (person)	Total incremental cost (million Baht)	Excessive demand (person)	Total incremental cost (million Baht)
Regional Alternative	Water supply	64,716	1,199.87	-46,372	120.13	814	121.35
	Wastewater	41,938	570.23	-19,919	69.73	-12,893	69.03
	Solid waste	-54,557	108.57	-17,919	12.93	-2,158	12.79
	Telephone	340,838	87.94	-449,960	0.14	-449,960	0.14
	Train	0	0.00	0	0.00	0	0.00
	Hospital	394,307	1,441.90	227,676	832.83	227,676	832.83
	School	136,463	2,742.41	21,537	432.87	21,537	432.87
	Total cost		6,150.92		1,468.63		1,469.00
	Additional beneficiary	978,261		249,214		250,028	
Local Alternative	Water supply	59,521	1,156.28	-45,446	125.17	1,731	129.16
	Wastewater	36,743	552.15	-18,993	72.43	-11,976	71.71
	Solid waste	-59,752	105.53	-16,993	13.47	-1,241	13.32
	Telephone	304,323	78.54	-423,797	0.15	-423,797	0.15
	Train	0	0.00	207 tourists per day	0.00	207 tourists per day	16.64
	Hospital	357,793	1,308.43	253,839	928.46	253,839	928.46
	School	127,453	2,561.36	28,227	567.31	28,227	567.31
	Total cost		5,762.29		1,707.00		1,726.75
	Additional beneficiary	885,834		282,066		283,797	

Table 7 Estimated Costs of Required Additional Public-Related Tourism Infrastructure Regarding the Projected Population of Scenario 2

		Phitsanulok		Sukhothai			
				Sukhothai City		Sawankalok City	
		Excessive demand (person)	Total incremental cost (million Baht)	Excessive demand (person)	Total incremental cost (million Baht)	Excessive demand (person)	Total incremental cost (million Baht)
Regional Alternative	Water supply	55,905	1,125.93	-45,584	124.42	1,595	127.99
	Wastewater	33,127	539.57	-19,131	72.03	-12,112	71.31
	Solid waste	-63,368	103.41	-17,131	13.39	-1,377	13.24
	Telephone	278,907	72.00	-427,690	0.15	-427,690	0.15
	Train	0	0.00	0	0.00	0	0.00
	Hospital	332,376	1,215.53	249,946	914.23	249,946	914.23
	School	124,344	2,498.88	13,199	265.31	13,199	265.31
	Total cost		5,555.31		1,389.53		1,392.24
	Additional beneficiary	824,659		263,146		264,740	
Local Alternative	Water supply	57,841	1,142.17	-45,466	125.06	1,711	128.98
	Wastewater	35,063	546.30	-19,013	72.37	-11,996	71.65
	Solid waste	-61,432	104.54	-17,013	13.46	-1,261	13.31
	Telephone	292,512	75.50	-424,375	0.15	-424,375	0.15
	Train	0	0.00	207 tourists per day	0.00	207 tourists per day	16.64
	Hospital	345,982	1,265.26	253,261	926.35	253,261	926.35
	School	116,053	2,332.26	19,106	384.00	19,106	384.00
	Total cost		5,466.04		1,521.39		1,541.08
	Additional beneficiary	847,450		272,574		274,284	

considered, only the required additional infrastructure to serve people living in the municipal area around the investment location is, therefore, chosen to be investigated in this study with an assumption that it would sufficiently represent the relative cost between each location. However, information of telecommunication provided at the municipal level is not available, estimation of the requirement through the whole province is applied instead for this particular aspect.

The estimation starts by comparing the estimated population in 2011 in each province of each alternative with the estimated number of consumer at full operating capacity of each type of infrastructure whether it would be sufficient or not, if not then how much does it need to be additionally provided with respect to the present average consumption per person.

To estimate the cost, unit cost of investment of each type of infrastructure derived from information provided in a German-Chinese co-operative research project is employed with an assumption that the labour intensity as well as the production cost of all kinds of public-related tourism infrastructure being considered in the study in China is similar to those in Thailand. Operating costs are calculated based on the information derived from the feasibility studies of several infrastructure investment projects in Thailand with an assumption that unit cost of all production factors are similar in all locations [12]. The result is presented in Table 6, while the result with regard to the projected number of population applied to scenario 2 is illustrated in Table 7.

2) Private-Related Tourism Infrastructure

Due to the time constraint, estimation of all private-related tourism infrastructure; e.g. accommodations, restaurants, travel and tour services, and recreation and entertainment facilities; would not be possible, only costs of constructing and operating the accommodation establishment in the two alternatives (at the three locations) are to be compared. Construction cost consists of the cost of land, construction materials and equipments, and labour. Operating cost comprises of (i) utility cost (e.g. cost of water supply, telecommunication, electricity, and waste disposal), (ii) labour cost, and (iii) other variable costs depending on number of guess arrivals. The time horizon of estimation is laid down to be ten years with the same occupancy rate of 60 per cent for all locations.

The unit cost of construction materials and equipments as well as the utility cost are assumed to be similar in all locations [13], while the multiplier of the labour cost in Sukhothai to Phitsanulok [14] is 0.78. Since only data on construction and operating costs of the hotel in Phitsanulok City is available (from interview), those of Sukhothai City and Sawankalok City are estimated based on the multiplier (cost ratio) of each factor as shown in Table 2.5. All costs are assumed to be similar in Sukhothai City and Sawankalok City except the land cost. Relevant costs of the 250-bed of group 2 hotel with 60 per cent occupancy rate [15] are chosen to represent the cost of investment in each location. The result is shown in Table 8.

From Table 8, it shows that the rate of return on capital of investment in Sukhothai City and Sawankalok City are only marginally different, while they are largely different to if the investment takes place in Phitsanulok City. This is mainly due to the higher labour cost and the lower revenue per room in Phitsanulok [18]. Nevertheless, it must be noted that this calculation does not take into account some other costs, benefits, and constraints; e.g. benefits from agglomeration economy in Phitsanulok, and higher transaction cost in Sukhothai [19], which makes Phitsanulok presently more attractive to the private investor.

Table 8 Relevant Costs and Revenue of Accommodation Establishment

	Phitsanulok	Sukhothai	Sawankalok	Cost ratio
Construction cost (Baht/room)	**600,000**	**550,325**	**534,075**	**1:0.92:0.89**
Land cost	65,000	40,625	24,375	1:0.625:0.375
Materials and equipments	420,000	420,000	420,000	1:1:1
Labour cost	115,000	89,700	89,700	1:0.78:0.78
Operating cost (Baht/month)	**3,331,000**	**3,045,000**	**3,045,000**	**1:0.91:0.91**
Utility cost	2,031,000	2,031,000	2,031,000	1:1:1
Labour cost and other variable costs [16]	1,300,000	1,014,000	1,014,000	1:0.78:0.78
Total cost (Baht/night) [17]	**152,129**	**139,193**	**138,080**	**1:0.92:0.91**
Average revenue (Baht/night)	**195,000**	**292,500**	**292,500**	**1:1.50:1.50**
Return on capital (without discounting)	**1.28**	**2.10**	**2.12**	

Nevertheless, considered the future situation in case investment is encouraged in Sukhothai, more accommodations would create a higher competitive environment, and as a result, the price per room being charged would drop. With an assumption that the price under competitive environment in Sukhothai will be equal to the price charged in Phitsanulok plus transportation and time cost of 15 per cent, the result would still be that investment in Sukhothai is preferable in terms of return on capital with the ratio of 1:1.09:1.10 without taking into consideration benefits from agglomeration economy and the transaction cost. This means if those two disadvantages are solved, Sukhothai would be a preferable investment location in any case.

3. Evaluation Model of the Development Alternatives

3.1 Summary of Development Objectives

The main idea of development objectives with respect to the Ninth NESDP could be summarized as "Instead of focusing only on economic prosperity, the new plan redirected to strengthening strong social foundation and prosperity decentralization as well as poverty alleviation and income generation", which is interpreted and summarized into following tasks:

- "To focus on sufficiency economy and people centre approach;
- To aim at tackling the poverty, the underprivileged of the people;
- To promote the fair distribution of income and the well-being of the people;
- To promote the balanced and sustainable development on the basis of self-reliance with regard to production process, resource utilization and environmental impact;
- To delegate roles, mission and cooperation which may contribute to the efficient resource utilization among public, private, and people sectors; and
- To focus on the effective and efficient work plan and procedures with regard to the economical and maximum resource utilization."

This means a development should not be focused on only the basis of economic efficiency as it had been implemented in Thailand since long ago, but rather on a fair distribution of income

and the well-being of the people as a whole. Final measure of success is rather the state of the people than the economic growth. The main criteria of this evaluation are defined as; (i) an overall economic efficiency, and (ii) a fair distribution; or so-called here as 'National Effect' and 'Regional Effect' accordingly with a higher priority being assigned to the latter. Weight is given to each indicator with respect to its priority implicitly indicates in the development plan.

3.2 Fundamental Assumptions

The performance values of all indicators are estimated on the basis of the following conditions:

- Many factors are assumed to remain unchanged from the base year. This includes tourist behaviours and characteristics in 2001, the consumption expenditure pattern in 1999 both at the national and provincial level, and the labour productivity in 1999 at constant 2001 price at both national and provincial level;
- Most prices being used in the impact estimation are relative prices at the constant 2001 price, since most available data are in that year (otherwise, the based year is to be mentioned);
- To value performance of each indicator, it is mainly based on the gross production value generated by tourists, and by that then to be translated to an employment and other effects;
- Production functions are assumed to be linear (no scale economies or diseconomies), that all firms in an industry employ a common production function, and that household consumption is a simple function of labour income;
- The value of the national import and export of each economic sector is assumed to be evenly distributed to all provinces of the country by the same share out of total gross production value of the province; and
- Multipliers per Baht spent to accommodation establishments are defined and shown in Table 9.

3.3 Criteria and Indicators

Criteria are defined and categorized into two main groups, i.e. that to measure an overall efficiency of the development alternative at the national level (so-called 'National Effect') and another to measure a fair distribution of benefits generated by the development alternative at the provincial level (so-called 'Regional Effect').

There are actually more than just an additional income generated by tourists to be taken into consideration as the national effect, e.g. an additional employment and revenues to the government [20]. However, to the government all those factors would results in the same way. The additional GDP generated by tourists as a representative of income effect is, therefore, chosen as a sole indicator to simplify the process and to

Table 9 Remaining Income (in the local) Multiplier per Baht spent to accommodation establishments

	Thailand	Phitsanulok	Sukhothai
Direct and indirect income multiplier of foreign tourist spending	11.18	7.69	7.76
Direct and indirect income multiplier of domestic tourist spending	25.87	18.72	18.80
Induce income multiplier of household spending	3.50	1.87	1.96

avoid a problem of double counting. Nevertheless, the weight given to the national effects represents a high priority of this effect because it implies not only improvement of income alone, but also other subsequent effects such as an employment effect and revenues to the government.

The regional effect is categorized into two groups as direct effect and indirect effect. Direct effect consists of effects directly generated by the alternative to the province in 2011, while indirect effect refers to long-term consequences created by the development alternative.

Weights are relatively assigned with regard to the development objectives. The regional effect gets higher weight due to implications from the statement "Instead of focusing only on economic prosperity, the new plan redirected to strengthening strong social foundation and prosperity decentralization as well as poverty alleviation and income generation" and "...economic improvement is treated only as a means to improve the well-being of the people rather than as the final objective of development [21]."

Direct effect and indirect effect are considered to be of equal significance for the development as an improvement of living standard of people in the short-term and the long-term respectively. Equal weight is, therefore, assigned to them. Among indicators of the direct effect, the relatively lowest weight is assigned for revenues to the local government, since it is only indirect benefit which do not guarantee if it would be properly allocated to the local people (as a redistribution process by the government), while the rest are direct benefit to the people. The highest weight is assigned to an employment effect since it is a fundamental factor for access to other sources which generate the well-being condition. However, it is considerable difficult for assigning appropriate weights to each indicator without an expert. A sensitivity analysis is to be employed to help to understand consequences from different weights.

Explanation of indicators, how to derive its performance value, and how to convert them to a utility value is illustrated in section 3.2.3. Effects which are difficult (or somewhat not possible) to be numerically valued; for instance, sectoral structure change, preference from a local people's point of view; are to be verbally referred to in an overall judgement.

3.4 Description of Indicators

To compare and evaluate impacts of the two alternatives, performance values of all indicators are transformed to dimensionless utility value by taking percentage change of the effect which would be generated in 2011 relative to the effect generated by the existing situation (in 2001) [22]. The bigger the aggregated utility value, the better the contribution of the alternative to the society is. Explanation of all indicators and how they are measured are described as follows:

***a) Income generated for the country*:**

This indicator takes into account not only direct and indirect income but also induced income generated by different alternatives which remains in the country. To simplify the process,

Table 10 Evaluation criteria with relative weights

National Effect	**35%**			Income generated for the country	
Regional Effect	**65%**	**Direct Effect**	**50%**	Income distributed to local people	30%
				Employment generated for the province	35%
				Beneficiaries of infrastructure provision	20%
				Revenues to the local government	15%
		Indirect Effect	**50%**	Improvement of location attractiveness	50%
				Migration effects	50%

GDP is used instead of income with an assumption that income is proportionate to GDP. Since the tourist and household's consumption expenditure pattern of each location are unlike, GDP being generated to the country by the two alternatives would be different. The criterion is measured by percentage change of GDP at constant 2001 price which would be generated by tourists in 2011 of each alternative to GDP generated by tourists in 2001. Income multipliers applied in this case are shown in Table 9.

***b) Income distributed to local people*:**

This indicator is a measurement of distribution of benefit in terms of remaining income in the local community. GPP is used to represent income being generated with the same assumption of using GDP as mentioned earlier. Multiplier to estimate remaining income within the local community is estimated including potential induced effects created. The figure may not, however, truly represent the real benefits to the local population since there are some businesses that owned by non-residents. Yet, since detailed data of share of business owned by non-residents is not available at the moment, the result derived is to be aware that part of income being generated would benefit to non-residents. The higher centrality the region, the more the benefit tends to go to non-residents (usually a higher centrality place has higher share of non-residents due to its high attractiveness).

Furthermore, due to; (i) same amount of money being valued differently by the poor and the rich (usually it is relatively higher valued by the poor), and (ii) the development objective which aims to alleviate poverty and to distribute a well-being condition through the whole society; different weights are given to the same amount of income generated in different regions depending on the current poverty situation of the region. The weight is higher assigned to where the share of people living under the poverty line is higher.

The poverty line is defined as a set of income cut-offs below which people may be said to live in straitened circumstances (Ross: online). The threshold is developed with an assumption that families that spent more than 70 per cent of their income on essentials [23] would have little or no income left to spend on transportation, health, personal care, education, household operation, recreation or insurance. Average household spending in the region is defined as essential spending [24]. Then low cut-off income per household is defined according to the assumption mentioned earlier (since the household size of all economic groups in both provinces are not significantly different that is approximately 3.6-3.9), it is assumed that required minimum income per household would be similar for all groups of people being considered in the study). Percentage share of household living under the poverty line out of total number of household from the two provinces are to be compared [25]. The weight representing the share of people living under the poverty line of each province is then derived. The result is that Phitsanulok has a higher share of people living under the poverty line even an average per capita income in Phitsanulok is higher than that in Sukhothai. This is due to (i) higher cost of living in Phitsanulok, and (ii) as mentioned earlier that poverty has a relative definition rather than an absolute one, as a result Phitsanulok - high order service area where better-off people are living - has higher share of people living under the relative poverty line.

***c) Employment generated for the province*:**

Apart from distributive effects measured in monetary terms as income distributed to the local people, the employment effect is another aspect to be considered as a fundamental factor for access to other sources of well-being generation. The employment effect of the region generated by the alternative may be different from the income effect due to the different labour productivity of each province. It is to say in another way that though equal income is generated in each of the two provinces, there could be less employment being generated in one province if the labour productivity of the province is higher than that of another province (probable due to the low labour intensive accompanied with high technology production process or a higher skill of labour). The effect is measured by percentage of the additional employment generated by tourists in 2011 relative to total employment generated by tourists in 2001 based on the labour productivity of the province in 1999 at constant 2001 price. Similar to the income effect, different weight is assigned to the same effect of employment generated in each province depending on level of the unemployment rate of the region. As a result, higher weight is given to Sukhothai where the unemployment rate is higher (assigned weight is Phitsanulok: Sukhothai = 0.41:0.59).

***d) Beneficiaries of infrastructure provision*:**

Since improvement of infrastructure leads to increase in living standards of people, this is considered to be another main indicator of evaluating the distribution of benefits generated by the development proposal as well. The measurement of this indicator is percentage share of total number of people potentially benefiting from the additional infrastructure provided in the region relative to total people benefiting from the existing infrastructure under the full-capacity operation circumstance. Equal weights are assigned to all types of infrastructure as well as to beneficiaries of both locations with an assumption that all types of infrastructure being considered in the study are mainly to serve basic needs of people and they are all equally important.

***e) Revenues to the local government*:**

Though budget allocated to the local government comes from many sources, only two sources; (i) value added tax [26], and (ii) general subsidy derived from the national government; are to be taken into consideration. Though value added tax is taken by certain percentage from value addition generated by the business either it belongs to non-residents or to local residents of the region (which then means just a transfer of benefit from one to another), it is to be considered here since it is a source of providing a fair distribution to all groups of people by a redistribution processes of the government to reallocate benefits through the whole society.

The amount of the general subsidy is allocated to the region according to several criteria. Since the criteria of allocating subsidy have not been clearly defined, only a criterion regarding number of population (fixed amount of subsidy as Baht per capita) [27] is taken into account [28]. Weight is given differently to improvement of subsidy allocated to each province based on the priority set by the government being applied in 2002 measured as the ratio of budget per capita allocated to the province. The ratio is 0.46:0.54 for Phitsanulok:Sukhothai which represents the government's preference to a support for more development in Sukhothai.

***f) Improvement of location attractiveness*:**

This indicator represents a potential of the future development of the region in the long run comparing to that of the country. It is used to measure improvement of location attractiveness during the period of 1999-2011 to that of 1993-1999. Equal weights are assigned to an improvement of any location.

***g) Migration effects*:**

Based on an assumption that both in and out migration would lead to costs to the society; particularly social costs such as cost of living away from family (which is difficult to be numerically valued), or economic costs such as operating cost of city which would grow beyond the economies of scale from the high level of in-migration; effects in both provinces are treated equally (by assigning equal weight to effect being generated in any locations). Projected number of population in 2011 according to number of job available in each region of each alternative is identified [29]. Number of migrants is measured as percentage change relative to the projected number of population in 2011 according to the average annual growth rate during 1990-2001 of each province.

3.5 Evaluation of the Alternatives

3.5.1 Scenario 1

Scenario 1 is a basic evaluation model based on basic assumptions as previously mentioned in section 3.2. The result is that it is preferable to follow the local alternative not only concerning the efficiency per unit cost, but also concerning solely the aggregated utility value or the total cost of infrastructure provision. Main differences between effects generated by the regional alternative and the local alternative are (i) the overall efficiency at the national level which is much better in the regional alternative, and (ii) the employment effect for the local community which is much better in the local alternative. The utility values of all indicators and the overall result are presented in Table 11.

3.5.2 Scenario 2

The purpose of scenario 2 is to analyse the sensitivity of the assumption of the constant participation and unemployment rate by employing different rates derived from the following assumptions as follows [30]:

- The additional labour supply generated by the economic growth should have priority in satisfying the labour force of the region with respect to the current unemployment rate. The labour surplus (if any) would then be taken up by migrants out of the study area; and
- In case of labour surplus would exist, only 50 percent of the labour surplus is assumed to migrate out from the region due to the reason of the cost of migration, and only 30 per cent of the migrants would migrate together with all family members, otherwise they would just migrate alone.

Table 11 Result of Scenario 1 Evaluation

Regional Alternative	
Aggregated utility value	41.21
Investment cost of infrastructure (million Baht)	7,005.03
Benefit of the project per thousand Baht of investment	5.88
Local Alternative	
Aggregated utility value	42.19
Investment cost of infrastructure (million Baht)	6,866.75
Benefit of the project per thousand Baht of investment	6.14

Following those assumptions, the participation rate and the unemployment rate employed to each alternative of scenario 2 are as shown in Table 12 and the result of the evaluation model of scenario 2 is illustrated in Table 13.

In general, concerning the utility value, there is almost no difference between scenario 1 and 2. The main difference is the cost of infrastructure provision, which is just slightly higher in the local alternative. This means the assumption on the participation rate and the unemployment rate plays somewhat a significant role to the evaluation model. However, concerning the overall performance measured as efficiency per unit cost, the local alternative is still considered to be preferable.

3.5.3 Scenario 3

Scenario 3 is an evaluation model based on all similar assumptions as those employed to scenario 1 except weights being assigned to each indicator. Weights are equally assigned to the main criteria, sub-criteria, and indicators to test whether the result is sensitive to the different weighting. This equal weighting model gives a significantly different result to that derived from scenario 1. It results that the regional alternative would be preferable in this case both in terms of its performance measured as the aggregated utility value and as efficiency per unit cost. The main reason is that the equally weighting largely increase benefit from the national effect to the regional alternative. This means political priority would largely play an important role for the decision-making.

3.5.4 Scenario 4

The only difference between conditions employed to scenario 1 and 4 is the location of investment in Sukhothai. Instead of locating it in Sukhothai City, scenario 4 assumes that investment will take place in Sawankalok City. The result derived under scenario 4 conditions is

Table 12 Participation Rate and Unemployment Rate Employed to Scenario 2

	Regional Alternative		Local Alternative	
	Phitsanulok	**Sukhothai**	**Phitsanulok**	**Sukhothai**
Participation rate (%)	50.15	47.14	48.22	48.87
Unemployment rate (%)	3.76	8.08	3.76	6.35

Table 13 Result of Scenario 2 Evaluation

Regional Alternative	
Aggregated utility value	41.82
Investment cost of infrastructure (million Baht)	6,394.72
Benefit of the project per thousand Baht of investment	6.54
Local Alternative	
Aggregated utility value	42.67
Investment cost of infrastructure (million Baht)	6,434.68
Benefit of the project per thousand Baht of investment	6.63

just marginally different from that derived from scenario 1. The cost of infrastructure provision would be slightly lower if the investment takes place in Sukhothai City both for the regional alternative and the local alternative (it would affect more to the local alternative). In general, it could be concluded that location would not largely affect the evaluation result concerning numerical assessment as shown in Table 15.

3.6 Summary of the Evaluation

In order to analyse in detail advantages and disadvantages connected to each alternative as well as to figure out to which assumption the results derived from the evaluation model is sensitive to, evaluation results regarding each aspect; i.e. overall benefit to the society regarding development objectives, cost to the national government, and efficiency per unit cost; are considered separately. In general, the result shows that the local alternative is likely to be preferable but largely sensitive to some assumptions being applied. Results of each aspect are summarized as follows.

3.6.1 Overall Benefit to the Society Regarding Development Objectives

The overall benefit to the society regarding development objectives is evaluated according to dimensionless utility values assigned with objective-specific weighting of the four scenarios. The results provide understanding to the national government on advantages and disadvantages connected to each scenario under different conditions. Aggregated utility value gives an image of comprehensive benefit when compared with the two alternatives under the scenario conditions.

Considered distributive effect (or here the so-called regional effect), the local alternative would likely be a greater benefit (or in other words less cost) to the local communities regarding more or less all aspects under any conditions [31], particularly concerning contribution that would affect employment. Main reasons for being preferable, in terms of fair distribution of the local alternative, are (i) lower marginal propensity to import in Sukhothai would result in more income generated to remain

Table 14 Result of Scenario 3 Evaluation

Regional Alternative	
Aggregated utility value	42.88
Investment cost of infrastructure (million Baht)	7,005.03
Benefit of the project per thousand Baht of investment	6.12
Local Alternative	
Aggregated utility value	39.46
Investment cost of infrastructure (million Baht)	6,866.75
Benefit of the project per thousand Baht of investment	5.75

Table 15 Result of Scenario 4 Evaluation

Regional Alternative	
Aggregated utility value	41.22
Investment cost of infrastructure (million Baht)	7,005.13
Benefit of the project per thousand Baht of investment	5.88
Local Alternative	
Aggregated utility value	42.20
Investment cost of infrastructure (million Baht)	6,885.93
Benefit of the project per thousand Baht of investment	6.15

in the region, (ii) lower labour productivity in Sukhothai would result in more employment generated to the region with respect to the same production value, (iii) in accordance with higher unemployment rate in Sukhothai, higher benefit is considered for employment generated in Sukhothai than if the same is generated in Phitsanulok, and (iv) providing more job opportunities in Sukhothai (or less job in Phitsanulok) would lead to less out-migration from Sukhothai and less in-migration to Phitsanulok as well.

In addition, when considering the national effect (measured by income generated for the country), the regional alternative would likely contribute a higher benefit to the society as a whole. The main reason for the local alternative to be less efficient (shown as lower utility value of the national effect) is that the consumption expenditure of tourists in Sukhothai is lower than that in Phitsanulok. It is because of (i) less tourism activities and supporting facilities in Sukhothai (which implies less opportunity for tourist to spend money), (ii) isolated location of existing hotels which creates difficulty for tourists to go outside and spend money once they arrive at the hotel, and (iii) lower living expenses in Sukhothai.

When considering the aggregated utility value that of the four scenarios, they are just marginally different. The local alternative contributes higher benefit to the society as a whole in most cases. Nevertheless, scenario 3 gives the opposite result to that of the other three, and this is mainly due to the relatively higher weight being assigned to the national effect. It implies that the higher the priority given to the national effect (efficiency development approach), the less preferable local alternative will be where the national government's point of view concerned.

3.6.2 Cost to the National Government

Based on a basic assumption that the participation rate and the unemployment rate will remain unchanged within the employed time horizon, the present cost value of infrastructure provision of the regional alternative would be higher than that of the local alternative either the investment of accommodation supporting tourism taking place in Sukhothai City or in Sawankalok City [32].

However, by using a different participation rate and unemployment rate the result would significantly differ from the preference of the government regarding cost of infrastructure provision. Based on an assumption being used in scenario 2, the regional alternative would consist of a lower cost of infrastructure provision than the cost of the local alternative, mainly due to less migration to Phitsanulok. It could be concluded that the less migration effect, the lower the cost of infrastructure provision for the regional alternative is. In addition, the results show that it is not significantly different concerning the monetary cost to the national government should the investment take place in Sukhothai City or in Sawankalok City.

3.6.3 Efficiency per Unit Cost

This is to measure the efficiency of the development alternatives as a benefit to society as a whole with respect to the political priorities per unit cost to the government (costs regarding private investment is not taken into consideration here). In this respect, the local alternative would be preferable in any case, except if the efficiency development approach is the main focus. That means the regional alternative would be preferable under the condition of equal weight being assigned to the national effect and regional effect. Nevertheless, one must be aware that the

result is considerably sensitive to at least two main factors, i.e. participation and unemployment rate, and political priority concerning the development approach (e.g. to focus on the efficiency development approach or the fair distribution development approach).

4. Conclusions and Recommendations

4.1 Overall Judgement

According to the result derived from the evaluation model connected with the different conditions as previously described, it shows that political prioritisation of the development objective plays a significant role in the evaluation model. This means in order to decide on which development alternative is preferable it would depend largely on the political interest with regard to the development objective.

Though it is clearly stated in the development plans that decentralized development and a fair distribution of income and the well-being of the people is a priority of the government, development is still restricted to the regional level only, and not to the local level. Presently, development is focused not only focused on few cities such as Bangkok and Chiang Mai as was the case during the last decades, but also in the provinces that have been recently set to be regional centres including Phitsanulok - a centre of the lower northern region. This approach helps somewhat to reduce problems in the existing large cities, but instead of solving the problem from the route, this is just a matter of spreading problems through other newly promoted cities (regional centre), while problems in peripheral or less developed provinces would continue existing.

In the past, the Thai government had introduced the national economic and social development concept largely based on the acceleration of economic growth, and had been successful in that. Yet, successes in economic growth and material progress to date have not meant that all Thai people are enjoying greater wealth and a substantially improved quality of life. Since the function of the government is not only to improve economic efficiency, but also to make the distribution of income less unequal, from a planner's point of view, the fair distribution development approach is therefore considered to be a priority for Thai society at the moment.

Based on the fair distribution approach, the local alternative would be preferable in any case though the numerical results measured as efficiency per unit cost of the regional alternative and the local alternative are just marginally different and rather variable to some assumptions. This is due to some other supporting reasons that were not mentioned in the evaluation model, since they are considerably difficult to be numerically valued. A rough estimation of number of population and number of workplace in Sukhothai in 2011 shows that Sukhothai will in any case face a high level of out-migration due to a lack of job opportunities like many other less developed provinces. This is a consequence of a development approach where economic efficiency is the sole factor to be considered, and then followed by cumulative processes making developed regions more attractive while making peripheral regions attractive over time.

To reduce the negative consequences (either of being too highly concentrated or left-behind provinces) due to migration, the primary

cause of the problem must be solved that is more job opportunities consistent with the economic potentials, preferences, and functions of the area should be provided to peripheral regions. Tourism is considered to be one of the sectors with most potential for promoting development in Sukhothai. This would then be a good and suitable initiative with regard to its economic potential for generating cumulative process and encouraging further development in Sukhothai. Though shifting part of the tourism function from Phitsanulok - where several main economic activities are concentrated - would affect economic growth in Phitsanulok to some extent, it is not considered to be more than the value of benefits that would potentially be contributed to Sukhothai in the long run.

In addition, with respect to existing infrastructure provision, the local alternative is preferable concerning supporting tourism development in the future, since it does not sound so reasonable to construct additional infrastructure in Phitsanulok and leave existing infrastructure in Sukhothai to be increasingly over supplied over time (due to out-migration).

Considered from the point of view of private investor of accommodation establishments, investment in Sukhothai seems to give a higher rate of return on capital. Indeed, accommodation establishments still considerably concentrate in Phitsanulok due to (i) complicated and strict regulations of building permission in the areas controlled by either Sukhothai Municipality or Muang Kao District Municipality, and (ii) less risk of suffering the losses in Phitsanulok since there are a number of other potential clients; e.g. clients with business purposes; apart from tourists with a travelling purpose (which is rather sensitive to several external factors, particularly for historical tourism which relies largely on foreign tourists and therefore faces considerable uncertainty through the year).

Nonetheless, local preference is considerable important for any development planning decision. By casually interviewing to local people who are not involved in doing business in Sukhothai, they are satisfied of the city as being presently quiet and peaceful, but also do not object if the future development of the tourism sector should take place there. It is however only the attitude of a few samples, a formal survey should then be undertaken before any decision is to be made to ensure that development would be consistent with the local preference.

Concerning location of investment in Sukhothai, Sukhothai City is a more preferable location than Sawankalok City if one only takes into consideration the numerical results derived from the evaluation model as shown in the previous part, but the results are just marginally different. However, the evaluation according to the administrative boundary (entity of the province) would not truly represent the real effects of investment. The evaluation according to the hinterland of development poles is to be analysed here in detail. This is evaluated mainly on the basis of the Sukhothai Five-Year Development Plan (2002-2006) which aims to promote local employment and reduce labour out-migration.

If investment is promoted in Sukhothai City, there will still be alarge area which would not be covered by the area benefiting from the development. These means people in those areas would not receive any benefit from the investment promotion and development, and would still probably be unemployed or have to migrate out. The impact of investment taking place in Sawankalok City seems to be rather better. The

area benefiting from potential investment in Sawankalok City seems to cover a broader area of the province than if the investment is promoted in Sukhothai City. It means that most people would easily be able to commute daily to work, and consequently this would contribute a better result in terms of the migration effect (it is relatively the worst concerning this aspect if investment takes place in Phitsanulok as found in the regional alternative condition).

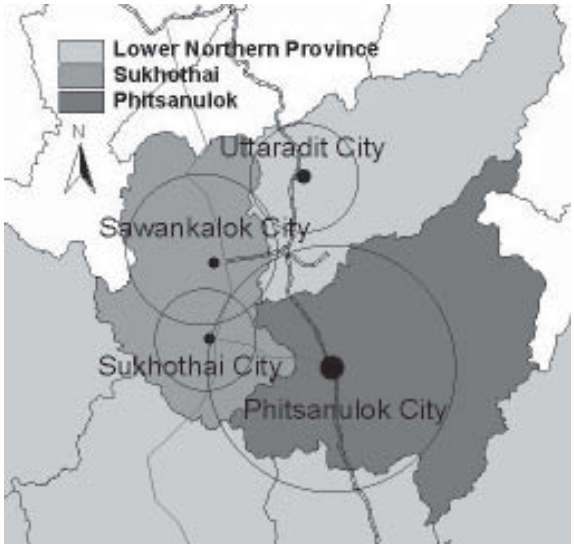
Furthermore, Sawankalok City has better access to both rail and air transportation that would better enhance tourism development in Sukhothai. However, a good local and short-distance transport system connecting Sawankalok with the historical parks, Phitsanulok, and within the urban area itself should be provided in order to increase the potential use of those infrastructures. The existing accommodations in Sukhothai City would then be considered as another option for tourists who prefer to stay near to Sukhothai Historical Park (long stay tourist).

4.2 Recommendations

As regard the preferred option, suggested measures to improve disadvantages of development of the local alternative which is to be followed by government are to be investigated. Aforementioned, the local alternative comprises two main disadvantages from the government's point of view; (i) ineffective institutional structure and insufficient coordination among institutions, and (ii) management and capacity building of government staff at the local level; and three main disadvantages from the private sector's point of view; (i) discouragement of potential investment in Sukhothai because of the difficulty of dealing with some government agencies, regulations, inadequate infrastructure, and insufficient investment incentives, (ii) high risk

Regional Alternative

Local Alternative_ Sukhothai City



Local Alternative_ Sawankalok City

Figure 3 Analysis of Development Poles and the Future Hinterland Development

due to the market being based solely on tourism, and (iii) insufficient tourism supporting facilities to attract tourists to spend money in the study area. The following are recommendations and suggested measures for improvement.

4.2.1 Recommendations Regarding Tourism Development in General

Due to some weaknesses regarding tourism-relevant institutional structures, the following factors are general recommendations for improving tourism development in Thailand and in order for the study area to reach a higher success level:

- The capability of administrative government at local level for planning and making action plans according to the economic potentials, preferences, and functions of the area should bestrengthened through human capacity-building programmes for locals or by enhancing coordination between experts from the national institutions and the local government.
- The aforementioned tourism is not being considered a priority area of BOI at the moment (perhaps due to lack of specialist), thus it is suggested that there should be an institutional adjustment probably by encouraging other governmental agencies in addition to BOI and TAT to become involved in tourism investment, or encouraging TAT itself (where tourism experts are concentrated) for this purpose either through increasing its authority for promoting or regulating tourism development in certain preference areas or by strengthening coordination between BOI and TAT to make regulations and incentives to be better suited for tourism development;
- Local communities should be encouraged to be more involved at all level in all aspects of the policy-making, planning, and management decision-making processes in order to make the plans best suit their context; and
- The idea (and indeed a current regulation) that historical sites should be managed by the Fine Arts Department should be changed and the creation of a sense of belonging to local people living around the historical site should be introduced instead, in order to ensure sustainable development of the area (so that people would care for the place more as it is their home and always maintain it as best as possible).

4.2.2 Recommendations to the Preferred Alternative

Aforementioned, the local alternative - which is to shift required additional accommodation establishments serving foreign tourists in Phitsanulok according to projection of tourism development trend to Sukhothai) - by promoting the future investment in Sawankalok City is preferable. It consists, however, of some disadvantages as pointed out earlier. Direct and indirect forms of government intervention are considered in this case to be necessary to ensure fair distribution of economic benefits from tourism development to all people in the society. Moreover, incentives should be properly allocated in order to encourage investment to take place in a preferred area. Suggested measures are described as follows:

a) Creation of a favourable context for investment with specific tourism-related incentives

By providing better conditions for tourism-related infrastructure

Part of this supporting measure was already considered in the evaluation model as costs of infrastructure provision for the local alternative. However, the measure does not include only providing more frequent train connection to Phitsanulok as it is considered in the model, but also to provide other types of infrastructure both physical infrastructure and institutional infrastructure, e.g. giving concessions to private investor for providing local transportation in the required areas, and providing training schools to upgrade labour to serve certain needs.

By improving the legislative framework

The main idea of this suggestion is to stimulate private investment (in this case with reference to accommodation facilities) to take place in Sukhothai through the creation of a special tourism investment promotion zone. This would not only reduce the cost to the private investor of connecting existing public infrastructure and the cost of some facilities, such as swimming pool, security control, etc. which they could share, but also the cost to the government of providing infrastructure if otherwise each hotel would spread to wherever the owner wishes. Suggested incentives to be applied to the promotion zone are:

- Alleviating complicated administrative processes and regulations (particularly for construction permission and land tenure regulations) or at least making them clearly understood;
- Support for infrastructure development, especially in key public sector areas such as water supply, electricity and telephone by providing a ready for operation and reliable system for the promotion area; and
- Initiation of fiscal incentives to make investment in tourism projects more attractive, less risk-prone, more capable of returning a profit and more sustainable; e.g. by providing tax holidays and deduction, custom duty exemptions, concessions or capital expenditure allowance. Presently, there are indeed existing fiscal incentives defined by BOI applied to EPZ for hotel business as well. However, the most important one, tax holidays or deduction, which would mostly attract investor is not included. This is of considerable importance for encouraging investment to take place, since it would help reduce the risk of loss in Sukhothai during first few years of operation until the more agglomeration economy begins to take place there.

The area of promotion must be, however, carefully chosen so that it would be attractive for investment, and at the same time consistent with the existing urban pattern and be suitable for future development as well.

b) Promoting policies to ensure allocation of benefits to the local community

The main ideas of this suggestion are to enhance management of tourism-related activities by local organizations and to reduce income leakages at the local level. Specific actions include:

- Providing education and training programmes that are necessary in order to ensure that local residents are in a position to obtain the necessary skills and knowledge for participating effectively in the labour market demand with

regard to additional employment and sectoral structure change (e.g. the labour demand of the service sector would increase and that means a probable shift of labour from the agriculture sector to the service sector). This would need skills-training as an additional requirement to complement the service sectors, and furthermore on skills-training to improve the labour productivity of the agriculture sector to maintain production supply demanded by the region);

- Training and the provision of financial as well as technical assistance that will support the creation of locally owned and operated small and medium-sized enterprises which would help to maintain incomes within the community;
- Ensuring that capacity-building initiatives are designed to develop trained local workers to assume both managerial as well as lower-level
  positions based on an idea that benefits should be distributed to all groups;
- Encouraging tourism development that makes use of local agriculture products and materials. This may require some investment, but the long-term benefits are that the local community will have the capacity to benefit directly from tourism development;
- Local governments may give preference to projects that employ local labour and help to build capacity of local people as it would develop the local labours in the long run;
- Creating taxes that stay within the local community to help to support infrastructure being provided by the government (e.g. required additional transportation, waste management, etc.) to make the development self-sustainable; and
- Capacity building of local government and organizations for making a specific development and action plans at the local level which is consistent with the economic potentials, preferences, and functions of the area, not just by following the regional development plan as it is presently done.

c) Other supporting measures Aforementioned, the main disadvantage of the development of the local alternative over the regional alternative is the efficiency effect at the national level mainly due to lower tourist consumption expenditure resulting from several reasons as mentioned earlier. Though it is mentioned earlier as well that the cumulative process would naturally solve this problem over time, but government can also accelerate the process by arranging activities or facilities such as mini light and sound event to improve the situation in the short-term.

In addition, since the domestic tourism market is considered to be more reliable and stable through the whole year, and less sensitive to external factors as compared with the foreign tourism market, the government could help to stabilize the business through the whole year by marketing promotion to encourage domestic tourists to stay more in Sukhothai especially during the low season for foreigner's tourists.

4.2.3 Final Remarks

There are some aspects which are not included in this study but is of considerable importance to the evaluation of development proposals, and as a result, is being recommended for further investigation. Remarks presented are as follows:

- Mostly important, it is to be aware of the extent to which the government should interfere in market forces that would still result in positive effects to the society as a whole;
- A rapid change in the sectoral structure (by economic sector) would lead to negative effects to the society due to, for instance, the labour structure not being properly prepared for it. The consequences which would be potentially generated from sectoral structure change by the development proposals should be, therefore, carefully taken into consideration;
- The study does not deal with the inflation of living expense in the region, resulting from different development proposals which would be dramatically increased in the area where tourism is promoted. Since this is a really complex issue and would be too detailed and complicated for the study, it is necessary to note that it would significantly affect the evaluation result;
- Effects to the local culture is another important and delicate aspect often connected with tourism development and would need a lot more time and speciality to analyse properly in detail;
- Local attitudes towards the development proposal should be surveyed before any decision is to be made to ensure part of the success of the development as mentioned earlier; and finally
- Since the study consists of a number of assumptions due to the limitation of time and available data at the time the study was being executed, the result provided in the study should be further analysed in more detail before being used as a reference.

References

[1] The historical town of Sukhothai (which will be called hereafter as Sukhothai Historical Park) and associated historical towns[1] were inscribed on the World Heritage List in 1991. It is one among the most favourite historical tourism destinations in Thailand for both foreign and domestic tourists. Sukhothai Historical Park is located in Sukhothai, a considerable remaining lagging province but has high potential for developing on the basis of tourism. Sukhothai is now largely dependent on Phitsanulok, a neighbouring province which has been developed as the regional centre of the lower northern region not only as a business centre but also as an education centre, a health centre as well as a tourism supporting centre due to its advantageous location.

[2] Due to the space limitation, this part as well as the tourism development trend projection is excluded from the content.

[3] Impacts of some criteria that could not be numerically valued (if exists) are to be explained verbally.

[4] Though the population density of Sukhothai seems to be just marginally lower than that of Phitsanulok, but due to the higher share of unregistered migrated population in Phitsanulok - a high centrality area which consequently leads to in-migration attractiveness - the population density of Phitsanulok is considered to be much higher than that of Sukhothai. The real population living in the municipal area of Amphoe Muang Phitsanulok estimated by GTZ according to the 'Study on the Feasibility of a Mechanical-biological Residual Waste Treatment Plant in Phitsanulok, Thailand' is approximately 130,000. This gives an estimation of 44 per cent of the share of unregistered migrated population to the total registered population, while that of Sukhothai is estimated to be approximately 17 per cent only.

[5] Figures shown in Table 3 are calculated based on an assumption that the percentage share of tourists by type of accommodation will remain unchanged thought it is in fact unrealistic. There is a study on the accommodation requirement in the lower north of Thailand which indicates that there is a requirement of additional upper-class hotels in Sukhothai and additional resorts both in Phitsanulok and Sukhothai. Due to a lack of numerical data to value such additional requirement, the assumption that the percentage share of tourists by type of accommodation will remain unchanged is applied.

[6] Due to the space limitation, detailed calculation could not be described in the content.

[7] The participation rate and the unemployment rate applied in this case is not the one shown in the statistical reports, but a further calculation which takes into account the unregistered population (estimated by GTZ in the feasibility study for solid waste project of both provinces) as well to make the figure more realistic. Nevertheless, the assumption that the population structure and the unemployment situation within the employed time horizon will remain unchanged is in fact unrealistic, because some people would not migrate and prefer to stay at home even they will be unemployed if the cost of migrating is higher than their acceptance (at least they will not have to pay for accommodation if they do not migrate. For instance, if more workplaces would be generated in Sukhothai by the local alternative than by alternative A, instead of more people would migrate out from Sukhothai, this would result in a lower unemployment rate in Sukhothai for the local alternative than that for the regional alternative.

In addition, if there is insufficient job opportunity, people would migrate to a place where there is a better opportunity but probably not with his/her family. This implies to a change of the participation rate (due to the population structure change). The main consideration for these assumptions is that

in reality there would not be that much out-migration from Sukhothai and in-migration to Phitsanulok as it is derived from the calculation process of the study and shown in Table 2.2. Sensitivity analysis (Scenario 2 which applies the different participation rate and unemployment rate to different alternatives) is, therefore, applied to test the robustness of the result.

[8] This would be true if there is no cost of migration, because otherwise some would prefer to be unemployed and do not migrate.

[9] Discount rate being mostly used for project evaluation in Thailand.

[10] Negative excessive demand value refers to number of additional people that could be served by the existing infrastructure (service surplus).

[11] The figures shown in the table do not take into account a discount rate, but total incremental cost of the infrastructure provision in each location being applied to CEA is discounted at the rate of 12 per cent.

[12] Due to time constraint of the study that makes detailed calculation with regard to different production function in each location to be neglected. Further detailed study is recommended before the result is used as reference.

[13] Actually, the utility cost could be differently charged depending on regulations of the local government, but most of them are presently charged at the same rate. Since detailed data are not available during the study period and it would not make any major difference to the cost comparison, the same consumption rate per room and unit price being charged is applied to all locations in the study. For price of materials and equipments, they are also assumed to be equal in all locations with an assumption that they would be transported from the same source with same distance which is actually unrealistic but would be just marginally different and consequently is ignored.

[14] It is calculated according to the labour productivity and the average monthly wage per worker surveyed by the National Statistical Office, not from a minimum wage per day regulated by laws, since the regulated minimum wage does not represent the real situation. This multiplier shows in order to get the same amount of production value how much do it has to be paid for the labour in Sukhothai in comparison to that in Phitsanulok. The ratio of the labour productivity of Phitsanulok: Sukhothai is 1:0.90, while it is 1:0.70 for the wage.

[15] Since the main purpose of this comparison is to get just a broad impression of differences of investment in each location, calculation for all types of accommodation would be much too detailed with regard to the time constraint of the study. Only one type of the accommodation establishments is, therefore, chosen to represent an overall image.

[16] Since data are available only as total cost of labour together with other variable cost on the cost ratio of the other variable costs in each location are not available, the cost ratio applied to both costs in this category is assumed to be the same as the cost ratio of labour cost.

[17] This means an average investment and operating cost for running the 250-bed hotel with 60 per cent average occupancy rate.

[18] This is because to stay in Phitsanulok comprises a higher transportation and time cost of commuting to the historical park than to stay in Sukhothai, tourists are therefore willing to pay higher rate for the room in Sukhothai. In addition, the existing supply is considerable insufficient to serve the demand, the hotel can therefore charge a higher price than it could be in a perfect competitive market.

[19] This is due to the stricter regulations of building permission in the area of the Sukhothai Municipality and the Mueng Kao District Municipality (where Sukhothai Historical Park is located covering approximately 70 km^2).

[20] Though it is just a transfer payment but it is considered as a fundamental means of redistribution of benefits, and as a result plays a role of evaluating development impacts also.

[21] National Economic and Social Development Board (2003). Nation Economic and Social Development Plan. Online. Internet. Available: http://www.nesdb.go.th/index.html

[22] In general, the method of identifying the worst and the best case additionally as a minimum and maximum threshold of the utility value is supposed to be employed if only two options are to be compared. However, identifying the worst and the best case measuring development level is considered to be far too difficult (or probably not possible) for the study, percentage change relative to the existing situation is then decided to be employed.

[23] The meaning of income here includes wages and salaries (before tax deductions), net income from self-employment, investment income, government transfer payments (such as unemployment insurance, social assistance, old age pensions, and refundable tax credits), training allowances and the like, private pensions, scholarships and alimony payments. The essentials include basic foods and drinks, cloths, accommodations, and basic health care.

[24] It is obvious that this figure would not truly represent spending on essentials, because it would be considerable too high in the place where better-off people are living. Since better data are not available during the study period, the figure is assumed to be representative.

[25] It is to address how many households living under the poverty line in the province if taken such 100 households from the two provinces into account.

[26] It is approximately 7 per cent of the value addition of the production. However, approximately 30 per cent is to be charged by the national government as a transaction cost of collecting this tax. Value addition is estimated as percentage share from total production value derived from Input-Output Table in 1998.

[27] In 2002, it was approximately 400 Baht per capita for the Phitsanulok Municipality, 600 Baht per capita for the Sukhothai Municipality and the Sawankalok Municipality, and 300 Baht for the population living in non-municipal areas.

[28] It is a main variable which would result differently to different development alternatives. While the other criteria which either would not make large difference to the analysis such as area of the region, or still being ambiguous such as level of income are not considered.

[29] For all scenarios excluding scenario 2, number of population is projected based on an assumption that the population structure and the employment structure in 2001 will remain constant within the employed time horizon, though it would not be the case in reality. As a result, the participation rate and the unemployment rate in 2001 is applied to the three scenarios. Different participation and unemployment rate, which would result in differences of the population and the labour force structure and consequently the number of migrants, are applied to the scenario 2.

[30] The numerical estimates were made on the basis of the author's experience of migration process in Thailand since detailed data were not available during the study period.

[31] Exceptions are applied to results in terms of (i) number of additional beneficiaries from the infrastructure provision, and (ii) migration effect for scenario 2. It is due to an assumption of different participation and unemployment rate being applied to scenario 1, 3, and 4 (but the difference is only marginal).

[32] Cost of infrastructure provision in case of investment taking place in Sukhothai City is just slightly lower (less than 1 per cent) than that of Sawankalok City.