

Impact of Community-based Tourism in a Village Economy in Thailand: An analysis with VCGE model

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Abstract

This study constructed a social accounting matrix (SAM) and a computable general equilibrium model (CGE) for a particular village for the first time in Thailand by a household census. The purpose was to investigate the direct and indirect effects of tourism price increase on income generation and income distribution in the village. For the income generation, the income multipliers varied from 1.55 -37.01. They depended heavily on the rate of tourism price increase and the rate of endowment expansion. The value-added multipliers were more stable which were clustered around 1.07 and 1.26. For the income distribution, the results supported the argument of uneven income distribution. The richest households gained the highest benefits in both terms of gross and real income. The poorest households gained the least and even experienced the drop of their real consumption. This was because the increasing consumer's price which would offset some benefits that they may gain indirectly via a hopeful but weak tourism-agricultural linkages. The study also found that souvenir production was the top gainer among production sectors. This would lead to the policy that souvenir production should be promoted together with community-based tourism for other villages across the country.

Keyword: Village Computable General Equilibrium Model, Social Accounting Matrix, Community-based Tourism, Impact of tourism, Household analysis

JEL classification: C68, O12, R20

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1. Introduction

Community-based tourism (CBT) is a hope to carry tourism benefits to the poor. CBT arose after the Earth Summit in 1992 at Rio de Janeiro¹ in accordance with the Agenda 21 (Phayakvichien, 2005). There are several definitions of CBT. The accordance among definitions given by World Bank (2000), UN-ESCAP (2001), REST (2003), and Ashley, Roe and Goodwin (2001) can be compiled as follow. Community-based Tourism is tourism that emphasized the ownership, management and involvement of communities' members in the tourism activities. CBT is not just an ecotourism. While ecotourism focuses on ecological friendliness, community-based tourism focuses on the participations of villagers in the tourism activities and the sharing of tourism benefits among villagers.

International organizations concerned CBT as a mean for development. The United Nations declared the year 2002 as the International Year of Ecotourism (UNEP, 2002). The World Bank arranged a work shop on CBT (World Bank, 2000). The United Nations carried out a study of the effect of CBT to poverty reduction (UNDESA, 1999). CBT was also included in national development strategies of several countries such as South Africa (Brennan and Allen, 2001) and Namibia (Ministry of Environment and Tourism of Namibia, 1995).

Community-based tourism in Thailand was heavily expanded during the Amazing Thailand years, 1998 -1999 (Homestay Thailand, 2007). Before that period, the tourism in rural villages can be dated back to 1960. It was limited to the provision of accommodations for trekkers, social activists and rural developers which was called "homestay". Extending from accommodations service, villagers offered ecotourism and soft adventures for visitors. Then CBT was gradually developed in villages along with the growing participations of village members. The expectation for CBT to the rural village economies encourages government agencies to get involved to the activity. Tourism Authority of Thailand (TAT)

¹ The United Nations Conference on Environment and Development (UNCED), Rio de Janeiro, 3 – 14 June 1992. The informal name was the Earth Summit. Number of participants at level of heads of state of government was 172,108. Number of representatives of NGOs was 2,400. The conference gave a result of Agenda 21, the Rio declaration on environment and development, the statement of forest principles, the United Nations framework convention on climate change and the United Nations convention on biological diversity. (UN, 1992)

started in 2007 to give the so called “The Most Outstanding Community-Based Tourism Award” to 62 villages out of 183 candidates (TAT, 2007).

While CBT is heavily promoted in Thailand, its viability and sustainability are dubious. There are two problems associated to CBT. The first problem is the low income generation. CBT takes time to deliver benefits to villagers. Therefore, in the beginning period, income generation is low (Lynn, 2003). It is also added by Strasdas (2005) that communities need at least 5 years before they generate substantial income for the villages. Although most of villages want CBT for additional income, they confronted with the opportunity cost obtained from agricultural productions Rozemeijer (2001). In this case, they might not be patient enough to wait for the growing stage of CBT.

The second problem is the uneven tourism income distribution. Tourism income distribution is more uneven than agricultural income (Kaosa-ard, 2006; Untong et al, 2006; Oula, 2006; Prachvuthy, 2006). Tourism activities were controlled by village’s leaders and the richest group of villagers who occupied more capitals. The situation violates the ideology of CBT which aims for the sharing benefits among villagers.

To address these two problems, there are rooms for a quantitative study to investigate the impact of CBT at the village level. The point is the underestimation of tourism income. Low income generation may be underestimated due to only direct effect was evaluated. Including the indirect effect may find more income generation for CBT to a village. Mitchell and Ashley (2007) argued that the indirect effect may share 50 – 90 percent of the impact of tourism. However, the study was still at the national level not at the village level.

The issue of income distribution was clearly revealed by the quantitative studies of Kaosa-ard, (2006), Untong et al, (2006), Oula, (2006) and Prachvuthy, (2006). However, only the income distribution within tourism sector, the direct effect, was investigated. The distribution of income from tourism sector to other sectors was not included. It is hypothesized by Untong et al (2006) that if the indirect effect was included, the tourism income distribution may be more even. This hypothesis was strongly supported by Mitchell and Ashley (2007) who emphasized the significance of the indirect income distribution because tourism requires a range of supply chains that can extend deep into the host economy.

With these rooms for the quantitative analysis, it is interesting to construct a CGE model at the village level, the VCGE model, to provide a concrete economic impact of community-based tourism to a village economy. The model will take into account both direct and indirect effect of income generation and income distribution.

2. Objective

To investigate the income generation and income distribution caused by community-based tourism in a village in Thailand by taking into account both direct and indirect effect.

3. Conceptual framework and literature review

Goals and practices of CBT regarding to income generation and income distribution are mismatched. Communities expect for high income generation but it is not an ultimate goal of CBT. Income distribution which is the goal was ignored and not achievable. The following section will discuss these topics. The section will begin with income generation. Then the issue of income distribution will be followed.

3.1) Income generation

CBT is not initially aimed for high income generation. It is just a tool for villagers to seek for additional income (Strasdas, 2005). Although CBT gets involved in business activities, it is not a fully commercial project. The practice of villagers is also not as professional as in tourism industry in cities. The carrying capacity is also limited.

The average income per household from CBT did not exceed the average income from agricultural production according to Untong et al (2006), Oula, (2006), and Prachvuthy (2006). In case of Mae Kam Pong village in Thailand, the average tourism income in 2003 was US\$175 while the average non-tourism income was US\$750. In case of Nammat Mai village in Lao PDR, the average tourism income was US\$28 whereas non-tourism income was US\$38. In case of Chambok village in Cambodia, tourism activities yielded only US\$26 per household per year while agricultural activities yielded US\$158. Most villagers participating in tourism sectors concerned the activities as part-time jobs.

Tourism income generation is not limited to only direct payment from tourists to villagers. There is indirect effect which is the expenditures from tourism sector to other non-tourism sectors. Mitchell and Ashley (2007) emphasized the significance of this indirect effect. They calculated that around 50 – 90 percent of the impact of tourism came from the indirect effect. It means that the income multiplier can range from 2 to 10. The expenditures include spending of tourism staffs on food and non-food consumption, purchasing of intermediate goods for tourism activities, and money transfer from tourism sectors to other

public institutions such as temples and schools. Kaosa-ard (2006), Untong et al (2006), Oula, (2006), and Prachvuthy (2006) studied the income generated by CBT but the studies did not take into account of the indirect effect and the general equilibrium.

Bill, Farr and Snowdon (1997) provided the approximation of the multiplier but not from CGE model. They investigated the economic impact of rural tourism. They classified rural tourism into two categories, hard and soft tourism. Hard tourism is characterized by externally owned large-scale developments. Soft tourism is tourism activities which embedded within a local economy and engage local people into it. They quantified the impacts into three dimensions, direct, indirect and induced impacts. Direct impact is the impact of tourist spending on incomes and jobs at businesses where tourists spend their money. Indirect impact is the impact resulting from successive rounds of local business transactions that result from tourist spending. Induced impact is defined as the impact on incomes and jobs of the spending of income earned as a result of spending by tourist. They used the decomposition method in calculating the impacts. It was a simple method and not CGE. They surveyed data from 120 tourism-related businesses and 1,800 tourists in Scotland. They found that hard tourism made more money from tourists whereas small soft tourism yielded greater income multiplier. However, the figure of the multiplier was small. It was around 1.10 and 1.15 for hard and soft tourism respectively.

3.2) Income distribution

A major goal of CBT is to share the income to village members as wide as possible. However, the goal was not achieved to Kaosa-ard (2006), Untong et al (2006), Oula (2006) and Prachvuthy (2006).

Villagers could not share the tourism income if they did not participate in CBT. There are several hypotheses why villagers did not participate in tourism activities. Firstly, the relative return in non-tourism sectors was higher than in tourism sector. Prachvuthy (2006) reported that 56 percent of villagers in Chambok village in Cambodia did not participate in tourism activities. More than half of them revealed that they would like to grow vegetables and fruits instead. The return from industrial and commercial activities (US\$203 per household per year) and agricultural activities (US\$158) were apparently higher than tourism activities (US\$26). Untong et al (2006) also reported that only 30 percent of villagers in Mae Kam Pong village in Thailand participated in tourism. Households gained average income from non-tourism and tourism activities around US\$750 and US\$175 per year respectively.

In contrast, it was not a case in Nammat Mai village in Lao PDR where a narrower gap of the relative returns was observed. Oula (2006) reported that almost every villager participated in tourism. The average non-tourism income was around US\$38 per household per year whereas tourism income yielded around US\$28.

Secondly, the poor might be interested in tourism but could not enter the sector. They might lack of necessary capitals and skills necessary for tourism activities according to Untong, et al (2006), Prachvuthy (2006) and Oula (2006). Villagers who could not provide standard service to tourists were not selected by village's leaders to participate in tourism. In contrast, in a village where there was no need for advanced physical capitals and advanced skills, Oula (2006) found that most of villagers participated in tourism activities. CBT in Nammat Kao and Nammat Mai villages in Lao PDR were heavily related to primary life style of villagers.

Although the studies of Kaosa-ard (2006), Untong et al (2006), Oula (2006), and Prachvuthy (2006) provided a perfectly clear picture of uneven tourism income distribution, they were limited to only direct effect which villagers received income directly from visitors. They did not follow the expenditure spent by the tourism sector to other sectors in the village which is the indirect effect. They also hypothesized in their own literatures that when the indirect effect is included, the result may be changed in a better way. It is therefore interesting how much of the improvement of the tourism income distribution if the indirect effect is also calculated. This answer required a SAM and VCGE for the investigation of both direct and indirect effects.

A study of Wattanakuljarus and Coxhead (2008) took consideration of both effects and found that the distribution was also uneven. The study was at a national level. They focused on the effect of inbound tourism on income distribution. They found that tourism growth benefits all household classes. However, high income and non-agricultural households benefited more from tourism. One of the causes was that the expansion of foreign tourism demand brings about a real appreciation that undermines profitability and reduces employment in tradable sectors, notably agriculture, from which the poor derive a substantial fraction of their income. They emphasized that inbound tourism expansion is not pro-poor as long as owners of primary factors in agriculture and other labor-intensive tradable sectors do not participate in tourism-related activities. Unfortunately, the paper did not mention about the income multiplier of tourism.

4. Village Computable General Equilibrium (VCGE)

In this section, firstly the VCGE will be introduced about its history, advantages and disadvantages. Secondly, the specification of the VCGE which will be used in this study will be shown. The specifications will include an Input-Output (I-O) table, a Social Accounting Matrix (SAM) and the VCGE model. Lastly, how to apply the model to answer key questions in this study will be clarified.

a) Introduction to VCGE

Computable General Equilibrium was firstly applied to village economies in Taylor and Adelman (1996). The model was based on Social Accounting Matrix (SAM). Taylor and Adelman were also pioneers in using SAM for village economic analysis (Adelman, Taylor and Vogel, 1988).

The VCGE model is a combination between a neoclassical household-farm model (Barnum and Squire, 1979; Singh, Squire, and Strauss, 1986) and SAM. On the other hand, SAM is a combination of an Input-output (I-O) analysis and an expenditure system (Davis et al, 2002)

b) Comparison between VCGE and neoclassical household-farm model

Davis et al (2002) mentioned the advantage of VCGE over neoclassical household-farm (HF) model as listed below.

- VCGE captures the production and expenditure linkages among households while the HF model does not capture this issue.
- VCGE introduces the general equilibrium feedback effects while the HF model does not take the feedback effect into account.

c) Comparison between VCGE and SAM

Advantages of VCGE over SAM were also mentioned below.

- VCGE captures the price effect while SAM is the fixed-price model.
- VCGE allows non-linearity in household-farm responses to policy changes while SAM assumes production utilizes linear and fixed-proportion technologies.
- VCGE relaxes the assumption of perfectly elastic supply used in SAM by applying the family resources constraints on production.

- VCGE uses data base from SAM, therefore the model captures the detail of income and expenditure patterns of household groups and institutions listed in SAM.

d) Comparisons of VCGE and CGE

Some of differences between VCGE and CGE are listed below.

- VCGE fixes the exchange rate equal to one. This is because the village economy is a part of a national economy. Then values of money inside and outside the village are the same. This is crucial to the explanation of the results such that normal CGE models explain their results based on the appreciation or depreciation of the exchange rate.
- Import prices are held constant because nothing in the model affects external prices.
- Savings are treated as capital export since there is no bank in the village. A normal CGE can hold savings inside the economy without the need of its export to the rest of the world.
- Tax may be ignored in the VCGE because households may have income less than a threshold to pay tax. It cannot be an exemption in a normal CGE.
- Households are a major institution in VCGE model while they are part of many institutions in the normal CGE.
- VCGE can model both close and open economies according to the distance between a village and the nearby city. If the village is isolated, the model of close economy can be applied. Otherwise, if the village trades heavily with the city, it can be modeled as a small open economy. This is different from normal CGE such that the CGE is actually used for open economy because a nation usually trades with the world.

e) Limitations of VCGE

There are limitations of VCGE mentioned as follows.

- The most important criticism upon VCGE is related to data and parameter values. There are many problems related to consistency, reality and adequacy of data in a village economy.
- VCGE cannot model the long-run process of development and change because it cannot predict inter-temporal structural change.

f) Programming the VCGE

The study constructs a VCGE model by adopting a CGE model in Matlab written by Prof. Johannes Broecker, University of Kiel, Germany. The program was based on the Shoven-Whalley model of a small open economy.

The advantage of modeling VCGE in Matlab is that it is flexible for various kinds of shocks. It needs not to write a new program from the first line when a new shock is presented. It requires only a modification in the front layer. Moreover, it is transparent such that it can be traced the process step by step.

The disadvantage is the complexity of layers in the program. It adopts many shortcut commands. Even the commands are transparent, they are clarified in other files. Researchers need to trace the files and learn from each of them.

5. The target village

Mae Kam Pong village in Chiang Mai is an outstanding and suitable for this study. It is the first CBT village in Northern Thailand. It has experienced the CBT since December 2000. It received awards of outstanding CBT two times, in 2004 the prime minister OTOP award, and 2007 the award from Tourism Authority of Thailand. It is like a school for other villages to learn how to establish CBT.

The village is located to the east of Chiang Mai province, around 50 kilometers from downtown. It is a highland village at the latitude about 1,300 meters above the sea level. Its age was dated back to 100 years ago. In 2007, it consisted of 124 households with around 500 villagers. The villagers are local Northern Thai. They speak official Thai and Northern Thai language.

There are several advantages for conducting a study at Mae Kam Pong village. They are listed below.

❖ ***The community's power in tourism control.*** According to the principle of CBT, the ownership and management of tourism activities should be controlled by the community. Villagers in this village occupy all tourism assets and control all tourism activities.

❖ ***The participation of villagers.*** Not only adults participating in tourism sector, but also children show traditional dancing to visitors. Farmers also let visitors to visit their plantations. There are senses of hospitality to tourists all around the village.

❖ **The economic linkages.** Varieties of economic linkages can be found in the village. Agriculture, souvenir productions, commerce and services are linked to tourism sector. The village operates its own water work and run a micro hydro-power plant which represents the utility sector in the village.

❖ **The growing stage of CBT life cycle.** Annual tourism income of the village grew up from around US\$5,300 in 2003 (Untong, et al, 2006) to US\$34,000 in 2006 (Suriya, Srichoochart and Pruekruedee, 2007). The average income growth was around 85 percent per year. This high growth rate was classified by Kotler (2000) as a growing stage in the product life cycle model. It indicates that this village has already passed that introductory stage of CBT while many other villages are still stuck in the introductory stage.

❖ **The size of the village.** Composing from 124 households, the village is not too big and not too small. Data collection for the construction of Social Accounting Matrix (SAM) within a time frame of one year can be possible.

❖ **The language.** Villagers speak Northern Thai. There is no need for a translator because the researcher and staffs understand the language. It is good for asking deeper questions and getting the answers clearly. It is easier to make friends with villagers who speak the same language and share the same customs.

❖ **The accessibility.** The village is linked by concrete roads from downtown. There will be no problem getting access to the village in the rainy season.

❖ **The interest of policy makers.** Mae Kam Pong village won the outstanding CBT awards two times. The village appears in case studies of scholars and other villages. Policy makers also learn from the village for the promotion of CBT around the country. Therefore, the research conducted in this village will gain interest from policy makers in Thailand.

6. The data

The survey in the village took place during August 2008 to March 2009. The reference period (RP) in this study was between May 1st 2007 and April 30th 2008. The RP was set following the beginning of a major cash crop season, the fermented tea.

The survey method was the census. The population of 124 households was officially registered. The project approached every household whose residents were presented. It found only 116 households with active members. The rest was abandoned.

The questionnaire was 125-page long. It was given from Dr. Arjunan Subramanian who conducted the first SAM at the village level using the census method (Subramanian (2007)).

7. Settings of the model and simulations

7.1 Settings of the model

To proceed the analysis in Village CGE (VGE) model, the data in SAM were arranged again into five matrices as followed.

Matrix 1: Payment matrix

Matrix 2: Income matrix

Matrix 3: Capital Export matrix

Matrix 4: Indicator of payment in domestic markets

Matrix 5: Indicator of income from domestic markets

Matrix 6: Transfers to household

Matrix 7: Factor exports

In the model, there were 17 activities. Each sector produced only one product. Every sector apart of tourism and construction sold their products both in domestic and world markets.

Tourism was decomposed into 4 activities, homestay, core tourism, souvenir shop and coffee shop.

Households were classified in to 5 groups according to their income quintile. Income of households was decomposed into 4 sources. They were wage from being hired labor, rent, retained value added, and transfer.

The transfers to households were fixed. Factor exports were also fixed. Exchange rate was fixed to one. However, capital export was flexible. The allocation of capital export to households was fixed to a ratio as appeared before the shock.

Elasticity of substitution was assumed to be one for all firms and households. Elasticity of transformation was assumed to be 1.2 for all firms.

7.2 Simulations

First, the model will be simulated under an assumption of full-employment. The expansion of world tourism demand, assumed to be perfectly elastic, would cause tourism price to be higher. The scenarios are set to be 10%, 20% and 30% of the tourism price increase. Tourism prices in four sectors which are sold only to tourists, i.e. homestay, core tourism, souvenir shop and coffee shop, would be shocked at the same rate in each simulation.

Second, the simulation will handle the case of increasing endowment in the village. There are two possible sources of the additional endowments. First, people from other villages may come to stay in the village. Second, the village may be in the situation of underemployment which means that the villagers still have some free working hour. The simulation will vary the endowment expansion to be 10%, 20% and 30%. Each case will be simulated with three cases of the tourism price increase.

8. The Results

The results were divided into three parts. First the overall impacts will be reviewed. Second, the impacts on industries will be shown. Last, the impacts on households will be highlighted.

8.1 Overall impacts

Tourism price increase would create industrial income more than destroy it. In table 8.1, it can be seen that the destruction of the income was smaller when the endowment expansion got larger. However, considering a full employment scenario, the income destruction was higher when tourism demand was expanding. This may be because the supply in the village was shortage to handle the larger number of tourists. The net income generation in this case was not getting much bigger when more tourists visited the village.

Table 8.1: The net generation of industrial income

Tourism price increase	The shock (Baht)	Endowment expansion			
		0%	10%	20%	30%
		The generation of industrial income			
10%	165,915	404,408	2,113,025	4,042,622	5,975,221
20%	331,831	748,427	2,272,425	4,176,090	6,135,736
30%	497,746	1,064,754	2,415,387	4,295,652	6,266,861
		The destruction of industrial income			
10%	165,915	236,603	8,837	0	0
20%	331,831	513,288	72,402	6,524	36
30%	497,746	791,507	147,109	29,253	935
		Net generation of industrial income			
10%	165,915	167,805	2,104,188	4,042,622	5,975,221
20%	331,831	235,140	2,200,023	4,169,566	6,135,700
30%	497,746	273,247	2,268,278	4,266,398	6,265,926

Source: Simulation

Table 8.2 : Impact of tourism price increase

Tourism price increase	Direct effect (Baht)	Endowment expansion			
		0%	10%	20%	30%
		Indirect effect (Baht)			
10%	165,915	167,805	2,104,188	4,042,622	5,975,221
20%	331,831	235,140	2,200,023	4,169,566	6,135,700
30%	497,746	273,247	2,268,278	4,266,398	6,265,926
		Total effect (Baht)			
10%	165,915	333,720	2,270,103	4,208,537	6,141,136
20%	331,831	566,970	2,531,854	4,501,396	6,467,530
30%	497,746	770,992	2,766,023	4,764,144	6,763,672

Source: Simulation

Table 8.3: Multiplier of the tourism price increase

	Endowment expansion			
	0%	10%	20%	30%
Tourism price increases 10%	2.01	13.68	25.37	37.01
Tourism price increases 20%	1.71	7.63	13.57	19.49
Tourism price increases 30%	1.55	5.56	9.57	13.59

Source: Simulation

The income multiplier went down when more tourists visited the village, given a constant endowment (Table 8.3). This is because the shortage of labor supplies to serve the tourists. The multiplier could vary drastically from below 2 to more than 30. This depends very much on the size of tourism price increase and the endowment expansion.

Table 8.4 : The net generation of value added

Tourism price increase	The shock (Baht)	Endowment expansion					
		0%	10%	20%	30%		
		The generation of value-added					
10%	165,915	230,164	232,825	222,604	214,806		
20%	331,831	474,426	451,911	422,814	396,882		
30%	497,746	706,585	662,766	619,493	580,358		
		The destruction of value-added					
10%	165,915	35,358	28,407	20,509	13,166		
20%	331,831	63,270	53,977	44,027	34,292		
30%	497,746	80,520	70,680	60,299	49,881		
		Net generation of value-added					
10%	165,915	194,805	204,418	202,095	201,640		
20%	331,831	411,156	397,934	378,786	362,590		
30%	497,746	626,065	592,086	559,194	530,477		

Source: Simulation

Table 8.5 : Value added multiplier

	Endowment expansion			
	0%	10%	20%	30%
Tourism price increases 10%	1.17	1.23	1.22	1.22
Tourism price increases 20%	1.24	1.20	1.14	1.09
Tourism price increases 30%	1.26	1.19	1.12	1.07

Source: Simulation

Unlike the income multiplier, the value-added multiplier was decreasing slightly when more tourists came to the village (Table 8.5). It was even larger in the case of full-employment. The overall ratio of the value-added multiplier seemed to be clustered around 1.07 and 1.26.

8.2 Impacts on industries

Souvenir shop, souvenir production and pillow sewing (a process in souvenir manufacturing) were among top gainers of the tourism benefit (Table 8.6). They could expand more than the rate of tourism price increase.

In the same table, it can be seen that more industries will be gainers when additional endowments were available. In this case, agricultural products such as tea and coffee changed from losers to be gainers.

Table 8.6 : Industries who are gainers when tourism price increases 10%

No.	Sectors	Growth of the industrial value (%) assumed full employment	No.	Sectors	Growth of the industrial value (%) assumed underemployment 10%
1	Souvenir shop	27.82	1	Souvenir shop	36.07
2	Souvenir production	18.01	2	Homestay	28.32
3	Homestay	11.02	3	Souvenir production	25.59
4	Pillow sewing	10.72	4	Services	18.61
5	Services	7.55	5	Pillow sewing	17.73
6	Infrastructure	7.06	6	Household Manufacturing	13.85
7	Household Manufacturing	6.87	7	Core tourism	13.67
8	Coffee shop	5.94	8	Livestock	12.79
9	Livestock	5.29	9	Construction	12.62
10	Construction	1.83	10	Infrastructure	11.26

No.	Sectors	Growth of the industrial value (%) assumed full employment	No.	Sectors	Growth of the industrial value (%) assumed underemployment 10%
11	Core tourism	1.48	11	Coffee shop	10.66
			12	Commerce	9.03
			13	Tea	8.25
			14	Coffee	7.62
			15	Administration	1.63

Source: Simulation

A tourism-agricultural linkage is weak. Tea shares around 22% in the cost of souvenir production. Coffee is around 49% of total cost of coffee shop. However, these two sectors cannot absorb much of the agricultural products. Souvenir production absorbs only 6% of tea and buys only dried tea leaves. Coffee shop absorbs around 14% of coffee. Homestay and core tourism buy almost nothing from agriculture. Materials for food cooked for tourists are mainly from outside the village.

The variation in the rate of tourism expansion did not change the rank of gainers and losers much as shown in table 8.7 to 811.

Table 8.7 : Industries who are gainers when tourism price increases 20%

No.	Sectors	Growth of the industrial value (%) assumed full employment	No.	Sectors	Growth of the industrial value (%) assumed underemployment 10%
1	Souvenir shop	59.10	1	Souvenir shop	68.83
2	Souvenir production	37.29	2	Souvenir production	45.59
3	Pillow sewing	21.95	3	Homestay	37.76
4	Homestay	19.04	4	Pillow sewing	29.28
5	Infrastructure	18.69	5	Services	25.77
6	Services	14.42	6	Infrastructure	20.77
7	Household Manufacturing	13.86	7	Household Manufacturing	20.43
8	Coffee shop	8.13	8	Livestock	16.04
9	Livestock	7.51	9	Coffee shop	15.03
10	Construction	2.23	10	Core tourism	14.34
			11	Construction	13.09
			12	Commerce	7.68
			13	Tea	6.42
			14	Coffee	4.92

Source: Simulation

Table 8.8 : Industries who are gainers when tourism price increases 30%

No.	Sectors	Growth of the industrial value (%) assumed full employment	No.	Sectors	Growth of the industrial value (%) assumed underemployment 10%
1	Souvenir shop	93.75	1	Souvenir shop	104.75
2	Souvenir production	57.71	2	Souvenir production	66.49
3	Pillow sewing	33.57	3	Homestay	46.02
4	Infrastructure	30.63	4	Pillow sewing	41.06
5	Homestay	26.22	5	Services	31.25
6	Services	19.49	6	Infrastructure	30.83
7	Household Manufacturing	19.44	7	Household Manufacturing	25.95
8	Livestock	7.97	8	Livestock	18.12
9	Coffee shop	7.46	9	Coffee shop	17.26
10	Construction	1.91	10	Construction	12.86
			11	Core tourism	12.46
			12	Commerce	6.32
			13	Tea	4.63
			14	Coffee	2.25

Source: Simulation

Number of losers reduced drastically when more endowments were ready to serve the expansion of tourism demand and the induced demand. Utilities, administration and plants were among top losers even though the endowments were expanded. The decline of utilities sector was because its rising price and an easy substitution of the same service provided by public providers outside the village. Plants were not consumed much inside the village therefore the rising household income did not help this sector much.

Table 8.9 : Industries who are losers when tourism price increases 10%

No.	Sectors	Growth of the industrial value (%) assumed full employment	No.	Sectors	Growth of the industrial value (%) assumed underemployment 10%
1	Utilities	-12.4	1	Utilities	-2.94
2	Administration	-6.12	2	Plants	-0.64
3	Coffee	-2.33			
4	Tea	-1.53			
5	Plants	-1.44			
6	Commerce	-1.04			

Source: Simulation

Table 8.10 : Industries who are losers when tourism price increases 20%

No.	Sectors	Growth of the industrial value (%) assumed full employment	No.	Sectors	Growth of the industrial value (%) assumed underemployment 10%
1	Utilities	-20.23	1	Utilities	-11.34
2	Administration	-10.68	2	Administration	-3.31
3	Coffee	-4.97	3	Plants	-2.47
4	Plants	-3.68			
5	Tea	-3.34			
6	Commerce	-2.45			
7	Core tourism	-1.40			

Source: Simulation

Table 8.11 : Industries who are losers when tourism price increases 30%

No.	Sectors	Growth of the industrial value (%) assumed full employment	No.	Sectors	Growth of the industrial value (%) assumed underemployment 10%
1	Utilities	-25.36	1	Utilities	-16.94
2	Administration	-13.55	2	Administration	-6.57
3	Core tourism	-7.74	3	Plants	-4.59
4	Coffee	-7.58			
5	Plants	-6.24			
6	Tea	-5.08			
7	Commerce	-3.87			

Source: Simulation

8.3 Impacts on households

The impacts on households will be shown in two parts. It will begin with the gross income and follow by the real income.

8.3.1 Gross income

The richest quintiles of households would be the top gainer of the tourism benefit. Their income growth will range from around 3.50% to 4.0% (Table 8.12). The second richest households and the middle households were second and third largest gainers. However, the poorest and second poorest quintiles seemed not to gain anything of the benefit. They may even face the income drop a little bit.

Table 8.12 : Income growth of households when tourism price increases 10%

No.	Household quintiles	Income growth (%)			
		Endowment expansion 0%	Endowment expansion 10%	Endowment expansion 20%	Endowment expansion 30%
1	Poorest	0.14	0.08	0.02	-0.04
2	Second poorest	-0.07	-0.06	-0.04	-0.03
3	Middle	1.10	1.35	1.61	1.85
4	Second richest	2.56	2.28	1.99	1.73
5	Richest	3.58	3.91	3.92	3.97

Source: Simulation

In table 8.13, the more expansion of tourism benefits the richest, the second richest and the middle households more. The benefit still did not go to the poorest and second poorest. This was because villagers in these two classes did not participate much in tourism activities. The only possible income that they could gain from tourism was via the tourism-agricultural linkage. The linkage was not so strong in this case. Then it can be clearly seen that the poorest and second poorest almost gained nothing from tourism.

Table 8.13 : Income growth of households when tourism price increases 20%

No.	Household quintiles	Income growth (%)			
		Endowment expansion 0%	Endowment expansion 10%	Endowment expansion 20%	Endowment expansion 30%
1	Poorest	0.15	0.11	0.08	0.06
2	Second poorest	-0.05	-0.03	0.02	0.05
3	Middle	2.64	2.80	2.99	3.19
4	Second richest	5.35	5.05	4.69	4.34
5	Richest	7.47	7.22	6.80	6.47

Source: Simulation

In table 8.14, the 30% increase of world tourism demand also seemed to benefit only to the three top classes. It still excluded the poorest and second poorest out of the list of gainers.

Table 8.14 : Income growth of households when tourism price increases 30%

No.	Household quintiles	Income growth (%)			
		Endowment expansion 0%	Endowment expansion 10%	Endowment expansion 20%	Endowment expansion 30%
1	Poorest	0.13	0.13	0.13	0.13
2	Second poorest	0.09	0.12	0.17	0.23
3	Middle	4.43	4.46	4.58	4.74
4	Second richest	8.24	7.91	7.51	7.10
5	Richest	11.15	10.37	9.63	8.99

Source: Simulation

8.3.2 Real income

Along with the pathway of tourism development, the consumer price index rose according to higher demand from both villagers and tourists. Therefore, the benefits from the gross income growth will be lessened by the increasing price. The real income growth was slightly less than the gross income growth. In table 8.15 to 8.17, it showed that the richest and second richest households were clearly benefit from tourism with positive real income growth. The middle class was still ambiguous relying on the rate of tourism expansion and the rate of endowment expansion.

Table 8.15 : Real income growth of households when tourism price increases 10%

No.	Household quintiles	Real income growth (%)			
		Endowment expansion 0%	Endowment expansion 10%	Endowment expansion 20%	Endowment expansion 30%
1	Poorest	-0.37	-0.42	-0.48	-0.54
2	Second poorest	-0.58	-0.58	-0.57	-0.57
3	Middle	0.75	1.00	1.26	1.50
4	Second richest	2.22	1.94	1.65	1.39
5	Richest	3.37	3.69	3.69	3.74

Source: Simulation

Table 8.16 : Real income growth of households when tourism price increases 20%

No.	Household quintiles	Real income growth (%)			
		Endowment expansion 0%	Endowment expansion 10%	Endowment expansion 20%	Endowment expansion 30%
1	Poorest	-0.89	-0.92	-0.96	-0.99
2	Second poorest	-1.12	-1.11	-1.08	-1.06
3	Middle	1.91	2.06	2.25	2.45
4	Second richest	4.63	4.33	3.97	3.63
5	Richest	7.01	6.75	6.33	5.99

Source: Simulation

In table 8.16 and 8.17, it can be seen that the second poorest quintiles would benefit the real income growth just when tourism grew around 20%. However, the poorest households need the tourism expansion at the rate of 30% to ensure that they will gain positive real income growth.

Table 8.17 : Real income growth of households when tourism price increases 30%

No.	Household quintiles	Real income growth (%)			
		Endowment expansion 0%	Endowment expansion 10%	Endowment expansion 20%	Endowment expansion 30%
1	Poorest	-1.46	-1.48	-1.49	-1.50
2	Second poorest	-1.57	-1.55	-1.51	-1.47
3	Middle	3.28	3.31	3.42	3.57
4	Second richest	7.10	6.78	6.39	5.98
5	Richest	10.41	9.63	8.87	8.23

Source: Simulation

9. Conclusions

This study was the first time that SAM and CGE were constructed for a particular village in Thailand. The purpose was to investigate the income generation and income distribution with both direct and indirect effects. For the income generation, the income multipliers varied from 1.55 -37.01. They depended heavily on the rate of tourism expansion and the rate of endowment expansion. The value-added multipliers were more stable which were clustered around 1.07 and 1.26.

Top gainers of industrial income were those related to souvenir, e.g. souvenir shop, souvenir production and pillow sewing. They could grow at the higher rate than tourism expansion. Top losers were those providing basic services to the village but substitutable by the offer of public providers outside the village.

For the income distribution, the results supported the argument of uneven income distribution. The richest households gained the highest benefits in both terms of gross and real income. The poorest households gained the least and even experienced the drop of their real consumption. This was because the increasing consumer's price which would offset some benefits that they may gain indirectly via a hopeful but weak tourism-agricultural linkages.

10. Policy suggestions

- 10.1 The promotion of community-based tourism should cover souvenir production. The results showed clearly that the sector was the top gainer when tourism expands in a village. This sector can absorb unskillful labors from the poorest and second poorest households.
- 10.2 The poorest and second poorest households should be enhanced to participate directly in tourism activities. The results showed that they gained less from tourism due to less participation in the sector. This can be done via the provision of micro-credit, e.g. credit for upgrading houses to be accommodation for tourists.
- 10.3 The tourism-agricultural linkage should be strengthened. If it was not by including agricultural products into meals for tourists, it should find a way to include it into souvenir production. For example, the dried tee leaves were put into pillows to make it smell good.

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12. References

- Adelman, Irma, J. Edward Taylor and Stephen Vogel. 1988. Life in a Mexican Village. **Journal of Development Studies** 25, pp. 5 -24.
- Alvord, Christina et al. 2007. **Climate and Tourism in the Colorado Plateau: A Workshop Summary**. Focus article from intermountain west climate summary (June 2007). [online] http://www.colorado.edu/products/forecasts_and_outlooks/intermountain-west_climate_summary/articles/WWA_Jun_2007_focus.pdf
- Ashley, Caroline and Elizabeth Garland. 1994. **Promoting Community-based Tourism Development: Why, What and How?** Ministry of Environment and Tourism of Namibia, Research discussion paper No.4 (October 1994).
- Ashley, Caroline, Dilys Roe and Harold Goodwin. 2001. **Pro-poor Tourism Strategies: Making tourism work for the poor: A review of experience**. Pro-poor Tourism Report 1. London: Oversea Development Institute.
- Brennan, Frank and Garth Allen. 2001. Community-based Ecotourism, Social Exclusion and the Changing Political Economy of KwaZulu-Natal, South Africa. In David Harrison (ed.). **Tourism and the Less Developed World: Issues and Case Studies**. Oxon: CABI Publishing.
- Goodwin, Harold. 2006. **Community-based tourism: failing to deliver?** University of Sussex, Institute of Development Studies. [online] <http://www.id21.org/society/insights62art6.html>

- Kaosa-ard, Mingsarn. 2006. Tourism: Blessings for All? **Journal of GMS Development Studies** 3, 1 (July 2006): pp. 1 -24.
- Mitchell, Jonathan and Caroline Ashley. 2007. Pathways to Prosperity – How can tourism reduce poverty: A review of pathways, evidence and methods. In Can tourism offer pro-poor pathways to prosperity? Examining evidence on the impact of tourism on poverty. **ODI Briefing Paper 22** (July 2007).
- Oula, Thavipheth. 2006. Financial Benefits and Income Distribution of Community-Based Tourism: Nammat Kao and Nammat Mai, Lao PDR. **Journal of GMS Development Studies** 3, 1 (July 2006): pp. 57 - 68.
- Prachvuthy, Men. 2006. Tourism, Poverty, and Income Distribution: Chambok Community-based Ecotourism Development, Kirirom National Park, Kompong Speu Province, Cambodia. **Journal of GMS Development Studies** 3, 1 (July 2006): pp. 25 -40.
- Subramanian, Arjunan. 2007. **Distributional Effects of Agricultural Biotechnology in a Village Economy: The Case of Cotton in India**. Goettingen: Cuvillier.
- Subramanian, Shankar. 1996. Production and distribution in a dry-land village economy. In J. Edward Taylor and Irma Adelman. **Village Economies: The Design, Estimation, and Use of Village wide Economic Models**. Cambridge: Cambridge University Press.
- Suriya, Komsan, Siriporn Srichoochart, and Sumate Pruekruedee. 2007. **Tourism Logistics of Community-Based Tourism**. A paper in the Development of Integrated Sustainable Tourism in GMS Project: Comparison of Logistics. Chiang Mai: Social Research Institute, Chiang Mai University (in Thai)
- Taylor, J. Edward and Irma Adelman. 1996. **Village Economies: The Design, Estimation, and Use of Village wide Economic Models**. Cambridge: Cambridge University Press.
- Untong, Akarapong, et al. 2006. Income Distribution and Community-Based Tourism: Three Case Studies in Thailand. **Journal of GMS Development Studies** 3, 1 (July 2006): pp. 69 - 82.
- Wattanakuljarus, Anan and Ian Coxhead. 2008. Is Tourism-Based Development Good for the Poor? A General Equilibrium Analysis for Thailand. **Journal of Policy Modeling** 30, 6 (November-December): pp. 929-955