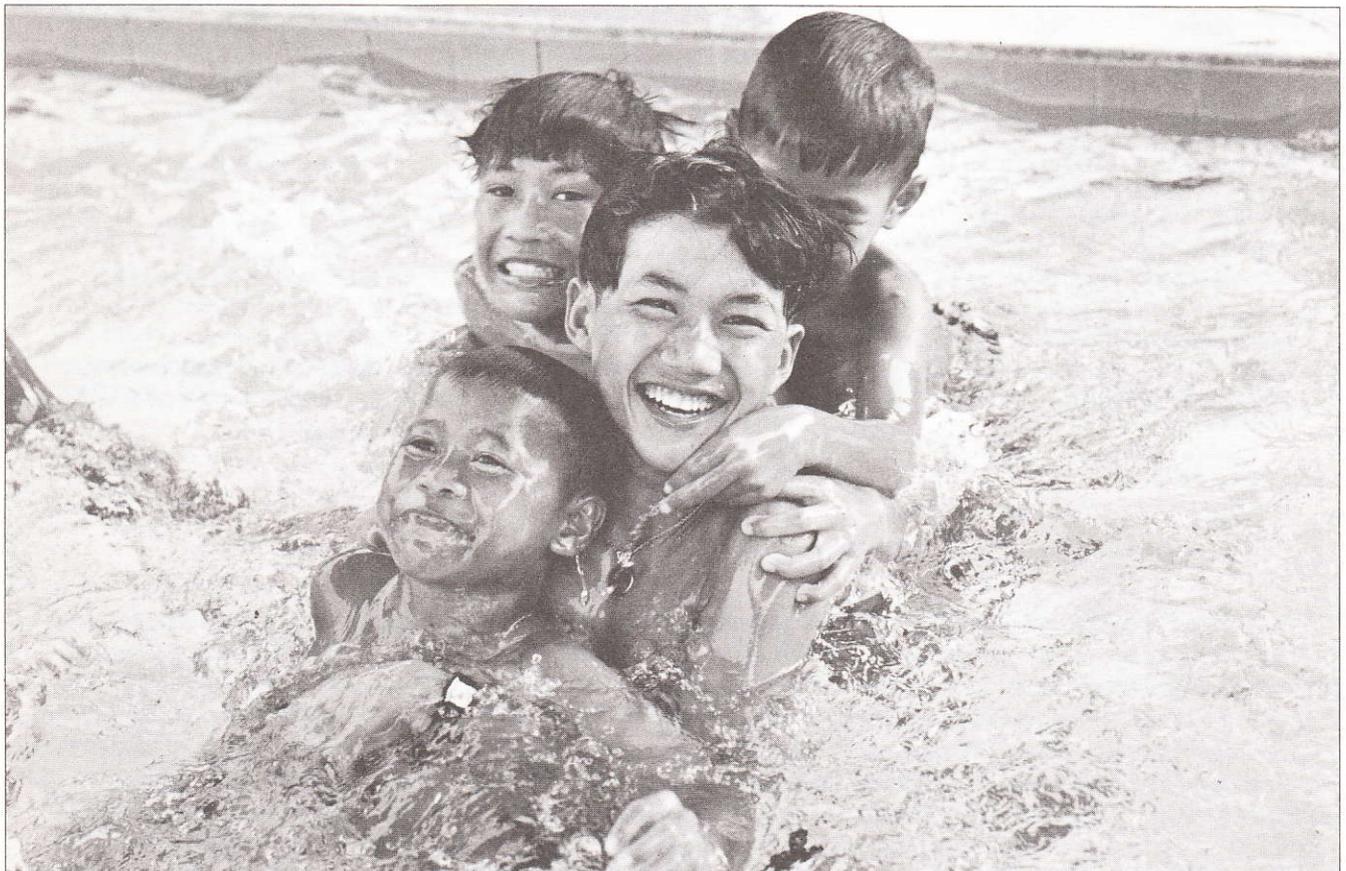


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Quarterly
Review

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These Thai youngsters take water for granted. Thai farmers can no longer afford such an innocent view (see related article on page 3).

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Institutional Problems in Water Allocation: Challenges for New Legislation¹

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Areeya Boon-long^{**}

Thailand is suffering from acute bottlenecks in the allocation of water for agricultural, industrial, and domestic consumption. In hopes of providing a solution to these problems, the National Research Council has drafted a new Water Code, which has now been put to the Cabinet for deliberation. Among other measures, the draft proposes that charges be levied, under specified conditions, on all users for the water they consume.

To be effective, new legislation must be designed with a clear understanding of the particular nature of Thailand's water problem. New legislation should also create incentives which can overcome the shortcomings of existing institutions. On the basis of our diagnostic survey of the institutional framework, the authors argue that the draft legislation in its present form is not likely to repair some of the more critical problems at hand.

DEFINING THE PROBLEM

While the demand for water rises rapidly, the institutions for managing water come under great stress. To fully appreciate the nature of that stress demands that we look beyond the economics of supply versus demand. Supply shortfalls and surges in demand have been addressed elsewhere and will not be repeated in their entirety here.² Critical to our analysis is the fact that for any group of people, water is *always* scarce. Likewise its management always requires institutions which delineate the rules and procedures for its use. It thus becomes necessary to carefully specify the *particular* supply bottlenecks that have arisen. We argue that at the root of the water problem are three fundamental stresses which will need to be resolved through institutional innovations: conflicts regarding dry season allocation, ground water depletion, and water quality problems.

Dry Season Allocation

The most visible and dramatic problem involves providing water for all users during the dry season, roughly November to May each year. This is primarily a sectoral conflict between agricultural and urban con-

sumption. The conflict is centered almost entirely on the Chao Phraya and Ta Chin river basins, which provide most of the country's water supply for irrigation and urban use. It is caused by an increase in irrigation and urban use just as the inter-temporal supply has declined.

Of the total of 33.5 billion m³ of water consumed nation-wide in 1989, agriculture used 30 billion m³, or 90 percent. Despite that astonishing figure, the main bottleneck in allocating water for agriculture comes in the dry season, when second paddy crop irrigators require about 9 billion m³. Most of the 4.5 million rai of irrigated paddy is located in the Central plain river basins, where dry season paddy now competes fiercely with urban consumers for water. Industrial and urban consumption in the Bangkok Metropolitan Region (BMR) now stands at about 3 billion m³, and at projected economic growth levels the BMR's demand could double in 10 years. An additional constraint is the Royal Irrigation Department's (RID) need for about 2.5 billion m³ per year to maintain enough flow in the Chao Phraya for flushing out waste and saline water in the lower end of the basin.

Resources to meet everyone's demands *in the dry season* have dwindled rapidly. Annual rainfall in the Chao Phraya Basin ranges from 1-1.4 billion m³ per year. Irrigators, industrialists, and domestic consumers in the Central region thus depend almost entirely upon the water stream which is released from the Bhumibol and Sirikit dams in the lower North's main river basins. With a combined capacity to store up to 23.9 billion m³ of water, it seems that these facilities would be adequate to meet the Central region's water needs for some time to come. But rapid growth in consumption further upstream in the North, the destruction of watersheds from deforestation, and recent drops in annual rainfall have reduced the yearly flow into the dams from about 11 billion m³ 10 years ago to just 7 billion in 1993 (Diagram 1). The consequence is that, with the single exception of 1979, the combined water level in the dams at the beginning of the dry season has been lower in each of the past three years than ever before (Diagram 2). Moreover, the side-flow into the Chao Phraya Basin's tributaries and irrigation canals has been reduced by

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deforestation and upland cropping on the fringes of the basin, a trend which also boosts dry-season demand for the water harnessed in the dams.

The government's typical response has been to increase the quantity of water by developing untapped resources. Demand management – meaning improving the efficiency of existing systems – has not been widely practiced. But the supply-side approach can no longer be effective as untapped resources quickly disappear. Most of the more suitable sites for dams and reservoirs have by now been used up. And future expansion of these facilities faces a steeply rising supply curve caused by higher financial, environmental, social, and political costs. As the dry season problem worsens, officials have responded with apparently the only means currently at their disposal: limit the flow of water into the Central plain's irrigation canals, and demand that dry-season paddy farmers switch to less water-intensive crops.³

Ground Water Depletion

Estimates of water use by the manufacturing sector range from 1.4 billion to 2.1 billion m^3 of water a year (1989 estimates). Of the portion of factories located in the BMR – over one-half of the total in the country, it has been estimated that only 0.5 percent of the water they consumed in 1989 was piped in from the Metropolitan Waterworks Authority (MWA).⁴ The balance was obtained from ground water pumping (95%) and other sources, such as rivers and canals (4.5%). In addition, the MWA pumped about 43.8 million m^3 in 1989, or 4.7 percent of the Authority's total production, from ground wells.

Industrialists in Bangkok and the provincial urban centers have every incentive to deplete ground water wells. The MWA and the Provincial Water Works Authorities (PWAs) in the towns cannot meet the growing urban demand. More importantly, the private cost of ground water pumping is very low – about 1-2 baht per m^3 , compared with the average piped water rate of 6 baht

per m^3 ; well water is cleaner than water pumped from rivers and canals and does not require costly treatment; and ground water pumping is monitored very poorly by the public sector. The consumption rate far outpaces the recharge rate, and the resulting costs to society are very high. Land subsidence in the eastern areas of the BMR is about 5-10 centimeters per year, contributing to billions of lost baht in flood damages.

Water Quality

While wastewater discharges increase rapidly each year, Thailand has only begun to build its capacity for sewage and wastewater management (S&WM). In nearly every municipality nation-wide, almost all waste water is discharged without any treatment at all.⁵ Currently there are four proposed treatment plants for the BMR. Even if these are constructed without delay, they will have the capacity to treat only one-fourth of the one million m^3 /day of sewage that is discharged by the BMR.

Of the key industrial wastes – biochemical oxygen demand (BOD) loading and hazardous or “toxic” wastes – there is critical need for proper treatment facilities and, more importantly, for water quality standards. The government currently lacks a data base on industrial wastewater discharges. Private estimates of only nine agro-based industries were that 525,000 tons of BOD loading were discharged in 1991. That figure is projected to double by the year 2001. A study by Engineering Science Inc. estimated there were one million tons of hazardous wastes dumped in 1989.⁶ About 71 percent of that discharge is produced by the BMR, and in 1991 production in that region alone was expected to triple by 2001. The decentralization of industry to the provinces can only make matters worse. Damages resulting from pulp factory discharges in Khon Kaen and severe BOD loading into the Nam Pong River are examples of what may well be repeated in the years to come.

Currently, the Department of Industrial Works (DIW) requires factories to install “suitable” water

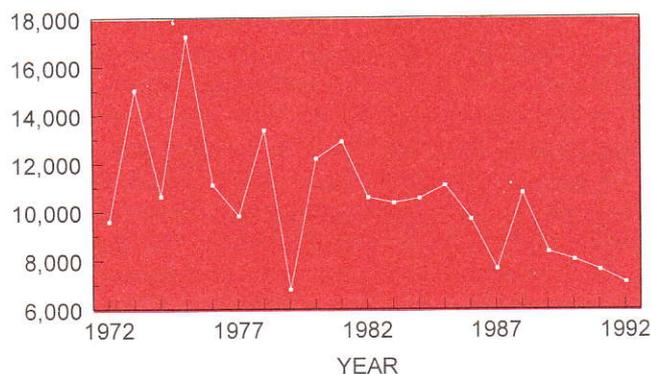


Diagram 1 Yearly Inflow into the Bhumibol and Sirikit Dams 1972-1992 (million m^3)

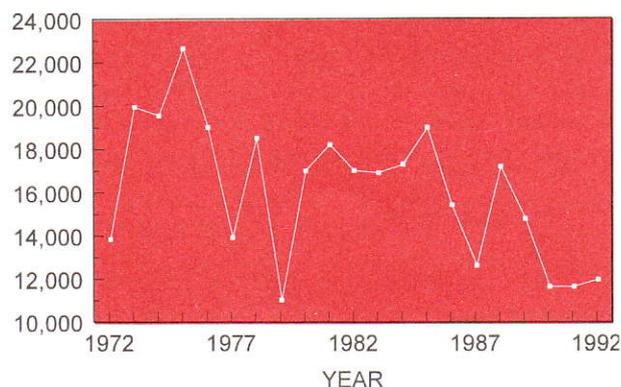


Diagram 2 November Water Level in the Bhumibol and Sirikit Dams 1972-1992 (million m^3)

Table 1 Forecast of Water Use in Thailand, 1990-2000

Year	Scale: Billion m ³ /year										
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Irrigation	30.05	30.89	31.74	32.58	33.42	34.26	35.10	35.95	36.79	37.63	38.48
Industry	1.547	1.611	1.676	1.740	1.803	1.869	1.932	1.996	2.210	2.275	2.339
Urban	1.468	1.608	1.738	1.879	2.032	2.180	2.327	2.479	2.631	2.792	2.967
Rural	.062	.062	.131	.208	.292	.383	.478	.584	.693	.813	.938

Source: United Nations.

treatment equipment and conform to effluent emission controls, but this regulation is not uniformly followed or enforced. A 1987 survey of 2,000 factories found that just over one-half were meeting the effluent controls, and that many factories lacked the necessary know-how and monitoring capacities. The larger issue is the need to establish an *environmental quality* standard. The DIW's effluent control is based arbitrarily on an emission level for each factory. It is not based on a consideration of the *ambient* level in the water stream.

DEFINING THE MANAGEMENT PROBLEM

When searching for a solution to these problems, many officials point out that rice growers are the largest consumers of water in Thailand and that they use water inefficiently. These same officials have insisted that the amount of water provided for paddy irrigation must be reduced. That response has largely failed, however, because it misses the more fundamental problem of which the farmers' wasteful consumption is a symptom, and because in any case the vast majority of paddy farmers balk at this policy.

Economists argue that the absence of a market for water leads to "rent-seeking" behavior, meaning overuse at low cost to the user. Thai agriculturalists enjoy free access to water, while urban consumers pay a fee which accounts only for the cost of processing or pumping water. The real supply and opportunity costs are borne not by individual consumers, but by society in the form of negative externalities. Correcting this market failure demands intervention by a third party – usually the state, and on occasion local or community institutions. But the lack of a coherent administrative framework can lead to fallibilities in the interventions. These failures can, in turn, reduce a society's ability to repair market failures.

Thailand is currently experiencing a number of fallibilities in its institutional capacity to cope with supply bottlenecks and market failures in water management. These fallibilities are due to the erratic design and behavior of water policy institutions, and to something we have chosen to call "institutional stress." The new legislation would have to relieve this stress if water problems are to be addressed effectively.

Erratic Institutions

The institutional landscape for water management is littered with some 30 department-level agencies under seven different ministries. Two national committees attached to the prime minister's office – the National Water Resources Committee and the National Rural Development Committee – are responsible for drafting water guidelines and coordinating these agencies. In practice, the relationships among the agencies often respond to the bottlenecks outlined earlier.

Water management agencies are not legally obligated to inform the others of their activities, and thus the existence of national committees does not guarantee coordination. Another consideration is that some agencies, e.g. the Electricity Generating Authority of Thailand (EGAT), the National Energy Administration (NEA) and the MWA, also consume water free of charge. The lack of effectively defined property rights for the agencies leads to competing claims and bottlenecks within the government itself. The key competition has occurred in the Chao Phraya Basin among the RID, EGAT, and the MWA. To date, conflicts have been resolved by assigning low priority to agriculture.⁷

The authority to charge consumers for water is provided in numerous legislative Acts. The State Irrigation Act of 1942 and its subsequent amendments allow the RID to impose a charge of up to 0.50 baht (\$0.02) per rai for irrigators, and the same charge per cubic meter of water for all other users. The Dykes and Ditches Act of 1962 and the 1974 Agricultural Land Consolidation Act authorize the RID to impose charges on land owners and other irrigators for Operations and Maintenance (O&M) and the capital costs of land improvements. The laws have proven difficult to enforce, and often their enforcement has simply not been attempted. The actual subsidy paid to farmers in the form of charges waived or deferred has depended on farmers' ability (or willingness) to pay.⁸ Moreover, water processed by the MWA and PWA is often drawn from RID canals. These agencies do not pay the RID any fees, though the water they use can reduce the quantity available for farmers.

Problems of coordination and enforcement only contribute to overuse. For example, the Ground Water

Act of 1977 introduced a one baht/m³ ground water charge. Ostensibly the charge was to account for the social cost of pumping. The Department of Mineral Resources, which oversees groundwater use, lacks the administrative capacities to issue permits and enforce this charge on industry. Moreover, the ceiling charge of one baht in real terms is equal only to one-half baht in 1977 prices. When considering the nominal piped water rate of 6.1 baht/m³ levied by the MWA in 1989, industrialists have every incentive to overuse the aquifer in the BMR.⁹

Apart from formal public sector agencies there are informal community institutions, mostly in the rural areas where they manage village-level irrigation. These institutions exist autonomously, outside the boundaries of RID projects, though there are no legal guarantees that they would be protected by the law. Should a water user or even the RID decide to divert the flow of water upstream, existing water laws provide no recourse. Many of the traditional *muang fai* (community irrigation schemes) in the Northern region have been disrupted in this fashion.¹⁰

Institutional Stress

Institutional stress occurs when the institutions for managing a resource are not adjusted to address the bottlenecks that arise as the supply of the resource declines. If the supply of institutional innovations falls short of the need to manage the supply constraint, then the level of institutional stress rises, leading possibly to increased social conflict over resource allocations.

One source of stress involves the RID. It arises from the fact that, while this agency is the primary water allocation authority, its capacity to manage water is severely limited by external and internal constraints. Historically the RID's role has been to provide water for everyone. Under that mandate the RID has very little power to dictate its policies to other government agencies. Instead it must honor the supply requests of other agencies first. These decisions have been formalized into an agreement which is struck on the eve of every dry season by EGAT, the MWA, and the RID. As the water level in the Chao Phraya Basin's dams has fallen in recent years, demand from the two former agencies has increased and the RID has been squeezed.¹¹

To mitigate conflicts, EGAT and the RID for several years have improved their coordination by having the RID submit weekly demand estimates to EGAT in the dry season. In the short term this has enabled the RID to cope with the stress caused by the refusal of paddy farmers to follow RID planting restrictions. But as the water level in the dams has declined, this method cannot address demand-side inefficiencies.

Internal organizational constraints in the RID help to limit the attention that is paid to the efficiency of the agency's services. First, for long there has been an in-

stitutional bias within the agency in favor of construction over O&M. Professional reputation is rooted firmly in construction, and the tenure security and educational backgrounds of O&M staff are generally poorer by comparison.¹² Second, because the already low user charges are not enforced, there is no connection between the revenues the RID collects and the services it provides, and hence the agency has no incentive to concern itself with the productivity of its infrastructure. Third, there is very little coordination between the RID's water allocation and the decisions of other Agriculture Ministry agencies that provide important inputs into irrigated agriculture.¹³ The result is that very little attention is paid to demand-side management of irrigation services.

A second source of stress involves emerging conflicts between upland farmers who draw from side-flow streams and farmers in the lowland areas. Many of the lowland farmers are located within the RID's irrigation projects, whereas many upland farmers have devised their own institutions to manage water allocations in their communities. As watersheds disappear in the upland areas, farmers there face greater constraints in the dry season. These constraints cannot always be mitigated by community innovations alone. Occasional RID interventions in these areas have not proven uniformly effective, as the agency is not obligated to incorporate local participation into the design of facilities, or to contribute to their maintenance. Areas where these upland-lowland conflicts occur, for example the Chiang Mai valley, require more effective third-party interventions which can balance the needs of RID irrigators with the very different needs of more autonomous community-based irrigators.

A third source of stress arises from the great need to replace industrial groundwater pumping, particularly in the BMR, with piped water services. In light of the social costs incurred by depletion of the aquifer, the government promulgated a new Groundwater Act in 1985 which mandated that pumping be phased out in the BMR by 1998. But even if we assume there will be more effective demand management through higher industrial water charges, fewer leakages, or an increase in recycling, there would still be a huge supply shortfall in the BMR. This would need to be supplemented by water from the Chao Phraya Basin, which would probably require conveyance from the MaeKlong Basin, the Mekong River, or from the Kok Basin in the North as well. A reduction in urban ground water pumping, deemed essential to avoid massive social and environmental costs, could make sectoral conflicts between agriculture and industry more acute in the Central river basins, and would most certainly create allocation conflicts *between* the Central basins and other basins upstream.

A fourth point of stress in the institutional framework involves the enforcement of water quality standards. The Environmental Act of 1991 authorizes

that ambient standards for the water stream be established. Currently the Department of Pollution Control (DPC) is creating a database on wastewater production which would provide the basis for setting those standards. Enforcement, however, would rest with the DIW. That the DPC and the DIW are located in different ministries which compete with one another over budget allocations for environmental projects does not make this achievement an easy one. Currently the Budget Bureau lacks its own information and know-how regarding water quality issues. It has not yet fully separated environmental quality control from industrial policy issues in its criteria for project approvals, and it has not always understood the need for a separate data base so long as the DIW has a legal mandate in this area.¹⁴ Furthermore, the enforcement of ambient standards will require more effective practices on the part of the key monitoring agency, the DIW. One necessary ingredient will be a professional and independent auditing system. While provided for in the new Environmental Act, such a system would rest upon the DIW's willingness to relinquish some of its authority.

THE DRAFT LEGISLATION

Shortly after the National Research Council (NRC) produced its draft Water Code, the Law Faculty of Thammasat University drafted a rival Code. Officials in the prime minister's office are now considering merging these drafts into one piece of legislation.

Institutional Adjustments Proposed

Three aspects of these drafts warrant scrutiny: the conception of property rights, the new authorities established, and the new policy instruments thus introduced.

The NRC draft does not change the "open access" nature of Thailand's water resources. It defines water as "*sombat phaendin*," which translated means "belonging to the country," but which in the civil law code provides the civil service authority to determine which user groups have ownership and utilization rights.¹⁵ The text of the draft states that every Thai has a "right" to use water so long as they do not impose any "negative effects" on other users. But it allows the civil service the authority to declare a "crisis" in the event of a shortage and thereby to charge all users according to their volume consumption. The Thammasat version is more extreme. In it all water belongs to the state (*khong rat*), and the state grants citizens the right to use but not own water.

The new administrative entities in each draft are "Basin Committees" which would oversee water allocation in some 25 major river basins. These committees would report to the National Water Resources Committee, the supreme policy-making body with regard to water. The National Committee would draft a water "plan" defining national allocation priorities in accord-

ance with Thailand's five-year development plans. Basin "sub-committees" would report to the Basin Committees about the water situation in each river basin. The Basin Committees are then empowered to declare a "water shortage zone" in the event of a supply bottleneck. In each version, the Basin Committees would coordinate all the government agencies concerned and would solicit input from user groups about how best to manage and allocate water. The Thammasat draft's committees have wider mandates, as they would prepare plans for the management of water resources within each river basin. Both drafts propose a national Water Ministry which would implement the policies of the Basin Committees. In absence of that, policy implementation would rest with the numerous existing agencies and would be coordinated by the National Committee.

The policy instruments introduced by each draft feature a water "permit." The permit would be purchased by all water users from the government. In the NRC version the permits would be issued by the Basin Committees only in the event of a water "crisis" as announced by the committee. Thammasat's version authorizes that permits be issued to *all* water users at all times. In both drafts water users may transfer and sell these permits to other users. The NRC draft authorizes that water charges be based on the local MWA or PWA rates, while the Thammasat draft does not specify how charges would be determined. An additional instrument in the Thammasat draft is a permit for wastewater discharges. That permit, too, is transferable. The NRC draft does not address water quality, leaving the issue instead to be governed by the 1991 Environmental Act.

Benefits and Drawbacks of the Draft Codes

In addition to the very large administrative costs associated with creating all of the proposed authorities, each of the drafts will leave critical institutional problems unresolved.

Property Rights: In our view, the precedent that water should be provided virtually free of charge in Thailand creates certain cultural constraints that will not be overcome easily. The NRC draft is perhaps more feasible with regard to the property rights issue than is the Thammasat version. Practices associated with water management in Thailand do not lend themselves to command and control, and thus the introduction of comprehensive permits and the enforcement of charges on everyone at once is not likely to be achieved without incurring severely high administrative and political costs. The drawback of the NRC code, however, is that it leaves the open access aspect of water virtually intact. The existing incentive structure would not change, and the enforcement of permits during "crisis" periods would thus depend on the strong administrative resolve of the state, again a significant departure from past practice. A redeeming feature of the Thammasat draft

is the creation of comprehensive property rights for wastewater. The enforcement of those rights, however, would depend on the capacity of the various committees to solicit the cooperation and compliance of the existing enforcement agencies.

Inter-basin Management: It is not clear in the NRC version whether a Basin Committee's perception of a crisis would coincide with the perceptions of water users. What is established is an entity which would serve to address the bureaucratic conflicts among existing agencies and to enforce national allocation priorities. For many users in a given basin, in particular agriculturalists, they already face supply constraints which constitute a "crisis" in their view. The draft as it stands does not specify how the Basin Committees are to distinguish among the needs of different users.

Constraints on the Basin Committees would arise from the fact that they have only limited authority in their domains. While the Basin Committees are charged with enforcing water allocation criteria, they are not entitled to the fees which would be collected should permits be issued. With only partial authority allocated to these committees, they may well lack the incentives to boost the improvement of water efficiency in a given basin. A more preferable alternative might be the creation of basin water authorities, which would have full power to manage irrigation, oversee urban consumption, and collect charges for their services in their basins. Such an authority would have an incentive to address the institutional issues which are raising the level of stress in the current framework.

Between Basins: It is striking that neither draft addresses the conflicts that would inevitably arise between basins. Presumably the various Basin Committees would be obliged to follow the country priorities laid down by the National Committee, or the Water Ministry if one is created. If so, each Basin Committee would lack the authority to sell water to another basin. This national constraint could plausibly act as an impetus for improvement in demand-side management within a basin. But given the limited authority of the Basin Committees, it is hard to imagine where the incentives to economize within a basin would arise. Improved demand-side management would require changes in irrigation practices and management of infrastructure. It would also demand that the policy enforcement problems with regard to groundwater pumping and S&WM be addressed independently of the new legislation.

CONCLUSION

Our emphasis on supply-side management serves to demonstrate that, short of significant institutional innovations in the existing water management and enforcement institutions, the introduction of any new policy instruments will not offer a solution to Thailand's water problems. While both drafts do offer various measures

that are necessary to begin addressing water problems, in themselves they are not likely to correct the many glaring government failures that are currently causing institutional stress and raising the level of conflict over water use. It would be unfortunate if the passage of any new legislation would distract from these fallibilities. Institutional reforms which could address the stresses identified above are a necessary ingredient in new legislation for changing the incentives facing water users.

ENDNOTES

- 1 This article is a preliminary summary of the Natural Resources and Environment Program's study on the institutional bases of water management in Thailand, which is supported by the United States Agency for International Development.
- 2 See Sethaputra et al., 1990.
- 3 For 1993 the RID announced it would allocate only up to 6 billion m^3 for dry season agriculture, as compared to demand of up to 9 billion m^3 , assuming all irrigated paddy areas were planted as such.
- 4 Sethaputra et al., 1990.
- 5 Unkulvasapaul and Seidel, 1991.
- 6 Ibid: 88.
- 7 Authors' interviews, Office of the Prime Minister.
- 8 Vadhanaphuti et al., 1992: 200.
- 9 Sethaputra et al., 1990.
- 10 Authors' interviews.
- 11 Authors' interviews, Office of the Prime Minister, and the RID.
- 12 RID, 1993.
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Employment Income and Education of Northern Women

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The North is Thailand's second poorest region after the Northeast. Landholdings there are also among the country's smallest. The average landholding per household in the North was only 10 acres in 1981. Although irrigation is available in some areas, making multiple cropping possible, most agricultural production is rain-fed. Thus, northern farm families cannot rely solely on income from agriculture. They must also seek off-farm employment.

Off-farm employment first gained a significant economic role in the northern rural areas in the early 1980s. A 1983 study in the Chiang Mai area found that 49 percent of total household income was derived from off-farm employment. Agricultural employment has declined in step with the shrinkage in the size of landholdings, and even middle income farm families have to seek employment off-farm. It was estimated in 1982 that household members spent more than 250 man-days in off-farm employment and fully 35 percent

of household income was derived from the non-agricultural sector.

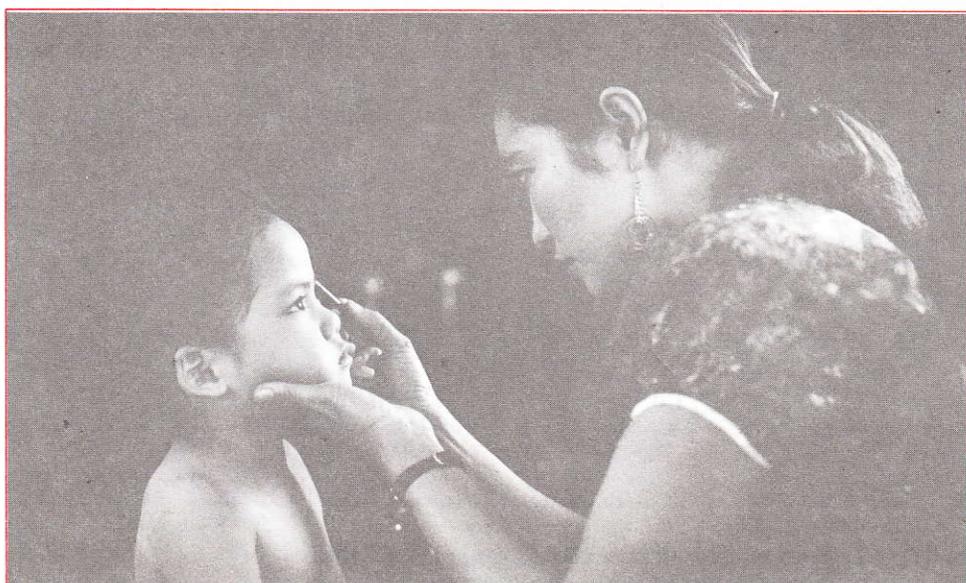
This article explores the changes in the economic opportunities for women in the rural areas of northern Thailand. Traditional employment in agriculture will first be reviewed, followed by observations on emerging trends in other sectors. Next, women's contribution to household income will be examined and, finally, educational opportunities for girls will be investigated.

EMPLOYMENT

Agricultural Employment

Among those interviewed during this survey, agriculture was the main occupation, even though some derived higher earnings from their second or third occupations. Female workers are as active as male workers

In addition to their work, modern Thai women retain their age-old role as mothers.



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in agriculture, either on their own farm or off-farm (Table 1) and, for both men and women, off-farm employment starts at an early age. An important finding was that women are not only non-paid workers on family farms but also hire out their labor to other farms (Table 1, column 4). For the age group 26-40 years, a higher proportion of women than men are engaged in paid agricultural employment.

In the Lower North villages, hired agricultural labor is common for sugarcane cutting and for the planting and harvesting of maize. In Don Rabiang, where the men are engaged in illegal logging, women are the main source of agricultural labor. Owing to relatively larger holdings in the Lower North, as compared to the Upper North, women participate equally with men in all agricultural activities, including pesticide spraying.

In the Upper North, the average holding is only one-third of a hectare. The women work in the fields mainly during the peak seasons, e.g. transplanting and harvesting. Collecting forest products is a common activity for both men and women: the young leaves of *tung* trees, used for wrapping food, are picked in early May; various types of mushroom and wild animals generate additional income from July through September.

In the Lower North, daily agricultural wages are the same for both men and women – about 30-50 baht per day. In irrigated villages, wages are higher (60 baht per day) but are the same for both men and women. Sugarcane cutting, a popular employment for hired labor, is by piece rate with the same rates applicable for men, women or even children. Fifty baht will be paid for 100

bundles of sugar cane, each bundle consisting of 10 pieces of cane. If the sugar cane has been burned, making harvesting easier, the rate drops to 40 baht per bundle.

The Upper North has more employment alternatives and wages are higher (around 60 baht/day or more), but women earn 10-20 baht less per day than men. This is because the women tend to be hired in “light” employment, e.g., weeding and grading of tobacco leaf, while men are employed for the heavier work of land clearing and preparation. In irrigated areas wages are higher, ranging from 70-80 baht a day. Hiring-out labor for cattle raising is also common. These laborers receive no cash payment, but are entitled to half of the calves produced.

In many rain-fed agricultural villages, agricultural income is insufficient to sustain the livelihood of families. Forest products are important sources of supplementary income. In one village in the Upper North, where illegal logging is commonly practiced, both men and women are engaged in transporting sawn timber. The payment is by piece rate and varies according to the distance from the illegal mill to the transporting vehicles. Men carry two or three pieces of timber at a time on their shoulders. Women, of course, are unable to carry the same amount as men and generally earn far less (100 baht per day) than men (300 baht per day). This is still much higher, however, than wages in legitimate work or agricultural employment. In another village in the Upper North, illegal lumbering is paid by lump-sum. Villagers are provided with a cash advance from a local capitalist and the remaining sum is paid when the goods are delivered.

Table 1 Employment of Members of Sample Households

(%)

Age	Agriculture						Non-farm employment								Total
	Own farm		Off-farm		Handicrafts		Manufacturing		Trade		Public services		Other		
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Female	
Below 15	1.4	1.7	2.9	2.2	1.7	0.9	-	0.8	-	3.7	-	-	1.0	2.0	19.0
15 - 20	8.3	5.6	13.1	8.3	11.2	10.5	22.7	39.5	5.8	3.7	1.1	4.1	2.0	26.3	11.5
21 - 25	8.5	9.2	8.9	9.6	14.7	9.1	36.4	28.2	5.8	8.9	8.4	9.6	22.8	24.1	11.4
26 - 30	13.9	15.4	12.8	16.6	23.3	20.9	9.1	12.9	14.6	14.2	24.7	31.5	16.3	19.8	13.1
31 - 35	15.5	17.5	15.0	20.4	12.1	20.9	9.1	8.1	15.5	17.1	23.2	30.1	16.5	11.9	12.1
36 - 40	15.4	16.8	19.5	20.1	6.0	19.5	10.6	5.6	17.5	17.1	15.8	15.1	13.3	9.3	9.8
41 - 45	7.5	10.9	8.0	8.3	5.2	8.2	3.0	1.6	3.9	12.2	9.5	4.1	9.4	3.1	5.5
46 - 50	6.7	5.6	6.1	4.8	5.2	2.7	-	1.6	12.6	6.9	7.4	4.1	2.8	1.1	3.5
51 - 55	7.8	8.1	7.0	5.4	6.0	3.6	3.0	-	8.7	8.1	5.3	-	2.4	1.1	4.2
56 - 60	7.9	5.8	4.2	4.5	6.0	3.2	1.5	-	5.8	5.7	2.6	1.4	2.1	0.8	4.2
Over 60	7.2	3.5	2.6	-	8.6	0.5	4.5	1.6	9.7	2.4	2.1	-	1.3	0.3	5.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
(Number)	(909)	(881)	(313)	(314)	(116)	(220)	(66)	(124)	(246)	(246)	(190)	(73)	(668)	(353)	(5574)

- Notes: 1. Total number of household members = 5,574.
 2. Total number of sample households = 1,050.
 3. One person may hold more than one job.

Source: Survey 1991.

Interviews with farmers revealed that the agricultural work force is aging rapidly, as the younger generation refuses to work on the farm. From 1987-1991, the high demand for labor following the boom in the construction industry, and to a lesser extent the manufacturing industry, drew many young workers away from the fields. In a secondary school in the heart of the San Pa Tong rice lands, Chiang Mai Province, not a single student chose to enroll in elective agricultural subjects. In more remote villages, intense suppression of illegal logging has forced young agricultural workers to leave their villages. At the time of our interviews in 1991, one out of every three households in Koh Thung, Lampang Province, had sent a young man to look for a job in the cities or elsewhere. In one out of five households, a young girl was working as a domestic maid in an urban area.

Our evidence suggests relatively equal opportunities for agricultural employment and payment for both men and women. Agricultural employers are more interested in output and achievement than in gender. Where tasks are specific and uniformly distributed, the day rate system of payment is often preferred. When the work load is uneven or spread over time, the piece rate system is often used. Moreover, excess demand for labor tends to equalize wages for both men and women. Hence, the wage structure is determined by the need for labor which, in turn, depends on the factors of production, i.e., land and water resources. In irrigated areas of the Lower North, for example, wages for the same task are equal for both men and women. In the Upper North, where holdings are small, women's wages are lower, as the tasks assigned are generally heavier for men than for women. The use of payment by the piece rate system is used whenever and wherever possible.

Village-based and Handicrafts Employment

Home-based activities can also be classified into three types. The first is making products for consumers in the rural areas. This is the Linder type of trade, where goods are exchanged between communities of similar taste and income. Products include household utensils, such as bamboo baskets, pots and earthenware, agricultural and hand tools, and knives. To a certain extent, these activities rely on raw materials which are relatively accessible to the villagers.

The second type of village-based manufacturing activity can be explained by the principle of relative advantage. One village will be better endowed with the resources needed to produce a particular product, whereas another village will find it cheaper to make other products. Products are then traded between communities. Products under this category include home decorations, arts and crafts, hand-made textiles, and garments.

The third type of activity is manufacturing products with the underlying advantage depending on labor rather than local raw materials. Inputs can be imported as long as they can be profitably combined with local labor and expertise.

In general, village-based activities are seasonal, lowest during the rainy season from June to October. Home-based and village-based manufacturing and handicraft activities in our sample in the Lower North tended to rely on local inputs, while those in the Upper North relied on imported inputs.

Monetary returns for village- and home-based activities cannot be accurately calculated from our large-scale survey as it used a standard questionnaire for all the sample villages. Available information on income from home-based activities in Chiang Mai, which investigated time allocation over the rainy and the dry seasons in 1991, however, suggests that daily wages from home-based activities are generally lower than from agricultural employment. Villagers who engage in home-based activities as subsidiary or part-time employment earn much less than those who make full-time employment their major occupation. The former generally earn less than 30 baht per day, the latter from 50-90 baht per day. The former group's products tend to be arts and crafts, while the latter tend to produce every-day utensils.

Villagers tend to prefer hiring out as laborers in village-based non-farm employment because of the higher wages, bringing cash to the family straight away. Handicrafts, home-made products, or village-based production, in contrast, require cash investment for acquiring raw materials. Finished goods will generally have to be stocked for some time before they are sold and there is the risk of unsold products.

Our survey shows that more women are engaged in village-based or home-based activities than men (Table 1). This is partly because the women can combine housework with home-based employment. Village-based production also helps to economize on transport and food costs. In our sample villages, home-based activities were also found in villages not classified under village-based activities. Village-based manufacturing activities do, however, tend to be more prevalent in those villages poorly endowed with agricultural resources (land and water). Products include brooms, salt, bamboo products, hand tools, and garments.

The future of village-based activities of the Linder type seems to be bleak as local resources, especially forest resources, are diminishing. The increase in rural income has tended to shift the rural household demand pattern from village-based to urban-based manufacturing. Traditional bamboo containers, for example, are being replaced by plastic containers. Home-woven fabrics are losing out to cheaper mass-produced materials. The future of the relative

advantage type of village-based manufacturing, on the other hand, depends on the labor situation.

Manufacturing Employment

The most outstanding feature of manufacturing employment in sample villages is that the manufacturing sector tends to attract a high proportion of the young workforce, especially those aged 15-20 years (Table 1). Entry into the labor market tends to be at an earlier age for females than for males in both manufacturing and other types of employment. This confirms the finding by Singhanate-Renard that girls leave school earlier than boys. This is particularly evident when job opportunities are more suitable for girls than for boys.

The difference between manufacturing and village-based employment is that the former refers to jobs in factories, where at least some mechanical or electrical process is involved, while the latter means working at home. In the Lower North, the manufacturing industries that villagers are involved in are noodle factories, brick production, furniture, bags and shoes. In the Upper North, the main industries are ceramics, furniture, food canning, garment-making and assembly of electronic components in the industrial estate at Lamphun. Factories in this industrial estate actually follow the minimum wage law and most have a social security system. Workers are required to have at least nine years education, three years beyond the six years compulsory education. They were paid about 2,200 baht a month at the time of this survey, in 1991, or about 85 baht a day.

Factories outside the industrial estate offer wages below the minimum wage and some also use the piece rate system. In ceramic bowls production, for example, the painting of bowls is paid only for every 100 bowls completed. Factories aiming at high-quality products prefer to hire labor on a daily basis.

Men and women are given different tasks in ceramic factories and their wages are, therefore, different. Men are employed where hard labor or mechanical or firing skills are required. Women are used for lighter jobs, such as jiggering, finishing and painting. Men may, however, sometimes perform the same tasks as women, such as painting, but they normally work on large objects and must be highly skilled.

Interviews with young workers in factories outside the industrial estate areas revealed that most are run by the owner and lack formal supervision. Most do not have foremen and workers' productivity varies substantially. Work-force turnover is high, but factories try to overcome this by employing more workers than needed. Many girls, especially those who work in garment factories, work very long hours, i.e., 12 hours a day starting from 8 a.m. in the morning and finishing at 5 p.m. for the first shift, with half an hour break at noon, and the second shift working from 5.30 p.m. to 9.00 p.m.



Selling food in a market is a common commercial occupation for northern women.

In Lamphang, where almost a hundred factories surround the city center, the labor market is very competitive. At the time of our interviews, the labor market was a sellers' market. Workers could easily move from one factory to another, obtaining the same pay or better. Even under this intense labor competition, however, wages paid to unskilled workers were lower than the legal minimum wage – no more than 35-45 baht per day.

More than 80 percent of this industry's work force is female, most workers starting directly after completion of compulsory education. There is no training except on-the-job. Women take maternal leave to look after their babies, but many return to work if they can leave their children with relatives.

In Lamphang, young women earn about 40 baht a day for ceramic production, only half the prevailing agricultural wage. When asked why they preferred to work in factories, rather than in the fields where wages are higher, the girls replied that factory jobs were light and year round; income was low but steady and guaranteed. Working in the fields is far too tiring and hot.

Employment in Commerce

Compared to other occupations, employment for women in the commerce sector tends to start much later in life (Table 1). Only about 16 percent of the women in this sector are 25-years-old or younger. Many women go into commerce only after they are married. Trading is generally not a full-time occupation and is supplementary to work in agriculture or in the public services.

Men are engaged in trading that involves more external and distant contacts, e.g. peddling home-made products in other villages. In the dry season, many men go to ceramic factories to buy flawed goods at wholesale prices to re-sell at a profit in remote villages. In the Upper North, men are more often found in speculative sales, e.g. making advance contracts to buy fruit prior to harvesting, etc. This type of transaction involves fairly distant travels from one village to another. Women generally prefer a fixed trading spot, e.g. in their own village or in the sub district market. Selling food, fresh or cooked, in a market is a common commercial occupation for women. In many areas of the Upper North, where women have to work in the fields with men, cooked food is usually bought from these markets and only rice is prepared at home. A relatively new trend for women in commerce is for younger girls to take jobs as sales clerks in the urban areas.

Service Employment

Unlike other employment, service employment is mostly performed outside the village and is more prevalent in villages close to town centers. The most common service employment is in the construction industry for men and as domestic help for women. Public service employment has long been the most sought after occupation for many families, but few have been able to penetrate this "lucrative" job sector. The most publicized and probably the most lucrative service occupation for village girls is in prostitution, or the so-called "entertainment industry."

Most employment in the services sector shares a common characteristic: job opportunities depend on access to an established network. This access generally arises from the migration of a village member. This, quite often, determines the pattern of employment for the whole village.

In the construction industry, the employment pattern varies from village to village. In Salachai in Lamphun, construction workers commute to work daily as their major labor market is in the provincial center. In Ban Son, Payao, the villagers work as a team and may travel to other provinces to work. These workers usually return home every two weeks, or when the family needs agricultural labor. In Don Rabiang, many young villagers have gone to Bangkok to join a construction company. Access to this particular company was established when

one villager joined the company construction site in a nearby province. Some have since decided to work with the company permanently. Others still return home during the rainy season.

Working as domestic help is a stepping stone for entering into urban employment for many young girls from the rural areas. In Ban Huad, Lamphun and Ban Kor, Lamphun, young girls work first as housemaids in their district center and then gradually move to the city center. As the girls start to feel their way around and have wider connections with the outside world, some manage to move to Bangkok and finally work in factories or as sales clerks.

Prostitution is not a widespread occupation in poverty-stricken areas but seems to occur only in villages where a "network" has been established. Among our sample villages, the Koh Thung village is one of the poorest villages but none of the girls has gone into prostitution. In Pa Eung,² which is equally poor, most of the young girls have been recruited into prostitution. In Eung Nua Village,² although the income is relatively high, many girls have also joined the entertainment profession.

Prostitution is generally not practiced in the home village, partly because the local market is small. Girls from the villages surveyed are generally sent to brothels far away from home, but the returning "veteran" prostitutes sometimes ply their trade during market days. Some take daily employment at a brothel in a nearby district center. No social sanction has been observed as many of these girls appeared to be "filial daughters," or daughters who provide income to their families.

Table 2 indicates, by age group, the number of jobs held by villagers. About 8.5 percent (104 out of 1,247) of the men held more than two jobs at a time and about 6 per cent (73 out of 1,183) of the women had two or more jobs. The proportion of women with two jobs increases markedly after the age of 30, i.e., after the normal child-bearing age. This implies not only that women return to work after their children start school but also that they have become more active in searching for work.

INCOME AND REMITTANCES

Income

Women's family pay contribution has been calculated by excluding agricultural income because allocating agricultural income by gender requires detailed time allocation analysis. It is apparent that women's contribution to household cash is on average almost half (46%) of total household income (Table 3). This was much higher than the ratios for both the Northern region and nationwide in 1988, which were 31 and 33 per cent respectively. Female contributions made up more than half the total household income in villages involved in the manufacturing and service industries.

Table 2 Percentage of Number of Jobs Held by Sex and by Age Group

Age	Number of jobs held (%)					
	not working		1 job		2 jobs or more	
	Males	Females	Males	Females	Males	Females
Lowest-14	36.5	32.2	1.3	2.2	1.0	0.0
15 - 20	11.7	9.0	10.6	15.6	10.7	12.5
21 - 25	6.6	7.7	17.6	16.0	11.7	6.9
26 - 30	8.0	9.8	17.2	19.4	14.6	8.3
31 - 35	7.8	8.7	16.4	15.9	15.5	26.4
36 - 40	5.5	6.5	13.2	13.9	23.3	22.2
41 - 45	3.0	4.8	7.7	6.1	10.7	12.5
46 - 50	2.8	2.8	5.1	3.6	3.9	2.8
51 - 55	3.6	4.7	4.8	3.6	2.9	4.2
56 - 60	5.3	5.0	3.2	3.0	2.9	2.8
61 and over	9.1	8.9	3.0	0.7	2.9	1.4
Total	100.0	100.0	100.0	100.0	100.0	100.0
(Number)	(1,379)	(1,588)	(1,247)	(1,183)	(104)	(73)

- Notes: 1. Total number of household members = 5,574.
 2. Total number of sampled households = 1,050.
 3. One person may hold more than one job.

Source: Survey 1991.

The correlation between the level of household income and the contribution of women shows a small but negative sign and is estimated at -0.036 (1-tailed significance: -0.001) for the 774 sampled households that had income-earning women. The correlation is slightly stronger (-0.054) when per capita income is considered. This confirms the hypothesis that women in lower income families tend to bear greater economic burdens than women from higher income families.

Remittances

According to our sample, 217 households receive remittances from both daughters and sons. Remittances per household from daughters average 1.7 times (169%) higher than that from sons (Table 4). Remittances from daughters account for about 28 percent of total household income and are particularly high in villages where women work in the entertainment industries. On the whole, almost one-third of the total cash income of northern rural villages comes from the remittances from female family members.

When classified by village type, it appears that, except in rain-fed agricultural villages, daughters' remittances are generally larger than sons' (Table 5). In villages with women working in the entertainment industries, the average remittance per daughter is particularly high.

Stories of "filial" children are common in rural villages but more generous support is evident when a daughter marries a foreigner. In Koh Thung, Lampang, one girl married a Swiss man and now supports the whole family of five. A woman in Ban Huad, also in Lampang, built a large house for her parents. Both women have given generous financial gifts to their local temples.

Enrollment Beyond Compulsory Education

An enrollment ratio is defined as the number of children attending school divided by the number of all children of the same age group. Thailand's enrollment ratio beyond compulsory education is among the lowest in the ASEAN group (TDRI, 1987). In 1988, it was 43.4 percent for secondary school, well below the target of 60 percent stipulated in the Sixth National Economic and Social Development Plan. There was an acute disparity between Bangkok (95%) and the provinces. In 54 provinces outside Bangkok, the ratios were below 50 percent. Official data, however, do not distinguish between the ratios for girls and that for boys.

The evidence in our sample suggests that, on average, the enrollment ratio for lower secondary education for girls aged 13-15 was slightly higher than that for boys (Table 6). The opposite is true for the upper secondary level (Table 7). Classified by type of village, enrollments tend to be lower in rain-fed agricultural villages —

Table 3 Income Contribution of Women in the Total Household Cash Income¹

Income source	Mean annual income of women (B)	No. of house holds	Share of female income in household income (%)
Home-based non-farm activities	14,274	224	39.5
- Advanced agriculture	14,970	29	34.8
- Rain-fed agriculture	10,520	10	22.7
- Industry	17,615	68	39.8
- Handicrafts	11,763	111	41.3
- Services	25,754	6	52.3
Trade	33,047	186	46.9
- Advanced agriculture	32,255	22	19.3
- Rain-fed agriculture	51,264	28	59.4
- Industry	33,874	41	50.9
- Handicrafts	20,948	32	41.3
- Services	30,836	63	50.8
Government service	60,924	30	45.0
- Advanced agriculture	60,800	3	52.5
- Rain-fed agriculture	20,530	4	25.2
- Industry	63,475	4	39.9
- Handicrafts	73,500	4	46.4
- Services	67,687	15	49.8
Other	20,338	114	36.7
- Advanced agriculture	9,003	8	20.8
- Rain-fed agriculture	11,060	8	32.6
- Industry	23,794	59	39.8
- Handicrafts	12,391	7	35.3
- Services	20,857	32	29.9
Remittances	14,049	157	28.8
- Advanced agriculture	4,770	19	26.0
- Rain-fed agriculture	8,084	54	39.6
- Industry	4,454	24	37.2
- Handicrafts	7,957	16	27.4
- Services	32,871	44	35.2
Total cash income	21,068	744	46.0
- Advanced agriculture	11,956	140	16.6
- Rain-fed agriculture	17,319	133	49.3
- Industry	24,391	181	51.9
- Handicrafts	15,723	165	45.6
- Services	34,325	155	54.6

¹ Excluding income from agriculture, but including remittance income.

the ratio drops significantly from around 53 percent for children aged 13-15 to around 19 percent for those aged 16-18. In villages where home-based employment and formal education are compatible, the enrollment ratio for girls actually exceeded that for boys at both lower and upper secondary level.

Our findings tend to support the hypothesis that enrollment ratios vary inversely with job opportunities.

In villages where manufacturing employment is available, the enrollment ratio of girls for upper secondary education is 27.8 percent, while that for boys is 42.9 percent. A similar phenomenon is observed in the service-related villages. By contrast, in advanced agricultural villages where family labor requirements remain high, the enrollment ratio for boys (40%) is noticeably lower than that for girls (48%). In handicrafts villages,

Table 4 Remittances from Household Members

(baht per household per year)

Village type	Sons		Daughters	
	Average	Cases	Average	Cases
Total Sample	8300.9	110	14049.2	157
Advanced agriculture	4650.3	24	4770.1	19
Rain-fed agriculture	12047.0	34	8048.1	54
Industry	6941.7	19	4454.1	24
Handicrafts	7718.1	11	7956.6	16
Services	7959.0	22	32870.4	44

Source: 1991 Survey.

Table 5 Remittances per Head

(baht per year)

Village type	Sons		Daughters	
	Average	Cases	Average	Cases
Total Sample	4,788.0	109	11,364.5	157
Advanced agriculture	2,364.4	24	4,098.2	54
Rain-fed agriculture	8,006.1	34	5,882.4	24
Industry	2,894.5	19	3,336.8	24
Handicrafts	4,901.6	10	5,773.6	16
Services	4,042.4	22	27,642.0	44

Source: 1991 Survey.

Table 6 Enrollment Ratio for Lower Secondary Education, Classified by Gender and Village Type

Percentage (No.)

Village Type	Enrollment ratio		
	Male	Female	Total
Advanced agriculture	53.1	65.6	59.4
Rain-fed agriculture	53.8	52.9	53.3
Industry-related	64.0	54.5	59.6
Handicrafts	57.7	73.0	65.4
Services	62.5	60.0	61.0
Total sample	57.9	61.0	59.6
Total number of children at school	(77)	(91)	(168)
Total number of children	(133)	(149)	(282)

Source: Field Survey 1991.

where much of the employment is home-based and labor is not tied to machines, handicrafts employment apparently does not affect enrollment ratios. It is, therefore, possible to conclude that there is no discrimination by gender. The opportunity cost of a child's labor seems

to be the decisive factor. This finding is also consistent with the existing social belief that investments in boys do not bring economic gain to the family as boys normally marry out. Our empirical findings, indicated earlier, also confirm that remittances from girls are usually higher.

Table 7 Enrollment Ratio for Upper Secondary Education by Gender and by Village Type (16-18 years)

Village type	Enrollment ratio		
	Males	Females	Total
Advanced agriculture	40.0	48.0	44.0
Rain-fed agriculture	19.4	18.0	18.6
Industry-related	42.9	27.8	34.8
Handicrafts	30.0	40.0	34.0
Services	42.9	32.6	36.6
Total sample	34.5	31.3	32.8
Total number of children at school	(49)	(51)	(100)
Total number of children	(142)	(163)	(305)

Source: Field Survey 1991.

CONCLUSIONS

The evidence from our large-scale survey indicates the increasing participation of rural women in Thailand's money economy. Young women (15-25 years old) tend to participate more in manufacturing activities, while older women (25-plus) tend to be self-employed as traders or engaged in home-based activities. In our sample, more women were engaged in paid agricultural work than men.

On average, women in the North now contribute almost half the total household cash income. Women's contribution by income category is particularly high in the trade sector and government service.

The study also found that northern rural economies depend to a significant extent on remittances. Comparing female to male members, female remittances were on the average 1.7 times greater than contributions from male members. In villages where household members

worked in the services industry, women remitted more to their families than men did.

As well as women's increasing economic role, data from a macro overview and our surveys suggest that access to education for girls has improved. Over the whole sample, including 35 villages in the North, the enrollment ratios for both lower and upper secondary schools tend to be affected more by employment opportunities than by gender.

ENDNOTES

- 1 This article is from a study entitled "Income, Employment and Education of Rural Women in Northern Thailand: An Investigation into a Society in Transition" funded by the International Development Research Council (IDRC). It was commissioned to Dr. Mingsarn, as team leader, while she was working as a lecturer at Chiang Mai University.
- 2 Pseudonym of a village in Chiang Rai Province.

AFTA and Foreign Direct Investment¹

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As one of the fastest growing groups of economies in the world, the Association of Southeast Asian Nations (ASEAN) has benefited greatly from extensive interaction with the international marketplace and financial markets. Accompanying the group's average 5.5 percent growth during the 1980s was an instrumental expansion of foreign direct investment (FDI) inflows. The rapid rise in capital flows following the 1985 Plaza Accord helped to stimulate ASEAN exports and to boost economic growth. Today, however, a steady source of capital is no longer assured and there is growing competition for resources from the economies in transition in Europe and Asia. The nations in Southeast Asia are being compelled to rise to the occasion.

In ASEAN, there is much hope that the formation of a free trade area (AFTA) will have a positive influence on the flows of FDI to the region. This impact, of course, will depend on the structure of AFTA, as well as the commitment of each of the participants. If a genuine free trade area in ASEAN is no more than an illusion, then its intended effects are unlikely to materialize. ASEAN cannot afford to paper over weak economic cooperation programs as it did in the past if it wants to continue attracting foreign investors to the region.

This paper examines AFTA to see if it is an illusion, or if it represents a requisite mechanism established by the ASEAN countries that may indeed stimulate the flow of FDI to the region. In doing so, we first briefly review ASEAN economic cooperation and the factors influencing the formation of AFTA. Then we examine the mechanics of AFTA and the impact that it may have on FDI in the region.

EVOLUTION OF AFTA

The founding of ASEAN in 1967 to ostensibly deepen economic interaction in the region did not result in the apparition of economic cooperation between the

five states² until the early 1980s. Yet the group's members thrived economically, thanks in large part to the stability which accompanied the ASEAN spirit. For the five countries with conflicting territorial claims and other interests,³ ASEAN has provided a peaceful backdrop to a business climate which is conducive to growth.

The 1980s witnessed the establishment of the Preferential Trading Arrangements (PTA), the ASEAN Industrial Complementation (AIC) Scheme, the ASEAN Industrial Projects (AIPs), and the ASEAN Industrial Joint Venture (AIJV) Scheme. These attempts at economic cooperation through a combination of market sharing and resource pooling mechanisms, however, were plagued by a common set of problems which limited their effectiveness. First, as a consequence of the excessive bureaucratic procedures at both the ASEAN and national levels, delays of a year or more for approvals weakened the attraction of the various schemes. Second, there was a general lack of commitment to implement these schemes. ASEAN initiatives were not followed up with thorough promotion efforts, and information was not extensively disseminated to all the parties who stood to benefit from the cooperation. Third, there was an absence of private sector involvement in the decision-making process at a regional level. Although the ASEAN Chambers of Commerce and Industry (CCI) has been active in pursuing the interests of the private sector, it has run up against the interests of national bureaucracies. Finally, a dearth of political will was the most important factor impeding genuine economic cooperation in ASEAN. Government leaders were more concerned with the costs associated with cooperation than the spillover of benefits and were, therefore, reluctant to pursue greater cooperation.⁴

One of the schemes of particular relevance to this discussion is the AIC. This mechanism was designed to stimulate intra-industry trade by liberalizing ASEAN trade in intermediate products for goods whose final

1 This paper was presented at an OECD informal workshop "OECD Foreign Direct Investment Relations with the Dynamic Non-member Economies," held in Paris, July 12-13, 1993.

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production takes place in an ASEAN country. In conceiving this scheme, the ASEAN leaders hoped to create the right conditions (e.g. a large market so that firms may gain from economies of scale) to attract FDI to the region so that such products as an ASEAN car could be developed. The AIC, however, was not championed by any party until it was modified in 1989 to incorporate an intra-firm "brand-to-brand" concept. In this form, the AIC scheme allows the private sector a larger role in determining the location of various production processes. Previously, the ASEAN governments were responsible for negotiating which processes would take place in each country. Inevitable conflicts arose over which countries would receive the higher value-added processes. Under the "brand-to-brand" variation, private automobile companies make proposals for AIC privileges (a minimum 50 percent margin of preference on tariffs) based on their own market calculations, thus dislodging many of the political rivalries involved in government-to-government negotiations.⁵

The "brand-to-brand" complementation (BBC) scheme, which is strikingly similar to a proposal made by the Ford Motor Company in 1971 (tabled because it was too ambitious at the time), illustrates the evolution of ASEAN government officials' political will to liberalize intra-ASEAN trade. Yet the BBC has, to date, been confined to the automobile sector and is not far reaching. The emergence of AFTA, therefore, must be a manifestation of the continuing evolution of the political will which first rejected the Ford proposal and later saw the establishment of BBC.

Various internal and external factors have affected this will to proceed with the free trade area. First, the emerging shape of the international economic environment is affecting the outlook of ASEAN officials *vis-a-vis* regional economic cooperation. The development of economic blocs in Europe and North America has heightened the apprehensions of ASEAN leaders over the possible diversion of trade and investment from the region. Furthermore, the delays in the completion of the Uruguay Round of talks illustrate how the international economic environment is being shaped largely by the OECD countries. As the ASEAN countries are relatively trade-dependent, they need to bolster their bargaining power to assure that their interests are not ignored. AFTA is a means not only of strengthening the cohesion of the group, but also of enhancing the dynamism of each individual economy. As the heads of state stated in the Singapore Declaration of 1992: "ASEAN shall constantly seek to safeguard its collective interests in response to the formation of large and powerful economic groupings among the developed countries, in particular through the promotion of an open international economic regime and by stimulating economic cooperation in the region." In this way, ASEAN leaders hope to show the world that they are a force to be reckoned with.

Second, ASEAN leaders have been compelled to adopt economic reforms as a result of hardships suffered from external circumstances in the 1980s. General liberalization policies, as well as the adoption of outward-oriented industrialization strategies based on multilateral trade under the GATT, have strengthened the economies in ASEAN. Cooperation within ASEAN, in the form of AFTA, is seen as a first step in the process of reducing tariff and non-tariff barriers on a most favored nation (MFN) basis. This gradualist approach allows for domestic industries to be subjected to greater competition from within ASEAN before being exposed to the rigors of the international marketplace.

Third, the growth strategies adopted by the ASEAN governments in the 1990s have been based on attracting additional FDI to the region following the apparent successes of the investments made in the 1980s. In light of the competition from Indochina, China, Eastern Europe, and Mexico for increasingly scarce capital, an effort has been made to maintain these inflows. But investment incentives are not enough to make or break investment decisions, thus AFTA was seen as a more appropriate vehicle to improve the investment environment. If it is broad-based enough, AFTA will undoubtedly be attractive to foreign investors who are looking to gain from economies of scale by producing for the region or by manufacturing truly regional products for export. Officials involved in the negotiations leading up to the summit meeting in Singapore admit that this capability of attracting foreign investment was one of the most compelling arguments for AFTA.

Finally, the introduction of international production networks is beginning to affect the way business is done in ASEAN. Technological advances, which have lowered the costs of transportation and improved the telecommunications networks, have resulted in production being based in different locations as a result of increasingly smaller cost differentials and greater efficiency. During the investment boom in the late 1980s, the ASEAN countries were exposed to these new technologies. Taking advantage of these new technologies to develop production networks can help ASEAN businesses lower their costs of production and become more competitive. The enthusiasm among foreign automobile manufacturers for the BBC scheme suggests that a more diverse production base including all six ASEAN economies will be attractive to firms producing on a global scale. A broad-based AFTA will eliminate the barriers to intra-firm trade and trade in intermediate inputs, and improve the atmosphere needed to facilitate intra-regional production networks.

The formation of AFTA, which reflects these changes, is designed to lower all barriers to intra-ASEAN trade in manufactured goods (with at least 40% ASEAN content) to a maximum of 5 percent by the year 2008. The Common Effective Preferential Tariff (CEPT)

Table 1d General Formula of Programs for Tariff Reduction (Normal Track)
(percentage, for products with tariff rates above 20%)

Country	Existing Tariff Rate	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Brunei	30	30	28	26	24	22	20	15	15	10	10	10	0-5				
Indonesia	50	50	50	50	50	50	40	30	30	20	20	20	15	15	10	10	0-5
	40	40	40	40	40	40	30	30	30	20	20	20	15	15	10	10	0-5
	30	30	30	30	30	30	20	20	20	20	20	20	15	15	10	10	0-5
	25	25	25	25	25	25	20	20	20	20	20	20	15	15	10	10	0-5
Malaysia	50	46.25	42.50	38.75	35.00	31.25	27.50	23.75	20.00			15.00		10.00		5.00	
	30	28.75	27.50	26.25	25.00	23.75	22.50	21.25	20.00			15.00		10.00		5.00	
Philippines	46-50				45	40	35	30	20	20	20	15	15	10	10	0-5	
	41-45				40	35	30	25	20	20	20	15	15	10	10	0-5	
	36-40				35	30	25	25	20	20	20	15	15	10	10	0-5	
	31-35				30	30	25	25	20	20	20	15	15	10	10	5	
	26-30				25	25	25	25	20	20	20	15	15	10	10	0-5	
	21-25				20	20	20	20	20	20	20	15	15	10	10	0-5	
Singapore	NA																
Thailand	Above 30	30	30	30	30	30	25	25	20	20	20	20	15	15	10	10	0-5
	26-30						25	25	20	20	20	20	15	15	10	10	0-5
	21-25								20	20	20	20	15	15	10	10	0-5

Source: The Ministry of Commerce, Royal Thai Government.

guaranteed to be wide enough, foreign investors who are attracted to the region would begin establishing their production bases prior to 2008, when AFTA is to be fully implemented.

While guarantees are ostensibly given by state officials, the transforming political pressures in ASEAN, particularly in Indonesia and Thailand, have cast some doubt on commitments to AFTA. The present government in Thailand, for example, is not as insulated from domestic interest groups as was the Anand interim cabinet which proposed the free trade area. In their efforts to hold a fragile coalition government together, the prime minister and his economic ministers have been susceptible to interest group politics with regard to AFTA as support from as broad a group as possible is necessary for the coalition to remain in office. Hence strong industrialists who will be adversely affected by liberalization of intra-ASEAN trade have had some successes in influencing Thailand's position on AFTA. The palm oil and petrochemical industries, for instance, have been able to attain a temporary reprieve from the unrestrained competition from their ASEAN counterparts.

The new cabinet in Indonesia raises additional concerns about this country's continued commitment to

AFTA. The new team of economic officials in which well known advocates of trade liberalization (e.g. Radius Prawiro and Johannes Sumarlin) have been replaced by individuals less inclined toward free trade could very well undermine the benefits of Indonesia's program of tariff reductions. This is not necessarily the result of local private sector pressure, however; in certain industries (e.g. textiles) the private sector is supportive of AFTA while the state enterprises call for continued protection. Nevertheless, if President Suharto's behavior over the past 25 years is any indication, when the economic circumstances dictate, the president will react expediently.⁶ And, in the case of AFTA, he is convinced of the benefits that may accrue in the form of increased (or at least sustained) flows of FDI.

A high degree of timely participation by each of the ASEAN countries will be the key to the formation of an effective AFTA which is more than a paper tiger. Two indicators available at present illustrate this level of participation: the exclusion lists and the tariff reduction schedules. A quick look at the individual exclusion lists shown in Table 2, reveals that Indonesia and the Philippines exclude the highest number of items: 1,708 and 1,179, respectively.⁷ Aside from Singapore (whose list was unavailable), Thailand has the smallest number of

Table 2 Commodities Excluded from AFTA Tariff Reductions: Fast and Normal Tracks
(Number of HS8-10 digit commodities in each HS-2 digit category)

HS Code	Description	(9 digits)		(8 digits)		(10 digits)	
		Brunei	Indonesia	Malaysia	Philippines	Singapore	Thailand
02	Meat & edible meat offal		9		51		6
03	Fish and crustaceans, molluscs, invertebrates				33		
04	Dairy products & birds eggs		24	4	12		
-----	-----	-----	-----	-----	-----	-----	-----
06	Live trees, plants; cut flowers		2		1		1
07	Edible vegetables, roots & tubers		4		10		1
08	Edible fruit & nuts, peel of citrus fruit or melon				3		
09	Coffee, tea, mate and spices		1		3		
10	Cereals				2		
11	Milled products: flour, starches, etc.		5	3	11		
14	Vegetable plaiting materials, etc.		39				
-----	-----	-----	-----	-----	-----	-----	-----
15*	Animal/vegetable fats and oils		13		32		8
16	Preparations of meat, fish, crustaceans, etc.				17		
17	Sugars & sugar confectionary		32	17	8		
18	Cocoa & cocoa preparations				9		
19	Preparations of cereal, flour, starch or milk				10		
20	Preparations of veg., fruits, nuts, etc.		5	13	28		
21	Miscellaneous edible preparations				7		
22	Beverages, spirits and vinegar		40	24	7		3
23	Wastes from food ind. for animal feed		4	1	3		
24	Tobacco & manuf. tobacco substitutes		3	6	4		8
-----	-----	-----	-----	-----	-----	-----	-----
25	Salt, sulphur, plastering mat, cement		4	2			
27*	Mineral fuels, oils, and waxes	9		30	4		
-----	-----	-----	-----	-----	-----	-----	-----
28*	Inorganic chemicals		172	22	3		
29*	Organic chemicals		178	34	35		
30	Pharmaceutical products		1		2		
31*	Fertilizers		1				
32*	Dyes, paints, varnishes, putty, etc.		43	4			
33*	Essentials, perfumery, cosmetics, toiletries	27	59		10		
34*	Soaps, lubricants, waxes, modelling pastes		18				
35*	Albuminoids, glues, enzymes		1				
36*	Explosives, pyrotechnics, matches	4	1		2		
37*	Photographic & cinematographic goods	36	10				
38*	Miscellaneous chemical products		4	1	1		
-----	-----	-----	-----	-----	-----	-----	-----
39*	Plastics & plastic articles		262	28	6		
40*	Rubber & rubber products	40	89	7	1		
-----	-----	-----	-----	-----	-----	-----	-----
41*	Raw hides, skins, and leather		60		22		
42*	Articles of leather or animal gut				6		
43*	Furskins, artificial furs, etc.		7				
-----	-----	-----	-----	-----	-----	-----	-----
44	Wood, articles of wood, wood charcoal		209	4	15		
47	Pulp, paper waste or paper-board		4				
48	Paper and paperboard, and paper articles		9	128	65		
49	Printed books, newspaper, pictures, etc.		1				
-----	-----	-----	-----	-----	-----	-----	-----
52*	Cotton		7		123		
53	Other vegetable textile fibres, paper yarn, etc.				4		
54	Man-made filaments				62		
55	Man-made fibers				98		
56*	Wadding		1		16		
57*	Carpets & other textile floor coverings				23		

(continued over)

Table 2 (Continued)

HS Code	Description	(9 digits)	(10 digits)	(9 digits)	(8 digits)	(10 digits)	
		Brunei	Indonesia	Malaysia	Philippines	Singapore	Thailand
58*	Special woven fabrics, lace, tapestries, etc.				31		
59*	Textiles suitable for industrial use		12		7		
60*	Knitted or crocheted fabrics				18		
61*	Apparel & clothing (knitted or crocheted)				96		
62*	Apparel & clothing (not knitted or crocheted)			3	97		
63*	Other textile articles				40		
64*	Footwear		1		29		
69*	Ceramic products		6		9		
70*	Glass & glassware		6		20		
71*	Gems & Jewelry				10		
72	Iron & Steel		42	113			
74*	Copper & copper articles		2				1
76	Aluminum & aluminum articles						2
82	Tools, cutlery, spoons, forks (of base metals)		10				
84	Boilers, machinery and mechanical appliances		84	28	15		
85*	Electrical machinery	146	34	9	2		30
87	Vehicles (not rolling stock), parts & accessories		181	160	55		57
90*	Optical, photographic, medical, precision instr.	90	2				
94	Furniture, etc.			5			
95	Toys, games and sports equipment			2			
96*	Miscellaneous manufactured articles		6		1		
Total exclusions at HS 8-10 digit level		352	1708	648	1179	NA	117

Source: The Ministry of Commerce, Royal Thai Government.

* Indicates fast track items

exclusions, with only 117 items listed at the HS 10-digit level. Malaysia, one of the countries taking the lead in pushing AFTA, has a surprisingly large list of 648 items. Many of these commodities, however, are subject to tariffs of only 5 percent or less. Thus Kuala Lumpur's exclusions should not have as much of a negative impact on trade liberalization under AFTA, as might be expected at first glance.

The tariff reduction schedules adopted by each of the ASEAN countries are also raising questions and concern among the private sector throughout the region. As can be seen in Tables 1a-1d, while indeed programs have been adopted for the reduction of tariffs, concrete actions generally will not take place in Indonesia, the Philippines, and Thailand for several years. In Thailand, for instance, goods in the normal track with existing tariffs between 21 and 25 percent, will not be subject to rate reductions until the end of the century. Tariffs on

normal track goods with rates presently between 26 and 30 percent will not be brought down to 25 percent until 1998, and Thailand's fast track tariff rate reductions are also delayed until 1995. Similarly, tariff reductions in the Philippines in both the fast and normal tracks will not commence until 1996. In Indonesia, tariff reductions will commence in 1995 for fast track items, and between 1996 and 1998 for normal track commodities.

These circumstances raise hazards that may affect the leading role taken by Malaysia.⁸ Malaysian businessmen have expressed concern that, by taking immediate action to lower tariff rates for intra-ASEAN trade, the Malaysian government may be placing them at a disadvantage *vis-a-vis* their Indonesian and Thai counterparts. Before they can benefit in the long run from their stronger competitiveness, these businesses must first surmount the short run competition which remains protected in other parts of ASEAN. Although

thus far it has not proven to be the case, this situation could jeopardize enthusiasm in Kuala Lumpur for AFTA if Malaysian business interests become disgruntled about what they perceive to be non-mutual sacrifices made for ASEAN.

Seen in a different light, however, the delays in Indonesia, the Philippines, and Thailand may actually ensure AFTA's success. Given the speed at which the CEPT agreement was drafted and accepted, ASEAN officials were caught off guard with respect to the impact that a free trade area may have on specific sectors. Moreover, having already accepted that certain sectors would be hurt, the ASEAN governments lacked strategies to ease the adjustment process. The buffer built into the official tariff reduction program allows time for programs of adjustment assistance to be formulated and implemented. Thailand, for example, is in the process of studying various means of assisting companies hurt by the elimination of ASEAN, to adopt more efficient production techniques or to develop new product lines. Discussions between government officials, academics, and members of the private sector have been held to consider combining a national adjustment fund with other devices, possibly a mechanism of accelerating the depreciation of capital in affected sectors. This, however, is a time-consuming process, the outcome of which would be late in coming if Thailand had already begun its tariff cuts.

The delays in tariff reductions need not necessarily be interpreted as lack of commitment to AFTA. Rather they allow the ASEAN governments more time to prepare for the cuts when they do occur, and to consolidate private sector support, thus strengthening the likelihood that backpedaling in the future will be prevented. With more credible assurances that the national governments will adhere to their set-forth plans, the business climate could become more conducive to foreign investors.

AFTA'S EFFECT ON FDI

Given that one of the *raison d'être* of AFTA is to create a large market of 330 million people with a combined GDP of over US\$300 billion, to attract foreign investment, one would expect that the national governments would create as attractive an ASEAN market as possible. In particular, the exclusion lists should reflect their strategies to attract FDI. If, however, the individual exclusion lists include many sectors which ASEAN countries want to attract investment to, then one of the primary purposes of forming the AFTA will be undermined. In this section we examine the exclusion lists to roughly see how AFTA may affect the attraction of FDI to the ASEAN countries.

First we must determine what types of investment the ASEAN countries are trying to attract. The list of activities eligible for investment promotion under

Thailand's Board of Investment (BOI) gives a good indication of the types of sectors which the ASEAN governments are targeting. These include:

- Agriculture and agricultural products
- Minerals, metals, and ceramics
- Light industry
- Manufacture of metal products, machinery, and transport equipment
- Electronics and electrical industry
- Chemical industry, paper and plastics
- Services and public utilities

Although the CEPT agreement does not include non-processed agricultural products or services, all of the other products listed here fall under the AFTA scheme.

Now we turn to the exclusion lists presented in Table 2 to see how many items in each sector are affected. This table classifies the excluded goods into their HS 2-digit classifications, with the number appearing in each column representing the number of items in each sector which are excluded. The figure above each country heading describes how detailed the exclusions are (i.e. down to the HS 9-digit level for Brunei). Finally, the asterisk (*) under each code heading indicates that this sector includes goods in the fast track.

Indonesia, Malaysia, the Philippines, and Thailand all exclude items in the manufactured agricultural products sector (HS 02-24). While the Philippines and Indonesia have the most commodities on the list, with 251 and 181, respectively, Thailand only excludes 27 items. Significantly, Indonesia, the Philippines, and Thailand each excludes a number of vegetable oils which are part of the fast track.

In the minerals and metals sector (HS 72-81), Indonesia, Malaysia, and Thailand all exclude goods. Although Malaysia excludes the most (113 items), except for a few items, tariffs on these goods range from only 2 to 4 percent. Indonesia and the Philippines each exclude several ceramic products, whose tariffs range from only 5 percent in Indonesia to 50 percent in the Philippines.

The Philippines is the primary offender in the exclusion of light industrial products from its tariff reduction program. Manila is excluding goods from each HS 2-digit textile sector (HS 52-63) except silk and wool. Footwear is also excluded, and present duties in these two broad sectors range from 10 to 50 percent. Exclusions from the other ASEAN countries are insubstantial.

Indonesia, Malaysia, and the Philippines, each exclude machinery products (HS 84). Although Indonesia excludes the largest number of goods in this sector (HS 84), the existing tariff of 71 percent (60 items) of them is zero. This may mean that NTBs are high, and Indonesia is protecting itself from the possibility of future tariffication of these NTBs.

The transport equipment sector (HS 87) interestingly is the most heavily excluded sector. Although ASEAN's BBC scheme is already directed at liberalizing trade in automobiles and automobile parts, Indonesia, Malaysia, the Philippines, and Thailand exclude 181, 160, 55, and 57 items, respectively. This accounts for 48.7 percent of all of Thailand's excluded items, and for 24.7 percent of the goods excluded by Malaysia (see Table 3). Furthermore, MFN duty rates in this sector are substantially high: 30-100 percent in Thailand, 0-300 percent in Malaysia, and 0-200 percent in Indonesia. It should be noted that under a "six-minus-X" arrangement, Indonesia does not participate in the BBC scheme.

The electronics sector (HS 85) is the one sector which has items excluded by each country. Surprisingly

Brunei, often regarded as a duty free market, excludes a wide variety of 146 items—all with MFN duties of 20 percent. Indonesia and Thailand each exclude at least 30 electronics goods from the CEPT tariff reductions. The scope of these exclusions is narrow, however, with lamps and light bulbs making up most of Thailand's exclusions, and with motors accounting for the bulk of Indonesia's electronics exclusions.

Finally, while Malaysia and the Philippines exclude items from the chemicals sector (HS 28 and 29), the Indonesians have the highest number of products on their list (350 items) accounting for 20.5 percent of their exclusions. Only 9 percent (15 of 172) of the tariffs on inorganic chemicals, however, are higher than 5 percent, and only one of these chemicals has a duty rate above 15 percent. Similarly, for the organic chemicals on

Table 3 Significant Items Excluded from AFTA

Country	Item (HS code)	% of items excluded	Range of duties (%)
Brunei	1. (85)* Electrical machinery	41.5	20
(Total of 352 items)	2. (90)* Optical, photographic, medical instruments, etc.	25.6	20
	3. (40)* Rubber & rubber products	11.4	15 - 20
	4. (37)* Photographic and cinematographic goods	10.2	20
Indonesia	1. (39)* Plastics & plastic articles	15.3	5 - 40
(Total of 1,708 items)	2. (44) Wood & Wood articles	12.2	0 - 20
	3. (87) Vehicles (not rolling stock), parts & accessories	10.6	0 - 200
	4. (29)* Organic chemicals	10.4	0 - 30
	5. (28)* Inorganic chemicals	10.1	0 - 30
Malaysia	1. (87) Vehicles (not rolling stock), parts & accessories	24.7	0 - 300
(Total of 648 items)	2. (48) Paper and Paperboard, and paper articles	19.8	nil - 20
	3. (72) Iron & Steel	17.4	2 - 35
	4. (29)* Organic chemicals	5.2	nil - 5
	5. (27)* Mineral fuels, oils, and waxes	4.6	2 - 25
Philippines	1. (52)* Cotton	10.4	10 - 30
(Total of 1,179 items)	2. (55)* Man-made fibers	8.3	16.25 - 40
	3. (62)* Apparel & clothing (not knitted or crocheted)	8.2	27.5 - 50
	4. (61)* Apparel & clothing (knitted or crocheted)	8.1	32.5 - 50
	5. (54)* Man-made filaments	5.3	19.5 - 40
Thailand	1. (87) Vehicles (not rolling stock), parts & accessories	48.7	30 - 100
(Total of 117 items)	2. (85)* Electrical machinery	25.6	30 - 60
	3. (15)* Animal/vegetable fats and oils	6.8	Baht 2.5/litre
	4. (24) Tobacco & man. tobacco substitutes	6.8	60

Source: The Ministry of Commerce, Royal Thai Government.

Indonesia's list, only 12 percent (21 of 178) of the existing tariffs are above 5 percent.

Thus, although the exclusion lists appear to be an overwhelming hindrance to the AFTA goal of attracting FDI, a closer look reveals that the affect should be small. Even in the high-technology electronics sector, the range of goods excluded is narrow enough that the sector as a whole will be subject to tariff reductions. Furthermore, the existing MFN duties on many of the goods are already low. Provided that the tariffication of NTBs for these goods is not excessively high, these exclusions will not have much significance. The one sector which will be significantly affected by almost-across the board exclusions is the automobile sector. Such exclusions will certainly mar the image of AFTA, but nevertheless, given the existing BBC scheme, their impact should be limited.

On the basis of tariff reductions, AFTA's influence on the ASEAN economies is assured to be more than illusory. Although the numerous tariff exclusions are detrimental to the designs of the founders of the free trade area, they will hardly damage it irrevocably. Uncertainty, however, does remain over the elimination of non-tariff barriers (NTBs). Although NTBs are to be addressed in the AFTA framework, with such vague wording as "member states shall eliminate all quantitative restrictions...[and] other non-tariff barriers," the CEPT agreement gives little guidance to how such an ambitious undertaking is to be achieved. Yet NTBs are a real concern as companies consider this to be the most important factor preventing intra-regional trade from expanding much in ASEAN.⁹ While the six ASEAN states are taking great strides to eliminate tariff barriers within the region, the impact of an ASEAN free trade area on FDI in the region will also depend on how the ASEAN nations handle the existing NTBs. Even so, the sentiment in the private sector is becoming increasingly positive as AFTA begins to take shape.

ENDNOTES

- ¹ This paper was presented at an OECD informal workshop, "OECD Foreign Direct Investment Relations with the Dynamic Non-member Economies," held in Paris, July 12-13, 1993.
- ² ASEAN's five founding members include Indonesia, Malaysia, the Philippines, Singapore, and Thailand. Brunei did not become a member of ASEAN until 1984.
- ³ For example, due to conflicting claims over Sabah in the 1950s, high-level officials from Malaysia have yet to travel to the Philippines for official state visits. They do attend ASEAN and other meetings in the Philippines, but refuse to recognize these trips as the official conduct of bilateral relations. Nevertheless, this has not affected the economic climate in the region.
- ⁴ See Akrasanee, Narongchai, and Stifel, David, "The Political Economy of the ASEAN Free Trade Area," in Pearl Imada and Seiji Naya, eds., *AFTA: The Way Ahead*, (Singapore: Institute of Southeast Asian Studies, 1992).
- ⁵ Political leaders nevertheless have their say in the final approval of all AIC packages.
- ⁶ Hill, Hal, "Paying the Dues," *Far Eastern Economic Review* (hereafter *FEER*), 22 April 1993, pp. 44-46. See also Vatikiotis, Michael, "Market or Mirage," *FEER*, 15 April 1993, pp. 48-50.
- ⁷ It is worth pointing out, however, that the Philippine figure (at the HS 8-digit level) understates the number of items excluded relative to the other ASEAN countries (quoted at either the HS 9- or 10-digit level). Comparisons are further complicated by the fact that there is no accepted standard 8- to 10-digit classification among the ASEAN nations.
- ⁸ Akrasanee and Stifel, op. cit. (1992).
- ⁹ Kumar, Sree, "Policy Issues and the Formation of the ASEAN Free Trade Area," in Imada and Naya, op. cit., 1992.

Strengths and Weaknesses of Railway Transport*

Human Resources and Social Development Program

FUEL EFFICIENCY

In an economy-wide context, the fuel efficiency of Thailand's transport system is an issue of some significance. As transport is an essential supporting sector for the whole economy, gains in transport fuel efficiency will lower production and distribution costs, household transport-related consumption, and also help improve the country's external trade position.

The Thai transport sector's fuel consumption has been growing by more than 10 percent annually since 1984 (Table 1). This has contributed to the high growth in fuel import after 1986, when there was a sharp downward adjustment in world oil prices (Table 2).

Table 1 Transport Sector Fuel Consumption (million liters)

	1984	1990	Av.Gr. 1984-90
High Speed Diesel	3,370	7,080	13.17%
Petrol (Regular)	1,211	1,856	7.38%
Petrol (Premium)	829	1,736	13.11%
LPG	366	205	-9.21%
Low Speed Diesel	57	88	7.51%
Fuel Oil	242	481	12.13%
Jet Fuel	1,206	2,362	11.86%
Total	7,281	13,808	11.26%
As % of National Consumption	56.2%	59.6%	—

Source: National Energy Administration; *Transport Statistics 1990*, Ministry of Transport and Communications.

In fuel efficiency, rail transport is much superior to road transport. Recently, a study sponsored by the U.S. Federal Railroad Administration into the relative fuel efficiency of truck versus railway freight operations was concluded.¹ The study's objective was to identify the circumstances in which rail freight service offers a fuel

efficiency advantage over alternative truckload options, and to estimate the fuel savings associated with using rail service. The findings were based on computer simulations of rail and truck freight movements between the same origins and destinations. The simulation input assumptions and data were based on actual rail and truck operations. Input data were provided by U.S. regional and Class I railroads and by large truck fleet operators.

The study noted that design improvements have been incorporated into successive series of locomotives, with each new model containing greater levels of fuel economy improvement. These design changes are made on an evolutionary basis and work in concert to improve overall locomotive fuel efficiency. Locomotive fuel economy improvements have been added in the areas of the engine, auxiliary systems and rail lubrication.

Table 2 Fuel Import

	Million Baht	Growth Rate
1986	29,619	—
1987	40,742	37.6%
1988	35,210	-13.6%
1989	54,709	55.4%
1990	72,427	32.4%
1991	82,502	13.9%

Source: Bank of Thailand.

Because of the many variables involved with the simulations, and the resultant "best/worse case scenarios," the study shows a wide range of savings in rail transport over road transport (Table 3). On average, however, the study shows that, in ton-miles per gallon of fuel, railways are about 4.5 times as fuel efficient when compared to trucks. If we assume the same efficiency for passenger operations, then the fuel expenditure by the State Railway of Thailand (SRT) in 1990 of 724 million baht would have cost the Thai economy an additional fuel cost of approximately 2,500 million baht had all rail transport services been carried out by road transport. It is interesting to note that this amount is greater than the current annual loss of SRT.

* This article draws from Chapter 4 of the *State Railway of Thailand (SRT) Master Development Plan Study, Final Report*, commissioned to TDRI by SRT.

Table 3 Fuel Efficiency by Equipment Type (shipments over 100 miles)

Train Type	Fuel Efficiency Range Ton-Mile/Gal.	Truck Type	Fuel Efficiency Range Ton-Mile/Gal.	Rail/Truck Ratio Range
Mixed Freight	471 - 843	Flatbed Trailer	141 - 167	2.82 - 5.51
	414 - 688	- w.o. Sides Van Trailer	131 - 163	2.96 - 5.25
Mixed Freight with Autos	279 - 499	Auto Hauler	84 - 89	3.32 - 5.61
Double Stack	243 - 350	Container Trailer	97 - 132	2.51 - 3.43
Trailer-on-Flatcar	229	Flatbed Trailer	133	1.72
	240	- w.o. Sides	147	1.63
	196 - 327	- with Sides Van Trailer	134 - 153	1.40 - 2.14
Unit Auto	206	Auto Hauler	86	2.40

Source: Federal Railroad Administration (1991), Exhibit S-4.

ENVIRONMENTAL CONSIDERATIONS

Environmental considerations also favor rail over road transport. Given the superior fuel efficiency of rail transport, emissions of harmful gases from fuel usage will obviously be less per unit of output for rail compared to road transport. Some numbers from Sweden, which has integrated environmental concerns into its transport pricing policy through environmental charges, illustrate the difference.²

In 1990, the Swedish Commission on Economic Instruments in Environmental Policy proposed the following pollution charges:

Sulfur (SO ₂)	\$ 5.25/kg
Nitrogen Oxides (NO _x)	\$ 7.00/kg
Hydrocarbon (HC)	\$ 3.50/kg
Carbon Dioxide (CO ₂)	\$ 0.04/kg

Using these "price tags" as weights, 45 percent of total SO₂, NO_x, HC, and CO₂ emissions in Sweden originate from the transport sector. Taking the traffic level in 1990, and the above proposed charges, the cost responsibilities for the Swedish transport sector's various subsectors are as follows:

Road	\$ 16,300	Million
Maritime	\$ 2,600	"
Aviation	\$ 900	"
Rail	\$ 60	"

Thus the emission costs for road are more than 270 times that for rail, even though road passenger traffic is only 16 times higher than that for rail (96,400 million passenger kilometers for road compared to 6,120 million passenger kilometers for rail), and freight traffic is only

1/3 higher for road (25,000 ton kilometers for road versus 19,100 ton kilometers for rail). Thus, the unit pollution cost for road is much higher than that for rail.

These figures give a rough guide to the advantage of rail service in containing environmental pollution. In Thailand, however, the advantage will probably not be as great as in the Swedish case, as most of the Swedish rail network is electrified, while Thailand still relies on diesel locomotives.

ROAD CONGESTION

That traffic congestion is a serious problem for the Bangkok Metropolitan Region (BMR) is more than clear. The problem does not just occur inside Bangkok, but also along routes leading from the city in all directions. For major cities in other parts of the country, such as Chiang Mai or Had Yai, the traffic situations are also becoming severe.

Table 4 shows the rapid growth of traffic on the Bangkok expressway. From this, it is easy to understand why, at times, the expressway becomes more of a car park than an expressway. Nationwide, average road density has also increased rapidly. Table 5 shows transport flows by various types of vehicles for 1984 and 1990 on national and provincial highways, and also the length of the road stocks. It can be seen that the average density on national highways has increased by over four times between 1984 and 1990.

With continuing high growth of transport demand, the present traffic situation on the roads has every prospect of getting worse and worse. More intensive use of rail transport in the future may help to alleviate this worsening trend.

Table 4 Bangkok Expressway Traffic 1983-90

Year	Vehicle/Day ('000)	Annual Growth
1983	93.2	—
1984	110.1	16.1*
1985	128.0	16.3
1986	137.5	7.4
1987	162.1	16.0*
1988	224.0	38.6
1989	258.0	14.9
1990	285.4	10.8

* Adjusted to 16.8 kilometer system for the whole year.

Actual system 29/11/81 = 8.9 kilometer,
17/1/83 = 16.8 kilometer,
5/12/87 = 27.1 kilometer.

Source: Expressway and Rapid Transit Authority of Thailand.

SAFETY

In terms of safety, rail transport also has advantages over road transport. Table 6 shows accidents by mode of transport in Thailand for 1990. It can be seen that road accounts for about 94.5-97.5 percent of all the country's accidents, deaths and injuries, while rail accounts for about 2.5-4.8 percent. If this is compared to the 16.6 percent share of rail in inter-provincial land person trips, then the safety rate for rail can be seen to be far superior to that for road. While this comparison is not strictly accurate, as for proper comparison one needs to look at

intra-provincial travel as well and also include freight traffic in the analysis, it seems fairly clear that rail transport should be much safer than road transport. Nevertheless, this does not mean that SRT should not put continued efforts into trying to make rail travel even safer. This is particularly so in view of indications of past deferred maintenance, and increasing age of rolling stock.

COMPETITIVE CONSIDERATIONS

In spite of all the advantages of rail transport, the railway remains a relatively minor player in the Thai transport picture compared to road transport. The railway accounts for not more than 16.6 percent of all inter-provincial passenger movement and only 2.5 percent of all inter-provincial freight movement. To a large extent, this is due to the relatively poor competitive position in Thailand of rail versus road (and also air and waterway) transport, which in turns depends on many factors; such as the country's geography, human settlement and urbanization patterns, overall government policy concerning the transport sector through infrastructure investment, pricing, fare controls etc., and also the operational efficiencies of the various Thai transport providers.

As far as the operational efficiency of SRT is concerned, analyses indicate that it has been fairly satisfactory, in that it has been able to provide increased services for both passengers and freight, while, at the same time, reducing the number of employees and improving the average train speed.³ The principal disadvantage of rail transport, however, is its inefficiency in door-to-door operations. This is especially true for freight services

Table 5 Road Transport Flows-Vehicle-Kilometers on National and Provincial Highways By Type of Vehicle and Type of Highway (Million Vehicle Kilometers)

	1984			1990		
	National	Provincial	Total	National	Provincial	Total
Cars & Taxis	2,135	2,128	4,263	11,005	4,434	15,439
Light Buses	788	1,294	2,083	2,179	1,571	3,750
Heavy Buses	473	472	945	2,083	599	2,682
Light Trucks	1,756	2,263	4,020	8,949	4,770	13,719
Medium Trucks	752	1,037	1,789	3,481	1,503	4,984
Heavy Trucks	665	647	1,312	4,079	1,117	5,196
Total	6,569	7,842	14,412	31,776	13,994	45,770
Route Kilometers	15,072	18,076	33,148	17,486	27,959	45,445
Veh.Kms. Per Rt.Kms. Per Day	1,194	1,189	1,191	4,979	1,371	2,759

Note: Vehicle flows are those on Department of Highways roads only. Dual carriageways included in the route kilometers figures are in carriage way kilometers.

Source: Department of Highways.

Table 6 Accident by Mode of Transport: 1990

	Road	Rail	Waterways	Air	Total
No. of Accidents	28,398	704	26	4	29,132
No. of Casualties	17,956	684	9	42	18,691
- Death	5,753	293	7	38	6,091
- Injured	12,203	391	2	4	12,600
Property Damage ('000 baht)	228,976	n.a.	n.a.	n.a.	
Row Shares					
No. of Accidents	97.48%	2.42%	0.09%	0.01%	100.00%
No. of Casualties	96.07%	3.66%	0.05%	0.22%	100.00%
- Death	94.45%	4.81%	0.11%	0.62%	100.00%
- Injured	96.85%	3.10%	0.02%	0.03%	100.00%

Source: *Transport Statistics 1990*, Ministry of Transport and Communications.

where SRT does not connect directly with the origin or destination organizations. In such cases, the overall transport costs may involve trucking at either end of the route, with high handling costs for transferring from truck to train and train to truck. For short distances, this additional cost is greater than any savings gained by rail transport. This explains why the railway has not been that competitive with road transport, even though analyses show that the unit cost for rail transport (ignoring multiple handling costs) is much less than that for road transport for comparable commodities.⁴ The long-term variable cost for rail transport of petroleum trainloads, for example, is about 0.35 baht per ton/kilometer (1991 prices), while the full cost less annual capital cost of road transport of petroleum comes to about 1.00 baht per ton/kilometer (at a distance of about 200 kilometers). Similarly, for passengers, heavy bus operations at optimum operating speeds cost about 0.28 baht per passenger kilometer, versus express train services which cost 0.18 baht per passenger kilometer, or rapid train services which cost 0.12 baht per passenger kilometer.

For the future, however, with ever more congestion on the roads, and the rapid growth of provincial cities – which may generate large distribution centers near to the rail network that can take advantage of scale economies to reduce multiple handling costs – the railway may be able to compete better with medium- to long-range road transport. Intensive marketing efforts will be needed, however.

Another consideration is government transport policy. It is often suggested that, in the competition between rail and road, the playing field is tilted toward road transport. While the railway has to invest in its own infrastructure and take care of the debt payments, road users are subsidized in that the charges they have to pay do not cover the full cost or even the marginal cost of using the roads. This is certainly the case. Based on

previous studies, it is clear that the road user charges on 6-wheel and 10-wheel trucks (which do the most damage to the roads) do not cover even the marginal road cost. This obviously gives an edge to road transport of freight compared to rail. On the other hand, light vehicles generally pay more road user charges than the marginal road cost.

While present road user charges are biased in favor of road freight transport, however, this is not a major reason behind the competitive edge that road has over rail, i.e., that even if heavy trucks were to pay the full cost of road use (not just the marginal cost) the competitive edge of road over rail would not be affected in a major way. Basically, it is estimated that if 6- and 10-wheel trucks were charged the marginal road cost, then the vehicle operating cost would increase by about 2.5-5.0 percent, while if the full road cost were charged, then the vehicle operating cost would increase by about 5-10 percent. Against this, it has to be borne in mind that transport rates are often very different from vehicle operating costs, and are often two to three times the calculated vehicle operating costs. Thus, an increase in vehicle operating costs by about 5-10 percent is unlikely to have any major impact on the relative competitive position between road and rail transport.

Government policy also applies to rail fares, particularly from passengers. SRT earns over 70 percent of its passenger revenue from Third Class passengers. Political considerations have made fares on this class of passengers extremely hard to increase. This, of course, encourages more rail use than otherwise. The low fare policy is, however, a two-edged sword. It leads to the continued financial loss position of SRT. This leads to deferred maintenance, difficulty in getting investment funds, and a general lack of morale in the staff. The problem is compounded if it is difficult to ascertain the detailed operations that account for the total loss, or if

policy-makers are not interested in such details. In this case, if the organization feels that no matter how much effort it tries to put into improving performance, the loss position will not go away and the organization will continue to be looked upon unfavorably by outsiders as being inefficient and loss-making, then there will be no incentive for improved performance or improved competitive position. This is the kind of situation that SRT finds itself in today, and urgently needs to change.

CONCLUSIONS

From the above, one can conclude that rail transport does have many advantages. The key ones relate to the relatively high **negative externalities** generated by road transport—relative fuel inefficiency, pollution, congestion, and safety considerations. These externalities have not been taken into account in the nation's overall transport policy. Without such considerations, the railway is likely to continue to play a relatively minor role in the nation's future transport needs. The railway's share in passenger transport has been on the decline over the last decade. Without a change in the approach to transport policy, this trend is likely to continue.

In examining the railway's likely future role, a **strategic** approach is recommended. Analyses based on past trends implicitly assume that the current transport policy will continue. This is likely to lead, as expected, to the railway's declining role over time. Such an approach is unlikely to be helpful when looking at the long horizon necessary for transport planning.

Assuming that the negative externalities associated with road transport are considered **important**, and need to be corrected over time, it is suggested that, as a minimum, the rail shares in future transport **should not be allowed to decline** below the share in the base period (1990). While this will mean that the negative exter-

nalities associated with road transport will continue to increase, along with increases in the country's overall transport sector, the target still will not be easily achieved without effort and new investment. If more effective government action to alleviate the harmful externalities associated with road transport is taken, then the railway may even be able to increase its share in the nation's future transport system.

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ENDNOTES

- 1 U.S. Federal Railroad Administration (1991).
- 2 This is drawn from Hansson (1991).
- 3 All this has come at the cost of deferred maintenance and deferred renewal of rolling stock due to SRT's loss position. These have to be corrected in the future.
- 4 See Bevis (1992).

NEWSBRIEF

ANNOUNCING THE 1993 TDMI YEAR-END CONFERENCE

“Who Gets What and How?: Challenges for the Future”

Jointly Organized by The Chai Pattana Foundation and TDMI

Ambassador City Jomtien, Chon Buri, Thailand

December 10-11, 1993

Rapid industrialization has transformed the organization of Thai society and the means by which it allocates and utilizes resources. A market-oriented industrial society demands forms of organization and governance that differ vastly from those of the older, agrarian social order. As the institutions of agrarian society break down or become anachronistic, the means for assigning rights to resource use, for providing public goods, and for assigning priorities in resource allocation are transformed as well. New occupational groups emerge and compete in an expanding political arena for access to scarce resources. The state assumes new functions to promote industrialization and to ensure

its sustainability, while diverse, contradictory pressures come to bear on the machinery of government. As income differentials between the urban and rural sectors widen, the job of governance becomes ever more complex, and the need for effective solutions to inequity problems becomes more urgent.

The 1993 Year-End Conference will address changes in Thai society associated with industrialization, focusing especially on the institutions for assigning development priorities and allocating resources in Thailand. It will then focus on the future, identifying policy issues in a variety of fields with regard to resource utilization, distribution, and equity.

For more information, please contact Khun Niti Nakbunth or Khun Pornjai Nuangkanya at the The Thailand Development Research Institute Foundation Rajapark Building, 163 Asoke, Sukhumvit Road, Bangkok 10110 Thailand Tel. (662)258-9012-7, Fax (662)258-9046

CAT and TDMI Hold Joint Workshops



Shown at the workshop, Mr. Chao Thongma, CAT Executive Advisor.

TDMI's Science and Technology Development Program (STD), in collaboration with the Communications Authority of Thailand (CAT), organized a workshop on “Future Scenarios of the Communications Authority of Thailand,” held June 21-22, 1993, at Sida Resort, Nakhon Nayok. The workshop was a brainstorming session for key CAT personnel and TDMI researchers on CAT's and Thailand's communications systems. The results of the workshop will be used to plan TDMI research on CAT's future direction.

TDMI's STD Program and CAT organized a second brainstorming workshop on “The Future of the Communications Authority of Thailand: Strategic Planning,” held July 10-11, 1993, at Dusit Resort, Phetchaburi. The workshop allowed top CAT executives to discuss needed structural changes in the on-going evolution of Thailand's communications system.



Shown seated from left to right are Mr. Chao Thongma, CAT Executive Advisor; Dr. Chatri Sripaipan, Director of the STD Program; and Mr. Aswin Saovaros, CAT's President. In the background are top CAT Executives and TDMI research team members.

TDRI and NCGEB Co-organize Meeting on R&D in Biotechnology

TDRI's Science and Technology Development Program (STD) and the National Center for Genetic Engineering and Biotechnology (NCGEB) jointly organized a meeting on "The Market Demand for Research and Development in Biotechnological Production," held August 7, 1993, at the Imperial Hotel, Bangkok. The meeting set up a forum for representatives from the private sector, specialists in biotechnology, and researchers to determine the direction Thai research and development in biotechnology should take to meet market demand.



Shown from left to right are Dr. Chartchai Takulrangsi, Executive Member of Country Fresh Dairy Co., Ltd; Dr. Suphsorn Chayowan, General Manager of Kerry-Glory Flour Mills Co., Ltd; Dr. Sakarindr Bhumiratana, NCGEB Director; Dr. Chatri Sripaipan, Director of the STD Program; Dr. Ammar Siamwalla, TDRI President; Dr. Sutat Sriwatanapongse, NCGEB's Deputy Director; and Dr. Bhinyo Panijpan, Lecturer at Mahidol University.

TDRI and the Ministry of Finance Hold Joint Workshops and Training Courses

TDRI's Sectoral Economics Program (SEP) organized the following in-house seminars and training sessions from May-August, 1993:

The Dynamics of Thai Agriculture, presented by Dr. Direk Patmasiriwat, Research Fellow of TDRI's Natural Resources and Environment Program, held May 11.

The Total Factor Productivity of Rice, presented by Dr. Direk Patmasiriwat, Research Fellow of TDRI's Natural Resources and Environment Program and Mr. Somporn Isvilanonda, Research Fellow of TDRI's SEP Program, held June 7.

Progress on the AFTA Agreement since January 1993, presented by Mr. San Visespong, Chief of the Fiscal and Tax Policy Division of the Ministry of Finance, held June 22.

Thirty-five-years Development of the Thai Economy, a training course for officers of the Office of Industrial Economics, the Ministry of Finance, held July 26. Dr. Nipon Poapongsakorn, Director of the SEP Program was the principal speaker.

Thai Textile Industrial Organization, training course for officers of the Office of Industrial Economics, the Ministry of Finance, held August 19. Lecture by Dr. Rojana Kosaiyanonda, Managing Director of TTIS Company Ltd.

SEP also jointly organized the following training courses, held at the Ministry of Finance, with the Office of Industrial Economics during August, 1993:

Location Theory, a training course for officers of the Office of Industrial Economics, held August 6. A talk was given by Dr. Araya Preechametta, Lecturer at Thammasat University.

The Thai Electronics Industrial Organization, a training course for officers of the Office of Industrial Economics, held August 9. Lecture by Dr. Anupap Tiralap, Research Fellow of TDRI's Science and Technology Development Program.

The Theory of Industrial Organization, a training course for officers of the Office of Industrial Economics, was held on August 18. Lecture by Dr. Nipon Poapongsakorn, Director of the SEP Program.

New Contracts

TDRI to Study the Thai Narcotics Economy

TDRI's Sectoral Economics Program (SEP) is to undertake a two-year project on the Thai Narcotics Economy, funded by both the U.S. Embassy and the Office of the Narcotics Control Board. A TDRI research team will conduct a survey of drug addicts and re-estimate the size of the drug economy. The five drugs to be investigated are heroine, opium, marijuana, amphetamine and inhalants. The survey methodology, as well as a sampling design, has tentatively been worked out.

Ministry of Industry Contracts TDRI to Study Thai Manufacturing Industries

TDRI's Sectoral Economics Program (SEP) is to undertake a study, entitled "The Development of Thai Manufacturing Industries: An Industrial Organization Approach," for the Ministry of Industry. This project will provide research and database management skills to the staff of the Office of Industrial Economics. The four industries to be studied are textiles, petrochemicals, food-processing and electronics. Industrial surveys of the nine key industrial provinces specified in the Seventh National Economic and Social Development Plan will also be undertaken. The project began July 6, 1993, and should be completed by January 1, 1994.

TDRI to Study the Role of BAAC

One of the policy measures to narrow the rural-urban income gap is to extend more institutional credit to the rural sector. The government has asked the Bank of Agriculture and Agricultural Cooperatives (BAAC), which has successfully extended agricultural credit for many years, to provide loans to the rural non-farm sector. BAAC has therefore commissioned TDRI to assess

whether BAAC should change its mandate restricting its role of providing only agricultural credit. If accepted, a new mandate would expand credit to include the non-agricultural sector. The study, entitled "Assessing the Role of BAAC in Extending Credit to the Rural Non-farm Sector," will also assess current weaknesses in BAAC's agricultural credit practices. The project began July 6, 1993, and should be completed by September 30, 1993.

NSTDA Contracts TDRI to Conduct Research on Thai Information Technology Personnel

TDRI's Science and Technology Development Program (STD) recently signed a contract with the National Science and Technology Development Agency (NSTDA) to conduct research on the "Development of Information Technology (IT) Personnel in Thailand." A TDRI research team will collect data for this project and propose recommendations. This will assist NSTDA's Subcommittee for Planning the Development of IT Personnel to draw up strategies to train IT personnel more thoroughly in improved working methods.

TDRI to Study Tariffs and Import of Electronic Parts

TDRI's Science and Technology Development Program (STD) recently signed a contract with the National Science and Technology Development Agency (NSTDA) to conduct research on "The Effects of the Restructuring of Tariffs on Electronic Parts and Their Import Procedure." The study will assess the current status of electronic parts in Thailand to find out the procedures, duties, and problems associated with and regulations governing their import. It will also propose alternatives to current import regulations, procedures, and customs duties on these, while giving the pro's and con's of each alternative.

Completed Project

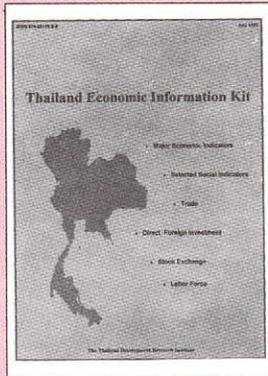
"Future Direction of the Communications Authority of Thailand"

TDRI's Science and Technology Development Program (STD) has recently completed its research on "The Future Direction of the Communications Authority of Thailand (CAT)." The research work, contracted by CAT to TDRI, included studying Thailand's postal and telecommunications service policy and collecting information on other countries' experience in telecommunications and postal service restructuring. The study analyzed the shortcomings of present laws and ministerial regulations affecting CAT, assessed CAT's strengths and weaknesses and, at the

same time, its operational efficiency in management, finance, technology, services, and manpower. It also studied CAT's expansion plans in both post and telecommunications.

The study evaluated CAT's present role, its problems, and the possible benefits and drawbacks of private sector participation with CAT. It also produced recommendations as to CAT's appropriate restructuring and laid down guidelines to upgrade its efficiency and competitiveness with both public and private entities, locally and internationally.

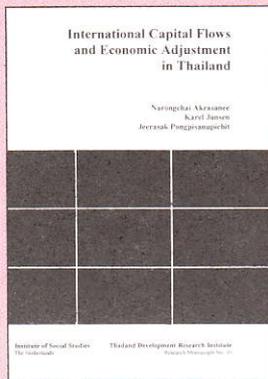
NEW TDRI PUBLICATIONS



Thailand Economic Information Kit 1993

TDRI has just compiled its 1993 Thailand Economic Information Kit. It contains a wealth of statistical information on Thailand's economic development, such as Gross Domestic Product (GDP), broken down by region and sector. Trade statistics include trade with various foreign countries, Thailand's principal exports, and historical export/import levels. Financial information includes capital flows, country credit rating in the Asia-Pacific region, foreign direct investment, and investment promotion.

The Kit also contains social indicators, such as employment statistics by sector and education level, employee wages per month. Produced by TDRI's Macroeconomic Policy Program, this publication costs just 100 baht (US\$4.00, plus US\$3.50 postage).



International Capital Flows

by Narongchai Akrasanee, Karel Jansen, and Jeerasak Pongpisanupichit

In the two decades under study in this book, the relationship of developing countries, such as Thailand, with international financial markets underwent a process of fundamental change, accompanied by many shocks. The central question of this study is how these changes and shocks in international finance have affected the rate and pattern of economic growth, the stability of the economy, and the role and effectiveness of national economic policy.

The central focus is on the interaction between international capital flows and domestic adjustment, as reflected in investment, savings, and financial intermediation. An important undertaking is the study's reassessment of the role of economic policy in such interactions. The study concludes that the recent high levels of foreign capital inflows have contributed to an acceleration of economic growth, but have also raised questions about the longer-run sustainability of the patterns of growth and about the reduced effectiveness of policy instruments.

*Price: Baht 250
(US\$10.00 plus
US\$10.00 postage).*

Research Monograph No. 10



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