

TDRI

Quarterly Review

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Do Thailand's Grass Roots Policies such as "30 Baht Health Scheme" and "People's Bank Program" really seem to be the "Think New-Act New" agenda as the government argued? See related article on page 3.

Thailand's Grass Roots Policies*

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The political agenda of the Thai Rak Thai or Thaksin government is "Think New-Act New." Based on this agenda, many grass roots policies such as: Debt Suspension for Farmers, Village and Urban Community Fund (VUCF), Universal Healthcare Coverage (UC) or 30 Baht Health scheme, One-Tambon-One-Product (OTOP), and People's Bank have been introduced. It was on this platform during the general election that Prime Minister Thaksin Shinawatra announced his party's policies, and it succeeded in catching attention of the public. The very appealing names of these policies also played a part in creating interest in the minds of the masses. The Thai Rak Thai government has been on duty for two years; it is worth examining the impact of these grass roots policies.

This article is divided into two parts. The first part describes five major grass roots policies. The second part analyzes whether these policies really benefit the "Think New-Act New" agenda.

I. GRASS ROOTS POLICIES

The Thai Rak Thai is the political party that got mandated in January 2001 elections and formed the new

government in Thailand. After two months of being in power, on March 20, the government launched its first program—the Debt Suspension for Farmers. Two days later, the VUCF was implemented. The new government wanting to prove its sincerity and commitment to the public began implementing their policies within the first six months of their governance. Since the previous governments had failed to keep their election promises, the actions of the new government greatly impressed ordinary people.

The government spent about Baht 153 billion or US\$ 3.6 billion¹ on the five programs in 2001-02 (Table 1). The funding for most of these programs came from government budget, except for the VUCF. The government used non-budgetary tactic to finance the VUCF program by borrowing from the Government Savings Bank (GSB), promising to repay their debt within eight years. The government spending on the VUCF was large, totaling almost 50 percent of the spending amount on the five programs. Additionally, the beneficiaries in this program were small in comparison to those in the UC program. The five programs are detailed in the following.

Table 1 Major Thai Grass Roots Programs in 2001-02

Program	Launched	# of Beneficiaries	Government Spending (Baht)
Debt Suspension for Farmers ¹	March 2001	2,270,054 (as of Feb. 2002)	8,000 million (in 2002)
Village and Urban Community Fund ²	March 2001	5,306,611 (as of July, 2002)	74,881 million
Universal Healthcare Coverage ³	April 2001	46.5 million (as of Sept. 2002)	63,893 million (in 2002)
One-Tambon-One-Product ⁴	May 2001	6,822 Tambons (as of Nov. 2002)	50 million (in 2002)
People's Bank ⁵	June 2001	405,137 (as of Aug. 2002)	6,612 million

Sources: 1. <http://www.fpo.mof.go.th>
 2. The VUCF National Committee (2002).
 3. Viroj et al. (2002).
 4. <http://www.thaitambon.com>
 5. <http://www.gsb.or.th>

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Debt Suspension for Farmers Program

The Debt Suspension for Farmers program allows registered farmers to suspend their debts payable to the Bank for Agriculture and Agricultural Cooperatives (BAAC) for three years. The maximum amount of the BAAC debt an eligible farmer can suspend is Baht 100,000 (US\$ 2,326). The eligible farmer can choose any one of these two options:

- Temporary debt suspension for three years. Registered farmers do not have to repay their principal and interest to the BAAC for three years. During the suspension period, the registered farmers can make no additional request for loans. After the deferral period, the registered farmers have to repay the principal and interest at the rate paid before entering the program.
- Temporary interest rate reduction for three years. The registered farmers get a discount of 3 percentage point from the annual loan interest rate and get a premium of 1 percentage point on top of the annual deposit interest rate for the deposit of Baht 50,000 (US\$ 1,163) and below. In this option, the farmers can still ask for additional loans, not in excess of Baht 100,000 (US\$ 2,326), or an emergency loan, not in excess of Baht 30,000 (US\$ 698).

During the suspension period, the government bears the farmers' interest burden, which approximated to Baht 8,000 million (US\$ 186 million) in FY2002. Until February 2002, there were 2.27 million registered farmers, and the total amount of loan was Baht 85.9 billion (US\$ 2 billion). Approximately equal number of registered farmers chose each option.

Village and Urban Community Fund (VUCF) Program

The VUCF is one of the most urgent government policies. The program is well known as the "one million baht village fund," because the scheme involves allocating one million baht revolving fund to every rural village and urban community. The objectives of the VUCF are: to provide revolving fund for individuals and households; to promote local communities' capacity building of fund management; to stimulate grass roots economy; and to empower and strengthen rural and urban communities. Individuals and households in the community can get a loan from their VUCF for investment purpose or payment of emergency expenses. Each community exercises its leverage on the distribution of the fund in accordance with the individual's needs.

The top priority of the VUCF is to systematically develop grass roots economy based on the principle of participatory approach, self-reliance, and mutual assistance. The government administrates the VUCF through



the VUCF National Committee, the Supportive Sub-Committee on the VUCF Implementation, Provincial Supportive Sub-Committee, and County Supportive Sub-Committee. Participation of people in the communities is at the lowest level of administration, namely the VUCF Committee. To establish the VUCF Committee, at least three-fourth of the fund members in the community have to participate in the community's meeting and select 15 committee members. These fund members then set rules and regulations for the VUCF and fund management. However, they must operate within the parameters set by the national guidelines. The amount of the loan should not exceed Baht 20,000 or US\$ 465. Loans in excess of Baht 20,000 but not more than Baht 50,000 have to be approved by the VUCF members, and the term of the loan is for one year.

The VUCF National Committee allocates one million Baht to villages and urban communities only if they have achieved the following conditions.

- Readiness, awareness and participation among people in villages or communities.
- Readiness of the local VUCF Committee in terms of knowledge and fund management experiences.
- Readiness in monitoring loanholders, assessing capability of the fund members.
- Readiness in holistic management capability of the other projects funded in the villages and communities.

The target number of the villages and communities with the VUCF was 74,881 (Table 2). At the end of July 2002, the government disbursed the money to approximately 98 percent of the targeted villages and communities (altogether US\$ 1.659 billion). Only 26 percent of the communities in Bangkok have managed to set up the VUCF Committee, this low figure reflects lack of desire of the people to play an active role in the affairs of the community. At the end of September 2002, approximately 5.3 million loan proposals all over the

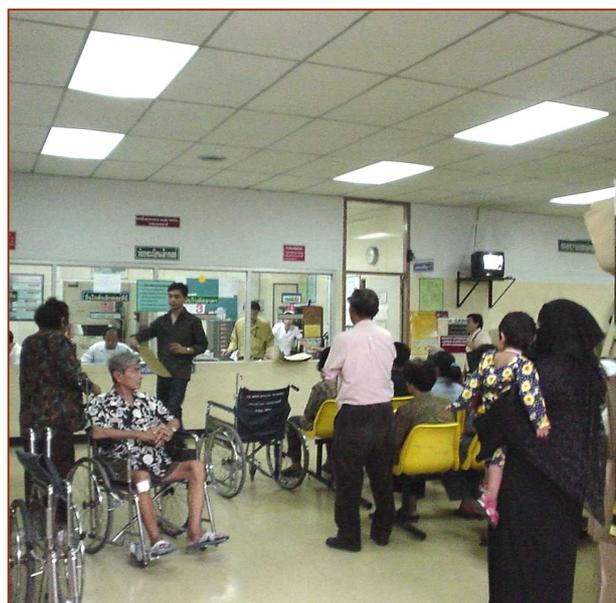
country were approved (Table 3). An average amount of loans was Baht 13,443 (US\$ 313). Approximately 73 percent of the loan seekers planned to invest in agriculture and 15 percent wanted to invest in the community commerce. Nonetheless, it is a pity that although large funds have been appropriated, no evaluation procedures are constructed to study its flaws, success and impact of the VUCF program.

Universal Healthcare Coverage (UC)

The UC or the “30 Baht Health” scheme was launched in six pilot provinces in April 2001 and another 15 provinces in June. The program was fully operational in all provinces by October 2001.

Before the initiation of the UC, most Thai families participated in some kind of free or partly subsidized public health coverage schemes. The Four main schemes—the Health Welfare for Low-Income and Disadvantaged Persons scheme, the Health Welfare for State Employees’ scheme (including the Civil Service Medical Benefit scheme), the compulsory Social Insurance scheme for private employees in medium and large firms,² and the voluntary health insurance program for the near-poor—received public support. Administrative record shows that in 2000, 33 percent of the population were holding free medical care under the Health Welfare for Low-Income and Disadvantaged Persons scheme, 11 percent under the Health Welfare for State Employees’ scheme, 10 percent under the Social Insurance scheme and 10 percent under voluntary private insurance (Viroj et al. 2002).

The free medical care for low-income and disadvantaged persons covered low-income adults, children under 12 years of age, the elderly (60 years and older),



disabled, monks, and war veterans. Low-income adults were defined as single persons with monthly income below Baht 2,000 (US\$ 47) or couples with monthly income below Baht 2,800 (US\$ 65).

However, the Socio-Economic Survey (SES) in 1999 showed that nearly a third of the poorest quintile, based on real consumption expenditure, did not report having either the low-income health insurance or the voluntary health insurance cards. Since this group was unlikely to have other forms of medical coverage, it would imply that a significant number of the poor were unprotected from the adverse effects of catastrophic illness. The 30 Baht Health scheme, then, is expected to resolve this weakness of the free medical care scheme.

Table 2 Target of the VUCF

Region	Target			Fund allocated			%
	Villages	Urban Communities	Total	Villages	Urban Communities	Total	
Central	5,691	391	6,082	5,613	273	5,886	96.78
West	5,443	270	5,713	5,434	213	5,674	98.84
East	5,177	261	5,438	5,131	239	5,370	98.75
North	15,457	416	15,873	15,325	372	15,697	98.89
South	8,336	353	8,689	8,326	335	8,661	99.68
Northeast	31,404	644	32,044	31,273	632	31,905	99.57
Bangkok	-	1,042	1,042	-	275	275	26.39
Total	71,508	3,377	74,881	71,102	2,339	73,441	98.08

Source: The VUCF National Committee (2002).

Table 3 The Principal and Interest Payment to the VUCF

Region	Fund Requisition		Principal Payment		Interest Payment	
	Persons	Million Baht	Persons	Million Baht	Persons	Million Baht
Central	331,429	4,967	162,806	558	164,683	30.40
West	363,680	5,231	178,391	604	198,096	43.69
East	333,053	4,660	194,439	535	164,955	41.27
North	1,381,410	17,597	283,179	1,506	302,189	72.43
South	674,619	8,349	468,994	1,296	379,838	93.42
Northeast	2,216,727	30,442	260,086	1,461	268,848	71.97
Bangkok	5,693	89	5,377	8	23,360	0.92
Total	5,306,611	71,335	1,553,272	5,968	1,501,969	354.10

Source: The VUCF National Committee (2002).

The 30 Baht Health scheme aims to provide equal accessibility and quality health care services to all people. Those covered by the Health Welfare for State Employees' scheme or Social Insurance scheme are not eligible for the 30 Baht Health scheme. These two schemes cover only workers in the formal sector. People under the 30 Baht Health scheme are issued a "gold card," and they can seek services from the public health care unit in their area of residence. The flat charge is 30 Baht per visit for both outpatients and inpatients.

After the introduction of the 30 Baht Health scheme, the number of outpatients has increased dramatically. In the first half of the fiscal year 2001, the outpatient rate or the average number of outpatient was 1.1 visits per person, per year for the community hospital. In the first half of the fiscal year 2002, it increased to 2.3 visits per person, per year. For provincial hospitals; the outpatient rate in 1997-2001 was 1.0-1.3 visits per person, per year, it increased to 2.5 visits per person, per year in the first half of the fiscal year 2002. Additionally, more people perceived their right to gain more medical care from public services, one of them is the right to have dental services at a cost of Baht 30. The queuing for dental services can be as long as six months to a year at various hospitals. It is interesting to note that although the dental services were free under the Health Welfare for Low-Income and Disadvantaged Persons scheme, not many patients perceived the services as accessible without charge.

Viroj et al. (2002) investigated the problems associated with the implementation of the 30 Baht Health scheme. The study showed that because of lack of information to define who are eligible for the program, gold cards were erroneously issued to those people who were covered by at least one other health care scheme. For example, some parents of state employees who were covered by the Health Welfare for State Employees' scheme also got the gold cards. The administrative data used for identifying eligibility did not contain information about people covered under the Health Welfare for State Employees' scheme. One of the reasons people like to be covered by multiple healthcare schemes stems from the fact that each healthcare scheme provides different comparable superior combination of healthcare coverage. The public hospitals are inclined to issue gold cards as much as possible to eligible people in their area, because for them the incentive mechanism is the funding they will receive from the government. Insufficient data also makes the objective of equal accessibility of the UC scheme unsuccessful, as it makes the homeless and people without birth certificate ineligible for the 30 Baht Health scheme.

One-Tambon-One-Product (OTOP) Program

"*Tambon*" means district in Thai. It consists of many villages, the smallest unit of Thai formal jurisdiction. The OTOP program encourages people in the same Tambon to develop their products

commercially by using local collective skill, knowledge, and raw materials. These products could be goods, services, or activities that range from environmental conservation, art exhibition, cultural or traditional performance to ecotourism. Each tambon, however, must represent at least one product that is unique to their region, must be high quality, and has the potential of being promoted in the international market.

The process of developing the products is expected to build social capital as people work together to improve community's economy and well being. Coordinated collective action is also expected to help the local communities to become self-reliant as supplemental income is generated from the OTOP scheme. The long term goal of the program is to develop grass roots rural economy.

The role of the government in the OTOP program is to encourage villagers to improve the quality of their products, packaging and marketing strategies. Technical support is available from the Agricultural and Fishery Products Processing Guidance Center, Marine Products Research Center, Agricultural Research Center and Agricultural Improvement Extension Center. Market for the OTOP expands through One-Tambon-One-Product Bazaar-Interaction Market, One-Tambon-One-Product Inc., One-Tambon-One-Product Movement Product Exhibition, One-Tambon-One-Product Festival, Home Town Shop, One-Tambon-One-Product Antenna Shop, through the website Thaitambon.com, and other various cooperatives network. The government's involvement at each level is as follows:

- District level: The Tambon Administration Organization (TAO) selects one product that is unique to that tambon. This product made from the local raw materials and created from local skills and knowledge, becomes the symbol of that tambon's culture and community development plan.
- County level: The County OTOP sub-committees coordinate and plan collective action by promoting production and marketing of OTOP products listed in their jurisdiction. The county sub-committees also allocate supportive budget to each Tambon.
- Provincial level: The Province OTOP sub-committees list prominent products from each county and allocate budget to the counties.
- National level: The National OTOP Committee is responsible for the national policies, strategies and master plan for the OTOP program. The committee also sets the rules and regulations for ranking of prominent products.

Since the program was launched one and a half years ago, 6,822 tambons have participated in the program. The OTOP products are classified into 14 categories: agricultural products, food, cosmetic and

health care products, garments and fabrics, furniture, toys and games, household appliances, jewelry, leather and sport products, gifts and crafts, stationery, services, product and cultural centers. Almost 60 percent of 20,970 OTOP products are gift and craft items, and 22 percent are food. An additional 1,748 products have also been promoted for e-commerce since December 2002.

People's Bank Program

The People's Bank is under the administration of the GSB. The objective of the program is to provide encouragement to people in the low-income group to invest in micro-business. Because these people cannot furnish collateral in the form of land title to the banks, they do not get qualified for loans from the formal money market or the commercial banks. The People's Bank, in contrast, only requires a voluntary individual to warrant for the loan.

Members of the People's Bank have to own a micro-business, a regular income, and be permanent residents. They can be eligible for a loan after having deposited some amount for at least two consecutive months at the GSB. After holding a GSB account for at least two months, the account holder becomes the member of the People's Bank and is eligible to make the loan request. Loans must be used to invest in micro-businesses, repay debts accrued from informal money market, or to meet basic needs and expenses. The loan amount will not exceed Baht 30,000 (US\$ 698) for first time lending, and Baht 50,000 (US\$ 1,163) for consecutive lendings. Collateral is required for loans in excess of Baht 50,000.

The interest rate charged by the People's Bank is 1 percent per month.³ The debtor's of the People's Bank pay their monthly principal and interest via the GSB field staffs. Failing to make monthly payment in a particular month, the debtor incurs a penalty of 1.5 percent of the principal payment in that month. Besides loans, the People's Bank also provides additional benefits to the members in the form of occupational training and consultancy, career development, and life insurance policy.

In August 2002, there were 537,331 members in 584 GSB branches all over the country (Table 4). Among these members, 456,735 applied for loans, but approximately 89 percent got approved. The average amount of loan was Baht 16,000 (US\$ 372) per person.

II. "THINK NEW-ACT NEW" POLICIES?

After two years of implementation of grass roots policies, it is interesting to find out if the policies have actually befitted the "Think New-Act New" agenda. At the macroeconomic perspective, the mechanisms utilized to stimulate grass roots economy are actually nothing new. Following the footsteps of the previous government, Thai Rak Thai government has used similar expansionary fiscal policies, or the Keynesian approach (Ammar 2002). However, at the micro-level, it is interesting to investigate whether the five grass roots programs are the new ways of thinking and acting.

The Debt Suspension for Farmers, the VUCF and the People's Bank programs can be grouped together as debt and credit policies. These programs have been initiated on the belief that people, especially in rural areas, do not have enough credit to invest and most farmers are in debt.

In the past, the previous governments believed that most farmers were poor and needed credits to make investments in their farms. The farmers were encouraged to borrow from the BAAC who provided agricultural credit with a lower interest rate than that of the informal money market. The BAAC loans were short term, and the farmers were required to repay their debts within a year to be eligible for new loans. The BAAC were successful in enforcing the farmers to repay their debts on schedule. One of the reasons the farmers behaved was the inducement to be able to borrow again. However, many farmers resorted to borrowing from the loan sharks in the informal money market to repay the debts owed to the BAAC. After a month of their repayment, they would get loans from the BAAC to repay the debts owed to the loan sharks. This refinancing mechanism resulted in the farmer being in the vicious circle of indebtedness. The core problem was the inability to earn enough to repay their debts. The yield at the farms was usually lower than the interest rates to be paid to the BAAC. The Debt Suspension for Farmers similarly, does not solve this root problem.

The Debt Suspension for Farmers, the VUCF and the People's Bank programs are no different from the previous government policies in the sense that the aim of all these policies is to provide loans—in other words, to put people in perpetual state of debt. The only difference is the coverage of people who can borrow. The current government is trying to let people from all walks

Table 4 Loan Approval under the People's Bank Program

Region	# of Members	# of Loan Application	Loan Approval (million Baht)
Bangkok and Vicinities	106,593	93,440	1,219
Central	107,030	83,049	1,216
North	97,675	92,044	1,433
Northeast	153,879	127,509	1,825
South	72,154	60,693	919
Total	537,331	456,735	6,612

Source: <http://www.gsb.or.th/news/news100.htm> as of August 2002.

of life be eligible for loans, not just the farmers. However, if these loans are used to consume or to invest in unproductive economic activities or in products that have no market, the borrowers will not be able to repay their debts in the long term. They then might opt for short term refinancing mechanism that the farmers used with the BAAC. In the future, the government might have to have a new grass roots policy such as “the debt suspension for people.” Ammar (1993) states that credit only plays supportive role, and will only be successful if new investment opportunities available were profitable. Therefore, the current government should think new and act new by trying to provide supports that aid in solving the core problem.

In the case of the VUCF, the government presumably acts new by letting the communities administrate their own funds. The communities decide who should get loans, how much they should get and what is the interest rate charged. This process is practically not new. The previous government used to have the Poverty Reduction Project that provided revolving fund (Baht 280,000 or US\$ 6,512) to poor villages and had similar framework like the VUCF, however, the project failed to target the poor. Those who got loans were not poor and those who were poor did not get loans. The VUCF does not have poor-targeting. As the result, every village obtains a one million Baht revolving fund.

At a participatory meeting⁴ on Poverty Reduction Implementation in December 2002, organized by the Thailand Development Research Institute (TDRI) and the Community Organizations Development Institute (CODI), the participants informed that the government rushed to the villages to set up the VUCF committees; even though some villages did not want the funding. There were some villages that had no knowledge of managing funds, and they ended up copying fund regulations from other villages. It needs to be emphasized that without viable projects for investment, if the villagers are pushed to carry money, their financial future will be in jeopardy. It was also highlighted at the meeting that the VUCF did not play a role in helping the communities to build up social capital. However in villages that people are motivated by collective actions in all likelihood will be able to manage funds better than others.

The implementation of the VUCF and OTOP is no different from other rural developmental projects. The current government wants participation of the people in the programs in order for it to be sustainable. Although these are grass roots programs, the supervision is still top-down: the national committee sets the guidelines for implementation and regulations; the provincial committees control implementation in the provinces; and the county committees control implementation in the counties. The participatory approach is hence missing since implementation is designed at the top level.

The UC or the 30 Baht Health scheme was one of the Thai Rak Thai’s political campaign that enormously caught the attention of the masses. The previous gov-

ernment had also planned the UC scheme, however, what is commendable about this government is to make it happen. It is quite obvious that former and present Thai governments have chosen to extend the number of eligible recipients for the subsidized medical care scheme.⁵ The UC appears to be a big step for public health care extension as the number of beneficiaries is almost double.⁶ The UC itself is a good program because it helps people in the low income group to cope with the consequences of health risks. However, the success of the program depends greatly upon the quality of the medical services provided.

ENDNOTES

- ¹ The exchange rate is US\$ 1 for Baht 43.
- ² In April 2002, the Social Security Office expanded Social Insurance scheme to private employees in all firmsizes.
- ³ A survey conducted by TDRI in 2001 found that the interest rate in informal money market is around 1-20 percent per month.
- ⁴ The 23 participants were from rural villages and urban communities all over the country.
- ⁵ The 30 Baht Health scheme was evolved from the Health Welfare for Low-Income and Disadvantaged Persons, which was evolved from the Public Assistance for Low-Income persons.
- ⁶ The number of people under the Health Welfare for Low-Income and Disadvantaged Persons was approximately 20 millions.

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An Analysis of Foreign Tourist Expenditure in Thailand*

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1. INTRODUCTION

Tourism industry, especially inbound, has long been recognized as an important industry to Thailand. Income from international tourists climbed from 3 percent of GDP in 1985 to almost 6 percent of GDP in 2001. Since the industry covers vast local participants, such as hotels, restaurants, and retail stores; its impact to the Thai economy is tremendous. Chalongphob, Somchai, and Yos (2002) estimate that every dollar earned from the tourism industry generates an increase of two dollars to Thailand's real GDP, this being the highest exports income multiplier. The inbound tourism revenue is targeted to increase 8 percent, or around 24,000 million baht, in fiscal year 2004. In 2000, 7.7 million tourists visited Thailand; this placed her as one of the top 20 ranked destination in the world. At regional level, Thailand ranks behind only China and Hong Kong as indicated in Table 1.

Table 1 also reveals that the spending pattern of the tourist varies at different destinations.

For Thailand, daily expenditure per tourist is relatively low while the length of stay is relatively long.

Table 2 shows that although the tourist arrival has accelerated from 1997 onward, the revenue from the tourist influx has not increased. The reason being that the tourist tends to spend less money per day with every subsequent visit. It implies that increased tourist receipts mainly come from the rising number of arrivals. This is an alarming sign because, assuming a fixed per capita cost of tourism, the increased number of tourists may result in degradation of environment and natural resources. As a result, the marginal benefit to be gained from tourist industry is on the decline. TAT (2001a) seems to acknowledge this trend. It is making attempts to entice the tourist to increase the daily expenditure by 9.3 percent, and also promote an increased length of stay so that it can be maintained at 7.86 days during 2002-2006. It is, therefore, worth investigating the factors that affect the daily spending of a tourist.

Table 1 Tourist Arrival and Receipts in Asia's Tourist Top Destinations

Country, Year	Arrivals ('000)	Receipts (millions of \$US)	Length of Stay (days)	Daily Expenditure (\$US)
China, 1999	27,047	14,098	n.a	n.a
Hong Kong, 1999	11,328	7,210	3.4	187
Thailand, 1999	8,651	6,695	8.0	97
Singapore, 1999	6,958	5,974	3.2	268
Malaysia, 1998	5,551	2,456	5.5	80
Indonesia, 1997	5,185	5,321	10.6	97
Japan, 1999	4,438	3,428	8.0	97
South Korea, 1998	4,250	5,890	4.9	283

Sources: 1. Most of figures from *Thailand in Figures, 2001-2002*, 7th ed., Alpha Research.

2. Length of stay from *Statistical Yearbook for Asia and the Pacific 2000*, United Nations.

3. Singapore and Malaysia figures from Singapore Department of Statistics.

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Table 2 Tourist Arrival and Receipts in Current US Dollars

Year	Arrivals ('000)	Receipts (million of \$US)	Length of Stay (days)	Expenditure (\$US)
1993	5,760	5,047	6.94	126
1994	6,166	5,774	6.98	134
1995	6,951	7,655	7.43	148
1996	7,244	8,657	8.23	145
1997	7,293	7,039	8.33	116
1998	7,842	5,855	8.40	89
1999	8,651	6,692	7.96	97
2000	9,578	7,112	7.77	96
2001	10,132	6,731	7.93	84

Source: Tourism Authority of Thailand (TAT).

What are the factors that affect tourist's daily expenditure? The investigation is divided on two fronts: (a) macroeconomic indicators and tourist's profile, and (b) analysis of categories on which the tourist dollar is spent. Lee, Var and Blaine (1996) used time series data of tourist generating countries, and found that income, price and exchange rate were significant in explaining expenditures of tourists visiting South Korea. Durbarry (2001) and British Tourist Authority (1998) also found income, price and exchange rate significant in explaining tourist receipts in the UK. The common finding in these papers is that tourist receipts rise along with income, and also as the value of the currency in the destination country goes down, there is a rise in the expenditure amount they spent. Perez and Sampol (2000) collected data of tourists from various countries visiting Balearic Islands, Spain in 1996. Their study focused on demographics such as age, occupation, type of accommodation, reservation, and tourists' opinions and its relationship to daily spending per head.

The second area of this study focuses on major categories on which tourists spend their money (Table 3).

Table 3 indicates that total daily expenditure has been shrinking since 1993. Of all categories, accommodation, food and beverage, and local transportation are "must pay" items for almost any tourists. Factors affecting price of these items will be discussed after the empirical investigation.

Table 3 Comparison of Tourist's Daily Spending Amount as per Categories in Thailand, in Real Thai Baht

Category	1993	2000
Accommodation	814	760
Food and Beverage	536	477
Sight Seeing	185	144
Local Transport	195	232
Shopping	1,521	1,089
Entertainment	181	326
Miscellaneous	124	113
Total	3,953	2,554

Source: Calculated from TAT.

The next section discusses an estimated model of tourist expenditure and analyzes the results (Parts 2 & 3). The declining trend of some major areas of tourists' spending is then qualitatively analyzed (Part 4). Conclusion and recommendations are outlined in the final section (Part 5).

2. MODELS

The variables postulated to affect the tourists' average daily spending are price, income, length of stay, gender, frequency of visits, and travel arrangement of tourists from various countries. These data are put together into pooled cross-section time-series. The model is

$$\ln EXP_{it} = \beta_{0i} + \beta_{1i} \ln P_{it} + \beta_{2i} \ln GDP_{it} + \beta_{3i} \ln DAYS_{it} + \beta_{4i} \ln FEM_{it} + \beta_{5i} \ln REP_{it} + \beta_{6i} \ln TARR_{it} + \beta_{7i} DASIA * \ln TARR_{it} + \beta_{7i} D97 + u_{it} \quad (1)$$

where \ln is natural logarithm, subscript it is country of origin i ($i = 1$ to 15) at time t ($t = 1985$ -2001). EXP is the expenditure/tourist/day in real Thai baht, or in real US dollar. P is relative price which will be discussed later. GDP is the gross domestic product per capita in US dollar deflated by GDP deflator. $DAYS$ is the average length of stays. FEM is the percentage of female tourists. REP is the percentage of tourists that visit Thailand more than once. $TARR$ is the percentage of tourists that came with group tour. $DASIA * \ln TARR$ is a variable that represents Asian tourists ($DASIA$) that come with group tours. This variable accounts for a striking fact that tourists from most Asian countries come with group tours with high proportion. $D97$ is a dummy variable accounted for the financial crisis in 1997 ($D97 = 1$ since 1997, and otherwise zero). u is the error term.

A proxy of price (P), as perceived by an international traveler, is either the Exchange Rate Index (EXI) or the Price Index (PI). The Exchange Rate Index is country i 's currency per Thai baht where the rate in 1995 is 100. A decrease in the index means appreciation of i 's currency with respect to Thai baht. Consequently, the cost of tourism in Thailand is lowered in the foreign currency.

As an alternative, the Price Index accounts for cost of living in Thailand perceived by traveler from each country. It is constructed as follows:

$$\text{Price Index } (PI_i) = P_{TH} / E_i^* P_i^*$$

where P_{TH} is the Consumer Price Index (CPI) of Thailand, P_i^* is CPI of country i , and E_i^* is nominal exchange rate baht per i 's currency. Similar to an increase in Exchange Rate Index, an increase in Price Index means a rising cost of tourism in Thailand perceived by visitors from that country.

Determined from the data available, the 15 countries selected are: Malaysia, Singapore, China, Hong Kong, Japan, South Korea, Taiwan, France, Germany, United Kingdom, Canada, the United States, India, Australia, and New Zealand. The GDP and price variables of all countries, except Taiwan, are taken from IMF *International Financial Statistics*. The source of Taiwan's statistics is from the website, <http://stat.gov.tw>. Data of other variables are taken from *Thailand Tourism Statistical Report 1985-1994*, and *Statistical Report 1995-2001*, published by the Tourism Authority of Thailand (TAT). It is worth noting that data of daily expenditure come from TAT annual survey at major frontier checkpoints.

As a usual starting point, data of all countries are stacked so that the ordinary least squares (OLS) estimator is employed. The least square dummy variable

(LSDV), or fixed effect, adds country dummy variables to the OLS. The null hypothesis is no country's effect. The implication of using LSDV is that all tourist-originating countries are included in the sample. To justify, tourists from countries in the sample represent 78 percent of Thailand's tourist arrivals in 2001. By relaxing the equal variance assumption and using the feasible generalized least squares (FGLS) technique, each country's variance is unequal. The null hypothesis is that each country's variance is equal.

3. ESTIMATED RESULTS

The model in (1) is tested in four combinations: expenditure is either in Thai baht or in US dollars, while the price is proximated either by the Exchange Rate Index ($LNEXI_{it}$), or the Price Index ($LNPI_{it}$). All estimates overwhelmingly reject the null hypothesis that all country dummies are equal. Therefore, LSDV is preferred to the OLS. To proceed, the likelihood ratio statistics is used to justify the null of groupwise homoskedasticity. Again, the null is rejected at 99.5 percent confidence. As a result, models are estimated with country dummy variables and groupwise heteroskedastic variance. Selected estimates are reported in Table 4.

Table 4 FGLS Estimates. Dependent Variable is the Log of Daily Expenditure per Tourist in Thai Baht (1 and 2) and US Dollar (3 and 4)

Variable	1 - baht/person/day	2 - baht/person/day	3 - \$/person/day	4 - \$/person/day
LNEXI	0.156 (0.070)**		0.215 (0.078)***	
LNPI		0.182 (0.106)*		0.264 (0.118)**
LNGDP	0.289 (0.051)***	0.289 (0.068)***	0.118 (0.062)*	0.200 (0.082)**
LNDAYS	-0.099 (0.059)*	-0.097 (0.064)	-0.176 (0.066)***	-0.209 (0.071)***
LNFEEM	0.022 (0.053)	-0.024 (0.147)	-0.022 (0.070)	-0.382 (0.172)**
LNREP	-0.136 (0.093)	-0.176 (0.101)*	-0.291 (0.108)***	-0.406 (0.118)***
LNTARR	0.267 (0.073)***	0.271 (0.074)***	0.361 (0.088)***	0.391 (0.088)***
D97	0.007 (0.031)	0.001 (0.033)	-0.493 (0.036)***	-0.475 (0.038)***
DASIA*LNTARR	-0.288 (0.102)***	-0.313 (0.107)***	-0.560 (0.118)***	-0.612 (0.126)***
R-squared	0.996	0.997	0.985	0.987
Adjusted R-squared	0.996	0.997	0.983	0.986
S.E. of regression	0.164	0.167	0.186	0.189
Log likelihood	120.52	115.67	88.84	86.43
Durbin-Watson stat	1.933	1.941	1.921	1.923
Sum squared resid	5.673	5.688	7.312	7.292

- Notes: 1) Standard errors are in parenthesis.
 2) *, **, *** indicate significant at 10%, 5%, and 1% level.
 3) Statistics in the bottom part are weighted-statistics.

The gender variable (LNFEM) is not able to explain daily expenditure in most models. Although they are marginally significant in baht models (Models 1 and 2), the length of stay (LNDDAYS) and frequency of visit (LNREP) are highly significant in dollar models (Models 3 and 4), and negatively affect daily expenditure amount. This makes sense in that tourists have more local information on where to stay, to buy, and to eat. The percentage of tourists that come with group tours (LNTARR) positively affects daily receipts with 1 percent significance level. However, Asian tourists that come with group tours (DASIA*LNTARR) tend to spend a much lesser amount on daily expenditure.

For macroeconomic indicator variables, both relative price (LNEXI and LNPI) and income per capita (LNGDP) are significant, and positively affects daily expenditure per tourist in all models. The effects of relative price variables are interesting and will be discussed shortly. The daily spending in Thai baht, Model 1 and Model 2, is not affected by the financial crisis (*D97*) at any conventional significance level. In contrast, the daily expenditure in US dollar, Model 3 and Model 4, is negatively affected by the financial crisis with 1 percent significance level. In short, the crisis influences daily expenditure in only US dollar, and not in Thai baht.

There are two findings from the estimates that are worth mentioning. First, the greater income tourists have, the more they spend per day. This result is confirmed by the positive elasticity of tourists' income with respect to daily expenditure. So, we should target high-income growth country. This conclusion is in line with most literatures, makes intuitive sense, and needs no further discussion. However, the second finding that the price coefficient is positive, may look odd at first glance. According to the law of demand, a change in relative price that raises the cost of holiday would result in a lower quantity of purchase. The price inelasticity would result in a proportional increase in expenditure. So the amount of spending moves in the same direction of the price change. That is, in Thailand international tourists' daily amount of expenditure may be inelastic to the cost of tourism because the amount is very low relative to their income. This result implies that tourists may perceive cost of tourism in Thailand to be rather cheap. They do not rigidly constrain their budgets in responding to a relative price change. There are at least two supporting facts. First, each country in the sample, except China, has a higher GDP per capita than Thailand's. Per capita GDP of Malaysia is almost twice and of the United States is 17 times that of Thailand. Second, after 1997, dollars amount of daily spending by tourist is significantly lowered while that of Thai baht is quite unchanged.

The above discussion leads to a qualitative investigation in factors influencing expenditure in three major categories, namely, accommodation, food and beverage, and local transportation.

4. MAJOR FACTORS AFFECTING TOURISM PRICES

This section discusses factors affecting price of services provided in three major categories, namely accommodation, food and beverage, and local transport. Expenditure in these categories constitutes a portion of tourist's living expense. This section investigates one or two factors in each of the three groups individually so that the reasons for decline in expenditure can be outlined.

4.1 Accommodation

Thailand has had continuous expansion in hotel construction since the early 1960s. An expansion in hotel industry was continued by the boost of the Board of Investment (BOI) since late 1960s. In the early 1970s, there were around 58 hotels, including 22 first class hotels, 13 second-class hotels, 17 third-class hotels and 6 for fourth-class hotels. In 2001, it was reported that there were approximately 2,600 hotels, 400 resorts and 800 bungalows (Nalin 2002). Regionally, the number of hotel rooms in Thailand is ranked second to that of Japan's (Figure 1). Consequently, the room rate in Thailand is considered the cheapest in South East Asia. According to the price hotel index (PHI) constructed by the World Travel and Tourist Council (WTTC), the average room rate in Thailand is \$US 99.92 per night. These rates are lower than those in comparison with Singapore, Malaysia, Hong Kong, and Japan (WTTC 2002).

In Figure 1, the graphics reflect that the boom in the hotel construction industry has put pressure on the room rates due to the surplus of hotel rooms and asymmetric information.

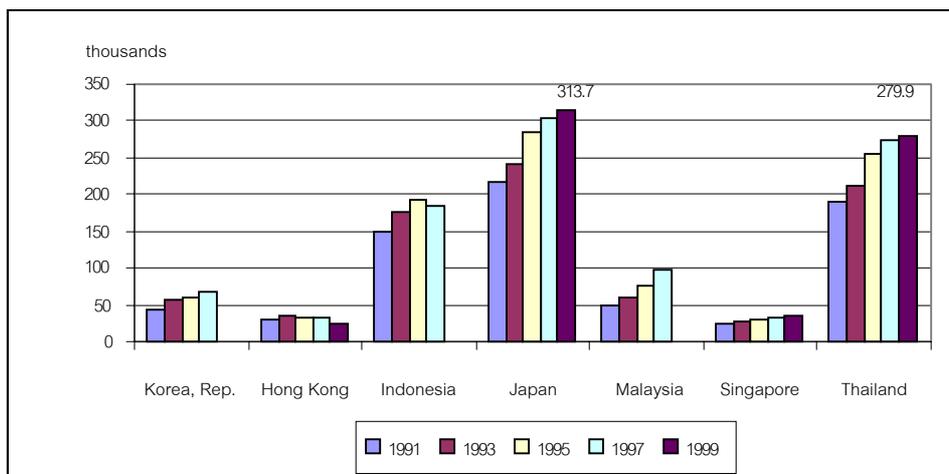
- *A surplus of hotel rooms*

As indicated in Figure 2, the hotel business was sharply growing despite the financial crisis in 1997. A disparity between number of rooms available and occupancy rates has been increasing since then. It is believed that a fast expansion of rooms constructed has killed the hotel business in Thailand, with the exception of Phuket. The TAT recorded that the average occupancy rate is around 50 percent, and it is mainly concentrated in high-class quality hotels (Table 5). For this reason, a low level of room occupancy jeopardizes the price of the overall hotel industry.

- *Asymmetric Information*

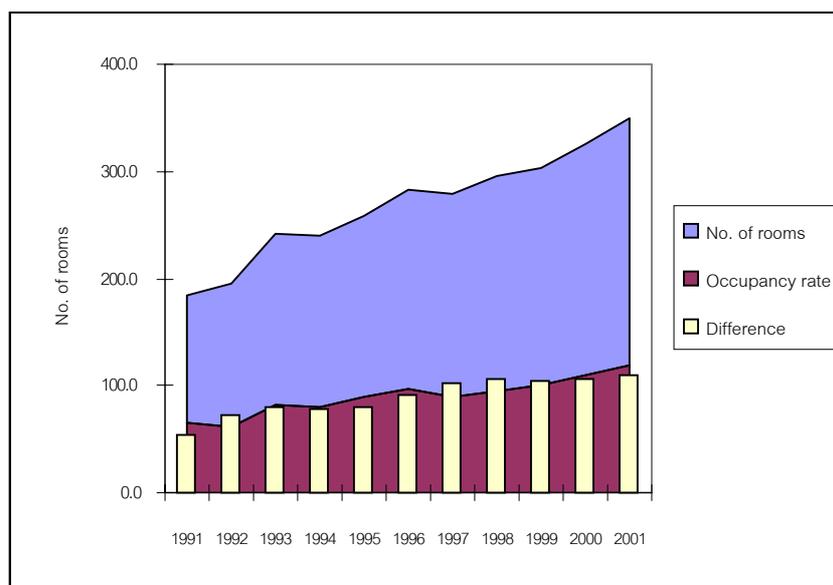
High competition causes a substantial price dampening in all hotels. But the pressure doesn't apply evenly. A major different characteristic between chain-hotel and independent hotels is the control over distribution of their information. The chains, with international and local operation, can share and effectively reduce cost of delivering information to international tourists.

Figure 1 The Number of Hotel Rooms Constructed During 1991-1999



Source: United Nations. 2002.

Figure 2 Number of Hotel Rooms and Occupancy Rates in Thailand



Source: TAT, 2001b.

Table 5 Occupancy Rate Classified by Group of Hotels

Year	Overall		1st Class Hotel		2nd Class Hotel		3rd Class Hotel	
	Total rooms	Occupancy rate (%)	Total rooms	Occupancy rate (%)	Total rooms	Occupancy rate (%)	Total rooms	Occupancy rate (%)
1997	191,287	46.58	22,848	56.86	28,613	51.28	16,973	52.08
1999	204,939	48.86	37,251	61.30	30,468	54.47	15,559	55.15
2000	215,582	50.84	40,447	64.64	28,805	56.19	15,968	55.59
2001	230,031	51.94	42,315	68.30	28,229	58.18	16,610	56.26

Notes: 1. The number of hotel rooms is based on the rooms available in 52 major travel destinations in Thailand.
 2. First class hotel: single-room rates of 2,500 Bht and upper.
 Second class hotel: single-room rates of 1,500-2,499 Bht.
 Third class hotel: single-room rates of 1,000-1,499 Bht.
 Fourth class hotel: single-room rates of 500-999 Bht.
 Fifth class hotel: single-room rates of 499 Bht and lower.

Source: TAT, various years.

Local independent hotels, including all types of local fringe operators, suffer from the compounded effects of both greater number of competitors and the problem of adequate lack of potential networks for distribution of information. They have the handicap of not being able to build the hotel's awareness among overseas tourists. The problem is accentuated among small and unknown hotels. Unless independent hotels adapt to become part of a wider group, their markets will be easily lost to the chains which are much more publicly known. Independent hotels, hence, have to hinge critically upon travel agencies who potentially act as middlemen in this market. This dependency create problems to the independent hotels as they face price exploitation by travel agents. In the event the hotel denies to offer a considerable discount, travel agents can easily switch to any other hotels that offer a more attractive price and discount.

4.2 Food and Beverage

Both macroeconomic and microeconomic factors concurrently play a key role in the food and beverage market price determination. For example, in the macro perspective, Thai baht was anchored to US dollar and the Thai government also arranged conservative monetary and fiscal policies, therefore the inflation rate in Thailand was closely related to the inflation rate in US. However, after the economic crisis in late 1990's, the domestic aggregate demand became low, which resulted in high level of excess capacity in Thai economy. All these are contributing factors that have made the cost of tourism in Thailand gradually low.

Besides the macroeconomic factors, the price of food and beverage has also been affected by two main microeconomic factors:

First, it is known that Thailand is a major food supplier to the world and aims to become the kitchen of the world. The abundant food supply, therefore, benefits the local restaurant industry as the cost of food materials is low.

Second, there are a large number of restaurants. In 2001, it is reported that there were registered 15,000 restaurants in Thailand. Of these 700 were international restaurants, 400 Thai restaurants, 1,500 fast food, 500 bakery and coffee shops, and 12,000 family-owned restaurants (Nalin 2002). The restaurants and bars are growing despite the economic crisis since they cater not only to tourists but also middle to high-income Thai businessmen. The high growth appears in areas where most tourists gather, which is mostly in Bangkok. The services offered by most of these restaurants and pubs are on par with those provided by hotel restaurants and bars, and at a considerably lower price. This results in price dampening on one hand, and improvement of services among local entrepreneurs on the other.

It is interesting to note that there are a large number of international food restaurants in Thailand. There are approximately 700 international food restaurants located in Thailand. This is due to the open investment policies of the Thai Government for foreign

investors. Moreover, the restriction on foreign workers in Thailand has become more flexible than previous policies. Nowadays, it appears that Thailand has comparatively higher number of international food restaurants, including franchised-restaurants, than many countries in the same region.

4.3 Local Transportation

Local transportation market in Thailand has also become more competitive due to the increase in the number of various types of passenger vehicles. Moreover, though the government is still a dominant business operator for domestic air services and railway services, the government, a public service provider, also plays a key role in regulating the ticket price for the benefit of people in general. All these factors explicitly contribute to the price competitiveness in Thai local transport market, thus the tourist's daily spending on local transport expenses accounts to less than 10 percent.

In Thailand, the road mode share of trips has also consistently increased. During 1984, for example, some 90 percent of regional passenger trips were accompanied by the road mode, about two-third of that total being by bus (Pacific Consultants International 1998).

Since the road mode is absolutely dominant accounting for over 90 percent of passenger trips, this phenomenon is explicitly consistent to the increasing number of registered vehicles in Thailand (see Table 6). The nation's registered vehicles, including motorcycles, grew substantially from 17.6 million in 1997 to 22.5 million in 2001. During the same period, the statistic data demonstrates that the number of registered sedan cars, taxis and buses have exhibited a high percentage change over from 1997-2001 (see Table 7). A higher number of registered vehicles in this group explicitly result in a higher competition in the local transport market leading to price dampening.

Although the statistics can well explain the higher competition in the local transport market, especially in the road mode, the total amount of tourist's daily spending has increased over time, from 195 baht in year 1993 to 232 baht in year 2000. Such increase should be attributed to the impact of higher gasoline price after the introduction of deregulation of oil price in 1991, as it was adjusted to the world price. Nipon et al. (1998) found that the sectors with heaviest use of oil products, especially diesel, land and air transportation, fishery, mining, agricultural services, and electricity generation and distribution, were most affected by the liberalization policy. The percentage share of cost of oil to total cost in these sectors ranged from 14 percent to 31 percent. Since the retail price is adjusted to the Singapore price, which is the world market price for Thailand, as a consequence, the transport operators suffer more from a gasoline price hike, as they are reliant on energy-consumption. The gasoline price increases can be, and often are, magnified by adverse baht currency depreciation, which consequently leads to an increase of operating cost (see Figure 3).

Table 6 Registered Vehicle 1997-2001

Vehicle Type	1997		1998		1999		2000		2001	
	No.('000)	%								
Sedan	1,812	10.3	1,974	10.5	2,124	10.6	2,111	10.1	2,281	10.1
Van	538	3.0	555	2.9	527	2.6	554	2.7	583	2.6
Pick-up	2,587	14.6	2,779	14.7	3,098	15.4	3,210	15.4	3,341	14.8
Taxi ⁽¹⁾	65	0.4	70	0.4	75	0.4	77	0.4	82	0.4
Tuk-Tuk	48	0.3	47	0.3	50	0.3	47	0.2	47	0.2
Bus ⁽²⁾	93	0.5	97	0.5	96	0.5	101	0.5	108	0.5
Truck ⁽³⁾	613	3.5	621	3.3	613	3.1	653	3.1	674	3.0
Other ⁽⁴⁾	257	1.5	249	1.3	266	1.3	261	1.3	236	1.0
Subtotal	6,014	34.0	6,393	33.9	6,849	34.1	7,014	33.7	7,351	32.5
Motorcycle	11,650	66.0	12,464	66.1	13,245	65.9	13,817	66.3	15,236	67.5
Total	17,664	100.0	18,857	100.0	20,094	100.0	20,831	100.0	22,587	100.0

(1) Includes motorcycle, inter-province taxi, fixed route taxi and urban taxi.

(2) Includes buses in revenue-producing operation.

(3) Includes trucks in revenue-producing operation.

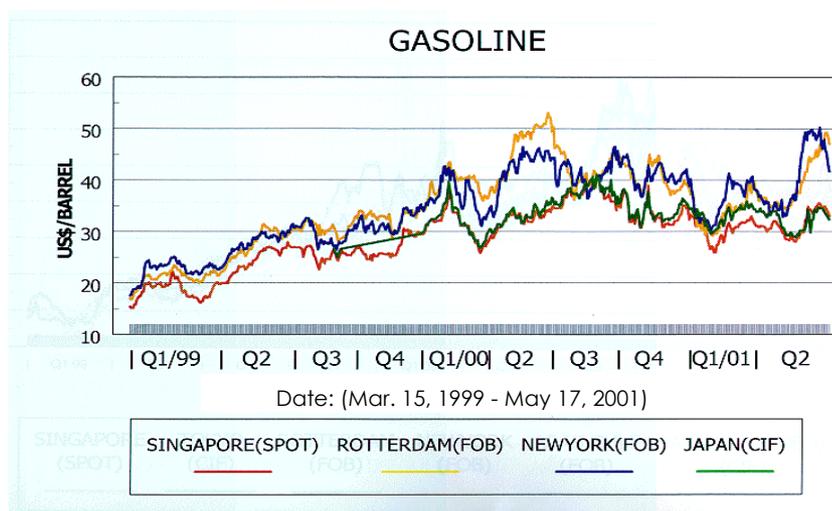
(4) Principally farm equipment.

Source: National Statistical Office.

Table 7 Percent Change of Registered Motor Vehicle

Vehicle Type	1998/1997	1999/1998	2000/1999	2001/2000
Sedan	8.9	7.6	-0.6	8.0
Van	3.1	-5.0	5.2	5.2
Pick-up	7.4	11.5	3.6	4.1
Taxi	8.1	6.5	3.4	5.7
Tuk-Tuk	-1.5	6.9	-6.4	-0.9
Bus	3.8	-0.9	5.3	6.6
Truck	1.4	-1.3	6.4	3.2
Other	-3.0	6.8	-1.8	-9.9
Subtotal	6.3	7.1	2.4	4.8
Motorcycle	7.0	6.3	4.3	10.3
Total	6.8	6.6	3.7	8.4

Source: National Statistical Office.

Figure 3 Gasoline Prices Movement (Market Comparison)

Source: NEPO, 2001.

5. CONCLUSION AND POLICY IMPLICATION

Generally, tourist arrivals seem to be a widely used as an indicator of the health of inbound tourism industry. However, the health of the industry depends not only on the number of tourist arrivals per se. The contributions to the host country are also affected by the amount the tourists' spend. Recently, the tourists' daily expenditure in Thailand, which is a direct measurement of revenue per tourist, shows a declining trend due to the falling of relative price. A possible reason is that the cost of tourism in Thailand is relatively cheap. Investigations into categories of tourist spending indicate a high competition in hotel industry, abundant supplies and proliferating restaurant industry, and cheap and competitive cost of local transportation services. The large public investment in the extensive network of roads and highways has not only provided easy access to the major tourist locations, but has also helped to reduce the traveling time and cost. Since the markets are likely to be competitive, whether it is intended or not, the government should neither worry nor adopt any intervening measures. At least, competition in the Thai tourism industry is likely to sustain the growth of total receipts in local currency. Still, government should take actions to boost tourist daily spending.

An intuitive action is to induce tourists from the high-income countries. A supplementary action comes from the finding that overseas tourists do not tightly constrain their daily expenditure while staying in the Kingdom. Given unconstrained budget, more activities, attractions should be encouraged. A policy to become a fashion hub may contribute to extra spending. Also, the One-Tambon-One-Product (OTOP) goods, which government uses as a tool to increase revenue and create job in local, especially rural community, should be promoted to the tourist. Niche markets are also worth pursuing. A plan to become an international convention center is not achieved by only adding an airport but by building a convenient transportation system. The distribution of benefits and cost of the programs should also be seriously considered. A newly introduced long-stay program may constrain medical services to the local population. In effect, any policies aimed to induce extra tourist spending should receive a careful consideration because the health of the industry depends on the net contributions of foreign tourists to the host country, not the tourist expenditure per se.

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Productivity of Rice Cropping and Irrigation in Thailand

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Pacharee Bumrungtham**

Vast sums have been invested in the construction, maintenance and rehabilitation of irrigation infrastructures in Thailand. They dominate the government's budget for agriculture. But irrigation is not only about agriculture. The advocates of irrigation projects claim supplementary benefits of hydroelectricity, flood control, fishery, tourism, among others. It will be a good thing if, to show for it all, it can be convincingly demonstrated that the mean yield of Thailand's staple crop has been raised by a significant margin under irrigation too. We look for the evidence on the ground, using data from the villages.

This paper explores the village census (NRDC)¹ database for evident changes in the mean productivity of Thailand's rice cultivation over time, and for the evident differences and shifts in the mean paddy yields of the country's major geographic regions. Further, the village profiles of the NRDC database also allow for comparisons to be made on the respective productivity in paddy cropping of villages with access to irrigation facilities, and of those with no such access. Such comparisons are pertinent to the ongoing efforts of the government to provide more surface irrigation water for paddy cropping, principally by building large dams and reservoirs. Infrastructures for irrigation have typically accounted for about 40 percent of the total budget of the Ministry of Agriculture and Cooperatives in any given year. The NRDC data on yields and access to irrigation are therefore empirically pertinent to the assumptions used in cost-benefit analysis of irrigation projects. Appraisals of such projects normally and crucially include claims of expectable increases of paddy yields when farmers switch from rain-fed practices to systematic irrigation. The assumed incremental yields—the margin of difference in outputs before and after—justify the case for investments in irrigation.

As we shall see, increases in the mean yields per unit area of paddy cropping have secularly diminished over the past decade. Returns on investments in irrigation facilities for paddy cultivation have become empirically marginal. The economic justification for capital accumu-

lation in irrigation based on expectable increases in crop yields can no longer be taken for granted. Moreover, the importance of surface water from community irrigation facilities has slipped: the existing infrastructures are now less capable of matching the delivery of water to the needs of farmers. The true performance and the real net benefits which can rightly be expected from huge outlays in budgetary resources for the provision and delivery of free irrigation water for paddy cultivation—as the system is now designed and practiced—should be thoroughly re-appraised.

PADDY PRODUCTIVITY—MEASUREMENT AND TREND

Productivity is rated by unit weight of yield per unit area of cultivation. The traditional unit weight in Thailand for paddy is *tang*, equal to 10 kilograms, and the traditional unit of cropping area is *rai*, equal to 1,600 square meters. A conversion multiplier value of 0.0625 gives the equivalent metric tons per hectare for any given *tang* per *rai* yield figure. The NRDC database of bi-annual census data spans the years from 1984 to 2001, although the chosen benchmark year for marking changes over the last decade is 1992. The chosen representative yield indicator is the median rather than the average, to allow for unvetted census data which may distort the value of the sample mean.

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Figure 1

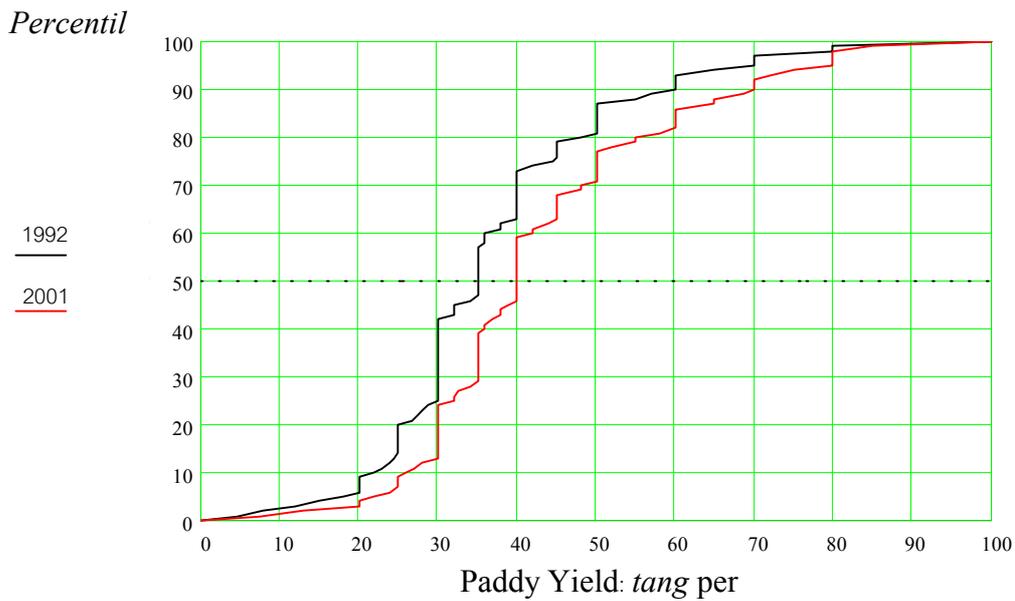
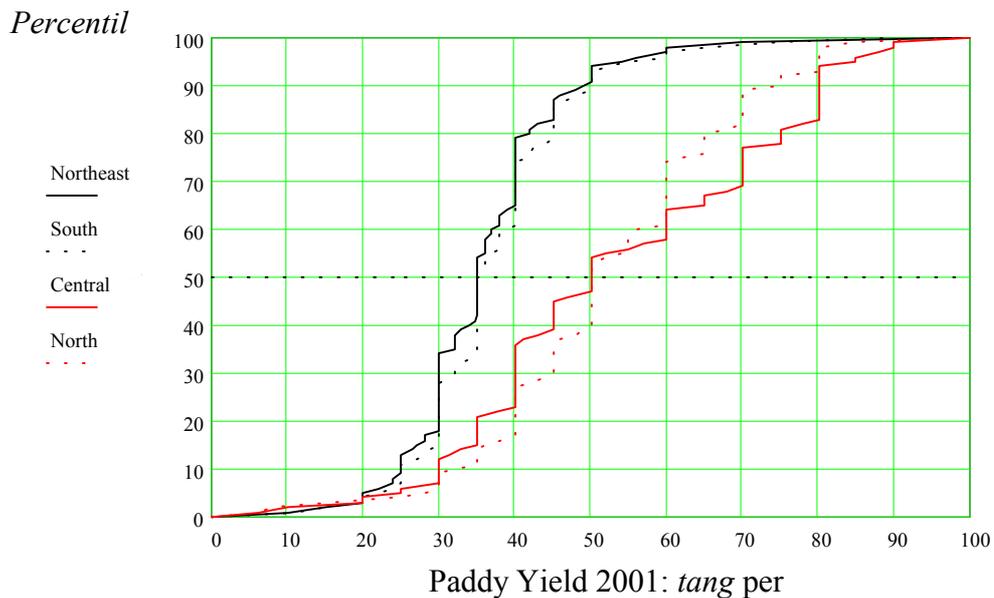


Figure 1 shows the percentiles of yields on the vertical axis plotted against *tang* weight per *rai* on the horizontal axis, from the data on typical paddy yields for the years 1992 and 2001. The rightward shift of the 2001 percentile schedule relative to the 1992 schedule in crossing the 50th percentile marker represents an increase in the median productivity of paddy cropping over the decade, from 35 to 40 *tang*—an increase of 0.3 tonnes per hectare, across the country in all villages with paddy-cropping households.

REGIONAL DIFFERENCES IN PADDY YIELD

The same set of NRDC data on paddy yields can be used to show yield differences between the main geographic regions. The paddy-producing villages in the database are classified by their area code into regional groupings. Figure 2 plots the paddy yield percentiles against productivity similarly measured in *tang* per *rai* for villages in the Central, North, Northeast and South regions in 2001.

Figure 2



As in Figure 1, the median productivity value in Figure 2 is shown to be where each region's respective percentile schedule crosses the 50th percentile marker on the vertical axis. The Central and the North regions are the more productive with equal median yields of 50 *tang* per *rai* or 3.1 tonnes per hectare, in comparison with median yields of 35 *tang* per *rai* or 2.2 tonnes per hectare for the Northeast and the South.

IRRIGATION OF PADDY-CROPPING VILLAGES

The NRDC database contains individual village profiles bearing on the physical infrastructures, provision of government services and facilities, and other characteristics which the census questionnaire—not always the same from year to year—is designed to inform. The profiles can thus be used to classify villages by selected criteria to show cross-sectional differences between different groups and different geographic areas at a point in time. Or, if questions on particular aspects or characteristics of the villages are repeatedly asked from one census year to another, the NRDC data on those observations become a time series, giving a time profile of the dynamic changes occurring between two or more census dates.

To examine the changes in paddy yield and the correlation of yields with the provision of irrigation facilities, paddy-cropping villages are grouped into those with and without 'important' surface water source from man-made reservoirs (dams or storage tanks), delivered via the main system structures (irrigation canals, weirs, dykes, or watergates). Those villages with such facilities delivering significant irrigation water resource are classified as 'irrigated'; the rest are 'non-irrigated'. From the 2001 NRDC village census data, paddy-cropping villages with irrigation facilities providing significant water resource—described inclusively as the most important and the second and third most important sources of surface water—accounted for only 17.6 percent of all the

villages. The residual 'non-irrigated' villages accounted for 82.4 percent. Out of the total number of 4.8 million paddy-cropping households in the 'irrigated' villages, only 0.85 million or 17.7 percent could be said to have significantly benefited from community irrigation infrastructures.

THE DISTRIBUTION OF PRODUCTION

Production distributions under different production regimes also indicate the relative efficiency or productivity of the regimes. The effectiveness or efficiency of irrigation will be the greater if the incremental yields can be achieved and distributed not only to raise the overall mean yield but also to reduce productive inequality among affected groups of the population.

From the NRDC village census, paddy output is given by the typical yield and cropping area of the village. Output distribution is compiled from the villages' respective outputs by kilogram weight. The population distribution is given by the number of paddy-cropping households of the respective villages.

The productivity in rice cropping is represented in Figure 3 by plotting the percentages of physical outputs on the vertical axis against the percentages of paddy-cropping households on the horizontal axis. The households are grouped into those from 'irrigated' villages and from 'non-irrigated' villages, as defined in the previous section. The paddy outputs of the two categories are plotted against the number of respective paddy-cropping households in percentage terms. The X-Y plot for each category represents output distribution among the households and their relative productivity.

The two curves in Figure 3 are production-households distributions of rice cultivation in 2001: one represents production of households in villages with irrigation infrastructures delivering significant water resource ('irrigated'), and the other of households with no community irrigation facilities ('non-irrigated').

Figure 3



There is very little difference between the two distribution schedules, although the productivity level is slightly in favor of the irrigated villages. Reading from the vertical axis, Figure 3 shows that in the irrigated villages, 74 percent of the farming households produce half the quantity of paddy output, whereas in non-irrigated villages 76 percent of the households produce half of the output. Putting it another way and reading instead from the horizontal axis, Figure 3 also shows that half the farming households in irrigated villages produce 28 percent of the output, whereas in non-irrigated villages half the households produce 27 percent of the output.

THE DECLINING IMPORTANCE OF IRRIGATION

Surprisingly, it is found that at the end of the decade a lesser number of villages—not more—chose to describe the irrigation facilities to which they had access as being ‘important’ in providing for their water needs. By the definition previously adopted, an ‘irrigated’ village with access to irrigation infrastructures and facilities must also define them as ‘important’ sources of water supply for the village. The benchmark NRDC census in 1992 marking the start of the decade showed a higher

percentage of ‘irrigated’ villages at 27.0 percent in the total number of paddy-cropping villages; and the corresponding percentage of resident paddy-cropping households with access to irrigation infrastructure was 28.5 percent of the total number of paddy-cropping households.

Both the percentages and the numbers of villages and paddy-cropping households under the ‘irrigated’ category were higher in 1992 than in 2001. The decline in importance of irrigation infrastructures as water sources for the villages that had access to them was persistent for all regions in all the census years from 1992 to 1999, the trend being only partially reversed in 2001. Over the decade, the number of paddy-cropping ‘irrigated’ villages which described their irrigation infrastructures as ‘important’ surface water sources fell, from 13,283 villages in 1992 to 9,577 villages in 2001. The numbers by category and by year are shown in Tables 1 and 2.

Table 1 shows the number and proportion of paddy-cropping villages and Table 2 the number and proportion of households classified as ‘irrigated’ or ‘non-irrigated’ from 1992 to 2001 for all regions. The numbers of villages under each classification for each year constitute the sample sizes for the yield estimates in the following section.

Table 1 Paddy-Cropping Villages

Region	Classification	1992	1994	1996	1999	2001
Central	Irrigated	3,699	3,747	3,613	2,618	2,473
	Non-Irrigated	6,548	6,386	5,845	7,330	7,884
North	Irrigated	2,852	2,532	2,374	2,076	2,306
	Non-Irrigated	7,330	7,545	7,811	9,476	9,761
Northeast	Irrigated	5,726	4,803	4,505	3,324	4,109
	Non-Irrigated	18,307	19,446	19,457	23,741	23,849
South	Irrigated	1,006	759	658	594	689
	Non-Irrigated	3,648	3,786	3,476	3,669	3,397
All Regions	Irrigated	13,283	11,841	11,150	8,612	9,577
	Non-Irrigated	35,833	37,163	36,589	44,216	44,891
Total Villages		49,116	49,004	47,739	52,828	54,468
Central	Irrigated	7.5%	7.6%	7.6%	5.0%	4.5%
	Non-Irrigated	13.3%	13.0%	12.2%	13.9%	14.5%
North	Irrigated	5.8%	5.2%	5.0%	3.9%	4.2%
	Non-Irrigated	14.9%	15.4%	16.4%	17.9%	17.9%
Northeast	Irrigated	11.7%	9.8%	9.4%	6.3%	7.5%
	Non-Irrigated	37.3%	39.7%	40.8%	44.9%	43.8%
South	Irrigated	2.0%	1.5%	1.4%	1.1%	1.3%
	Non-Irrigated	7.4%	7.7%	7.3%	6.9%	6.2%
All Regions	Irrigated	27.0%	24.2%	23.4%	16.3%	17.6%
	Non-Irrigated	73.0%	75.8%	76.6%	83.7%	82.4%
Total %		100.0%	100.0%	100.0%	100.0%	100.0%

Table 2 Paddy Cropping Households

<i>Region</i>	<i>Classification</i>	1992	1994	1996	1999	2001
Central	Irrigated	199,959	199,496	194,179	132,309	121,315
	Non-Irrigated	296,490	290,375	278,827	321,134	362,013
North	Irrigated	308,990	264,308	254,970	207,802	234,248
	Non-Irrigated	672,481	703,600	765,501	863,806	881,196
Northeast	Irrigated	577,261	489,808	486,421	339,820	435,000
	Non-Irrigated	1,706,321	1,839,643	1,947,634	2,337,259	2,438,765
South	Irrigated	88,393	66,434	57,619	53,955	60,339
	Non-Irrigated	269,257	287,981	266,844	277,800	263,929
All Regions	Irrigated	1,174,603	1,020,046	993,189	733,886	850,902
	Non-Irrigated	2,944,549	3,121,599	3,258,806	3,799,999	3,945,903
Total Households		4,119,152	4,141,645	4,251,995	4,533,885	4,796,805
<i>Central</i>	<i>Irrigated</i>	4.9%	4.8%	4.6%	2.9%	2.5%
	<i>Non-Irrigated</i>	7.2%	7.0%	6.6%	7.1%	7.5%
<i>North</i>	<i>Irrigated</i>	7.5%	6.4%	6.0%	4.6%	4.9%
	<i>Non-Irrigated</i>	16.3%	17.0%	18.0%	19.1%	18.4%
<i>Northeast</i>	<i>Irrigated</i>	14.0%	11.8%	11.4%	7.5%	9.1%
	<i>Non-Irrigated</i>	41.4%	44.4%	45.8%	51.6%	50.8%
<i>South</i>	<i>Irrigated</i>	2.1%	1.6%	1.4%	1.2%	1.3%
	<i>Non-Irrigated</i>	6.5%	7.0%	6.3%	6.1%	5.5%
<i>All Regions</i>	<i>Irrigated</i>	28.5%	24.6%	23.4%	16.2%	17.7%
	<i>Non-Irrigated</i>	71.5%	75.4%	76.6%	83.8%	82.3%
Total %		100.0%	100.0%	100.0%	100.0%	100.0%

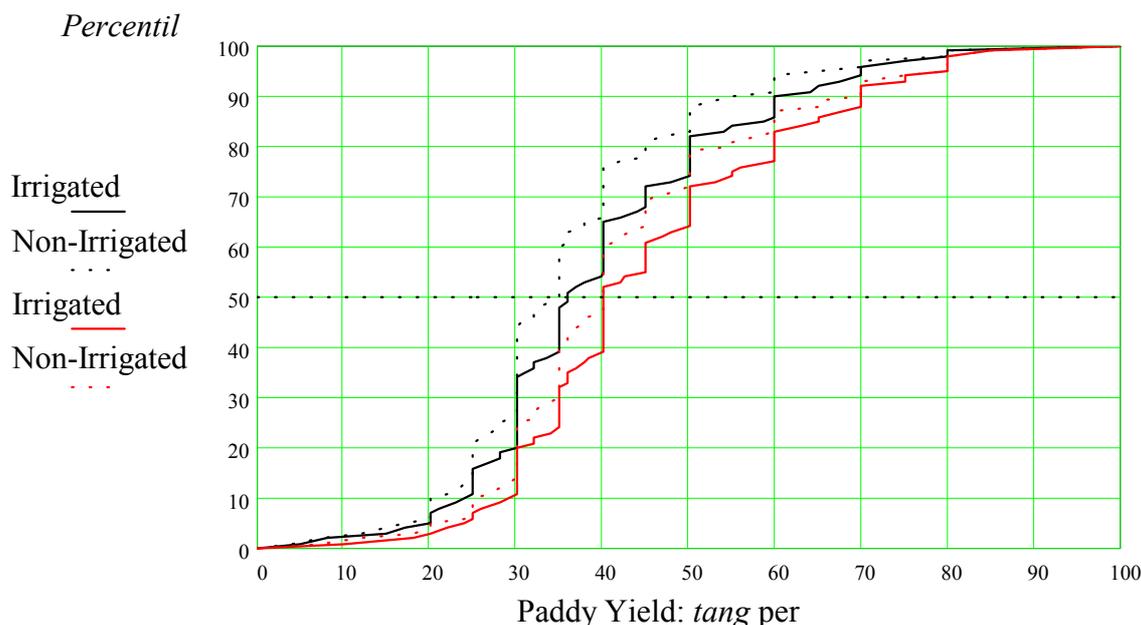
CORRELATION OF YIELD AND ACCESS TO IRRIGATION FACILITIES

Figure 4 compares the respective yields of irrigated and non-irrigated paddy-cropping villages for the years 1992 and 2001. Although the yields of irrigated villages are generally higher at other percentiles (as might be expected), the median yield of 40 *tang* per *rai* or 2.5 tonnes

per hectare is the same for both categories—irrigated and non-irrigated—in 2001. For the benchmark year of 1992, the median yield of irrigated villages is 36 *tang* per *rai* (2.3 tonnes per hectare) as against 35 (2.2 tonnes per hectare) for non-irrigated villages. The margins of difference in the median yields between the two categories by region generally increased up to 1996 but since then have diminished or vanished.



Figure 4



The data plotted in Figure 4 correspond with the median yields data shown in Table 3, which show the secular diminution of the differences in the median yields of irrigated and non-irrigated villages for all regions and for all years since 1992. The smaller the difference in the median yields of irrigated paddy-cropping over non-irrigated areas, the lesser are the marginal benefits of investments in irrigation, and the smaller the economic returns relative to the costs. To sustain government expenditures on irrigation on the condition of acceptable economic

return, the policy and design of irrigation programs will need to be re-adjusted. The aim should be to deliver better marginal performance by better delivery of water resources, and to reverse the trend in the diminishing margin of difference between the median yields of paddy in irrigated and non-irrigated areas. Under-achieving performance of the existing facilities corresponds with the declining relative importance of irrigation infrastructures as water source in the perception of the villages despite huge sums having been spent acquiring them.

Table 3 Median Paddy Productivity in Kilograms per *rai* for Villages With and Without Irrigation

Region	Classification	1992	1994	1996	1999	2001
Central	Irrigated	410	450	450	600	510
	Non-Irrigated	400	400	400	450	500
North	Irrigated	500	470	500	500	500
	Non-Irrigated	420	400	450	500	500
Northeast	Irrigated	300	300	320	350	350
	Non-Irrigated	300	300	320	350	350
South	Irrigated	350	340	350	360	360
	Non-Irrigated	320	328	350	350	350
All Regions	Irrigated	360	350	400	400	400
	Non-irrigated	350	330	350	380	400

CONCLUSION

Taking at face value the NRDC data which cover some 60,000 rural villages, the overall median paddy yield in Thailand has risen by 14.3 percent, from the benchmark year marking the beginning of the last decade of village data censuses in 1992 at 56 tonnes per hectare, to 64 tonnes per hectare in 2001. No difference in the median productivity is evident in 2001 between rice cropping with and without access to irrigation infrastructures. Regional median yields for the North and the Northeast for villages with and without irrigation facilities have stayed at the same level since 1999. In all the regions and in almost all the years since 1992, the margins of differences in the median paddy yields of villages with and without irrigation infrastructures have secularly diminished.

In the light of the empirical evidence, the policy and design with regard to community irrigation infrastructures and facilities in Thailand will need new thinking. The benefits of the government's spending to irrigate rice crops should be subject to review and be rigorously re-appraised, for cost-effectiveness and adequate return on investment.

The physical infrastructures of irrigation are popularly seen as icons of development, to help Thai rice farmers increase their productivity and income. On economic grounds, the policy goal should not be pursued at whatever costs. The evidence on the ground suggests that the presence of irrigation infrastructures and facilities in themselves do not ensure that farmers generally get the amount of water and its delivery as and when needed. The relative importance that is attached by the people to such infrastructures as had been provided by the government has diminished. Infrastructures associated with large-scale irrigation schemes are less to be relied on than in the past as dependable and systematic water sources for cropping, despite having been the over-

whelming part of the government's agricultural spending in past years.

¹ Technical Notes

NRDC is acronym for the National Rural Development Committee. The NRDC data are compiled from answers submitted to the village census questionnaire, technically known as the NRDC 2C form. The census is taken every two years beginning in 1984, but was deferred in 1998 by one year and the series was resumed in 1999. The Department of Community Development, of the Ministry of Interior, is responsible for the organization, collection, and compilation of the data which are returned by all rural villages in Thailand. All villages are technically rural if outside of urbanized municipal areas and so-called sanitary districts. The 1992 NRDC census listed 59,640 rural villages; in 2001, a total of 66,193 were listed.

A village is the smallest administrative unit of a province: the village headman represents officialdom at the local level. He sits in a committee of colleagues from neighboring villages called the *tambon* council, which represents a group of about 10 villages forming the next unit up in the administrative hierarchy. The *tambon* council is entrusted with the collective responsibility for supplying the correct information, specific to each village that the council represents, on the NRDC 2C form.

Data on rice cropping used in this paper are taken only from villages supplying full information as required by the NRDC 2C form with regard to typical yield and price, cropping area, and the number of cropping households. Community irrigation infrastructures are dams, reservoirs or storage tanks, irrigation canals, weirs, dykes, and watergates. The presence of such infrastructures are recognized only if the village identifies them as being the most important ('surface_2'), the second most important ('surface_4') or the third most important ('surface_6') surface water category for the village, which is then classified as 'irrigated'.

