

Chapter 7

Thai Agriculture to the 1990s

Agriculture in Thailand has been assumed by some planners to be of declining economic importance, a view belied by its continued support of rural dwellers, its ongoing role as the engine which powers the Thai economy, and the failure of rural industrialisation policies. Production-agriculture continues to grow, albeit at a pace slower than that of the young manufacturing and industrial sectors; it also makes demands on the natural environment in common with those other sectors. However, the broad sector of Thai agriculture and agribusiness today is a component of global agribusiness which is far more diverse than the wet rice of its origins. The social and economic roles of agriculture were revealed during the high economic growth of the 1980s and 1990s and the subsequent recession which was softened by agriculture's reliable foreign income earning capacity, and its social buffering effect in the absence of welfare programs. However, production-agriculture has now become synonymous with rural poverty, suggesting its ability to subsidise urban lifestyles and other developing sectors has been exceeded, thus negating a fundamental assumption of Thai development planning.

Thailand is an agricultural country. In 1990 more than 23 percent of exports were primary agricultural commodities, falling to 16 percent in 1995. Similar figures for the Philippines and Malaysia were 15 percent and 11 percent, for Indonesia 11 percent and 12 percent, China eight percent and six percent¹. Thailand's principal agricultural export markets in 1994 were Japan (22 percent), Europe (19 percent), East Asia (12 percent), United States (10 percent) and China (10 percent) and for agriculturally related imports were Europe (25 percent), United States (19 percent) and China (six percent).² Thailand is the world's largest rice exporter,

¹ The Economist (1998)

² FAO (1996)

exporting around 60 percent of production, the world's largest producer and exporter of canned pineapple, natural rubber, and Black Tiger Prawns, and a major producer of sugar, and fruit and vegetable production including canned products. In addition to economic ties to agriculture, Thailand depends on agriculture as a social welfare system with farming continuing to employ more than 50 percent of domestic labour.³

Thai agriculture of the 1990s is the product of history and recent policies. Preceding chapters have chartered that history. While post-war development bore some similarities to Japan,⁴ central planning and foreign influence in policy combined with rapid agricultural expansion in the 1970s, created a uniquely Thai outcome which has inadvertently produced high rural social and environmental costs. The intent and omissions of agricultural development policy are evident in the national planning process which began in 1959.

Agricultural Planning Context

Foreign development theory applied to Thai planning began with an economic emphasis through National Economic Development Plans to which the word 'social' was added in a later decade. Through five year plans 1 to 8, agriculture is assumed to underwrite development in other sectors. Policies, programs, and projects derived from these plans articulate cohesive approaches, including agricultural development, in conformity with the art of writing development plans. However, implementation of all eight plans has emphasised certain programs over others to the detriment of agriculture. A derivative approach, planning did not necessarily try to build industrial growth on comparative advantages in agriculture, notwithstanding Thailand's unique position. Rural social and environmental issues would probably have received a higher profile in such an approach.

Reduced economic emphasis on agriculture is clear in the 1950s and 1960s GDP figures (Table 7.1). Through this period exports remained overwhelmingly agricultural and about 80 percent of labour was consistently employed in the sector, although the ratio of income per capita from agricultural compared to non-agricultural activities averaged 1:9 when ratios in countries with more consistently successful economic records average from 1:4.3.⁵ This could

³ Stoeckel, A. et al (1998)

⁴ Boonma, Sawai (1974)

⁵ Ingram, J.C. (1971)

indicate the higher proportion of product sold on the export market, an underestimation of the contribution of agriculture to GDP,⁶ or even the centuries-old policy of harvesting resources from rural areas.⁷

Table 7.1 *Change in Share of Gross Domestic Product 1951 - 1968*⁸

Sector	1951	1968	Change
Agriculture	50.1	31.5	-18.6
Industry	18.3	31.1	+12.8
Services	31.6	37.4	+5.8

Regular export income and cushioning in times of recession have long assumed a subsistence option for farmers.⁹ This simple approach has allowed Thailand to avoid balance of payment crises common to food importing countries where shortages, inflation, and disorder commonly follow recession. Thai technocrats who initially advocated agriculture-led growth strategies were enticed by the success of newly industrial countries from the 1960s' investments in industry. Advantages in the production of rice¹⁰ were overshadowed by diversification policies¹¹ which, by the 1980s, had made the Thai economy dependent on the global agricultural and agribusiness community.¹² Once the low-cost agricultural land-expansion had ceased, policy emphasis overtly mimicked the industrialisation paths of high-growth Asian economies. The quest for industrial and manufacturing growth appeared to have been fulfilled by the early 1990s (Table 7.2).

Table 7.2 *Proportion (%) of GDP for Three Sectors, 1970-1993*¹³

Year	Agriculture	Industry	Manufacturing
1970	27	25	16
1980	21	31	22
1990	14	36	25
1993	12	38	26

⁶ Silcock, T.H. (1970)

⁷ Phongpaichit, Pasuk and Baker, C. (1998)

⁸ Ingram, J.C. (1971)

⁹ Phongpaichit, Pasuk and Baker, C. (1998)

¹⁰ Tinprapha, Chatri (1979)

¹¹ Mekong Secretariat (1979)

¹² Douglass, M. (1984)

¹³ Bank of Thailand (1995)

Low investment in agriculture between 1850 and 1940 has been explained in terms of the conflicting objectives between national security and economic development¹⁴ on the one hand, and between the private sector, elite decision makers, and social objectives on the other.¹⁵ Agricultural policy in the 1940s was largely without form although a prescient United Nations' report identified needs for improved rice production, irrigation, rinderpest control, forest management, agricultural statistics, and support services.¹⁶ The subsequent agricultural wealth created with irrigation in the Chaophraya Delta¹⁷ resulted from such foresight.

Planning History

The first of the major texts on Thai agriculture¹⁸ identified the three constraints to agriculture as; under-population, poorly developed credit and marketing systems, and lack of a technical system for development and promotion of industrial knowledge. Seven decades later, population and credit are readily available, while the need for improved research and technology adoption continues.

From a tradition of rurally funded national development,¹⁹ and of innovation and leadership coming only from the highest levels,²⁰ Thailand appeared to have a sound basis for economic development. Requirements to stimulate industrial development through directives to the bureaucracy suited the planning approaches of the 1950s. Initially a mere collection of departmental activity programs, the planning process quickly evolved to a sophisticated application of planning techniques, often barely tested elsewhere, based on generic developing country assumptions which under-emphasised Thailand's unique agriculture.

A functional environment for planning normally requires feasibility analysis of policy objectives and alternatives, evaluation of existing programs, economic and human resources, and broadly-based societal objectives, in order to

¹⁴ Feeny, D. (1983b)

¹⁵ Feeny, D. (1979)

¹⁶ FAO (1948)

¹⁷ Takaya, Y. (1987)

¹⁸ Zimmerman, C.C. (1931)

¹⁹ Hong, L. (1984)

²⁰ Ingram, J.C. (1971)

formulate acceptable outcomes.²¹ Such a planning environment has been sought across the eight Thai plans, although limitations in legislative and enforcement systems and of educated human resources have hampered both planning and plan implementation.

Thai development planning dates from 1959 when Prime Minister Sarit Thanarat effected significant changes after close contact with USA economic advisers. The first five-year plan spanning 1961 to 1966 aimed to consolidate political power through stability and economic growth. By the time of the second five year plan for 1967 to 1971, GNP had expanded by seven percent reflecting significant USA monetary and policy influence, and exceeding the first plan's target of six percent. The success of the first plan enhanced the power of concerned government institutions. The Office of the National Economic Development Board (NEDB) became responsible for macro- and micro-economic analysis while the Office of the Under Secretary to the Prime Minister became responsible for evaluation of administrative effectiveness, in cooperation with the Budget Bureau. These arms of government developed great influence; in one assessment of their effectiveness they appear as Western civil service styles.²²

Agricultural development²³ in the plans emphasised infrastructure through irrigation and research facilities during the first and second plans, moving into land consolidation, farm level irrigation and land titling in the third plan (1972 - 1976). Subsequent plans included; land reform and credit expansion in the fourth plan (1977 - 1981), rural development in designated poverty areas in the fifth plan (1982 - 1986), introduction of a market-led production and diversification system in the sixth plan (1987 - 1991), and efficiency of natural resource use, enhanced research and technology transfer, further market orientation and agro-industry development in the seventh plan (1992 - 1996).²⁴ The eighth plan aimed to redress social issues associated with inequitable growth in rural areas, thus reorienting agricultural production from an economic to a social sector.

²¹ Framingham, C.F. et al (1982)

²² Changrien, Phaibul (1972)

²³ Sapatini, O. (1972)

²⁴ Tonpang, Sopin (1988)

Policies of the late 1970s and early 1980s were biased against agriculture,²⁵ in order to subsidise industrial development.²⁶ Agricultural exports were to maximise foreign income²⁷ from assumed comparative advantages in crops, livestock, and fisheries.²⁸ Foreign assistance²⁹ and government both ambiguously espoused agricultural diversification.³⁰ Agro-processing based growth policies³¹ were poorly linked to production agriculture, producing such anomalous outcomes as textiles and clothing becoming a larger export earner than rice by 1985,³² while development of links to multinational textile houses were ignored. Likewise, policies for agricultural education were separated from those for agriculture through the 1960s,³³ thereby affecting rural education and closing some opportunities in agriculture.³⁴ Policies followed unplanned agricultural land expansion,³⁵ itself driven by population growth and high global prices which masked agricultural input and local commodity pricing mistakes.³⁶ However, technology adoption by small-holders was slow as a reflection of perceptions of risks foreign to most planners,³⁷ notwithstanding rhetoric associated with coups³⁸ and democratic changes of government. Persistent malnutrition and slow technology adoption compared to neighbouring food-deficit countries suggest the primacy ascribed to economic over social development³⁹.

Foreign Fillips to Planning

Foreign aid became a significant influence in Thai development from the 1950s.⁴⁰ The USA provided approximately \$150 million in economic and \$222 million in military aid between 1951 and 1957 as part of its Vietnam Conflict

²⁵ Siamwalla, Ammar et al (1986)

²⁶ Jutsuchon, Somchai (1989)

²⁷ van der Meer (1981)

²⁸ Siamwalla, Ammar et al (1989)

²⁹ AIDAB (1991)

³⁰ Siamwalla, Ammar et. al. (no date)

³¹ Muscat, R.J. (1984)

³² Suphachalasai, Suphat (1997)

³³ Harold Freeman, H. (1965)

³⁴ Khoman, Sirilaksana (1993)

³⁵ Suthasupa, Paiboon (1982)

³⁶ Panayotou, T. (1987)

³⁷ Feeny, D. (1983a)

³⁸ Girling, J.L.S., (1969)

³⁹ Panayotou, T. (1984)

⁴⁰ Muscat, R.J. (1990)

expenditure. Economic aid included improvement of highway⁴¹ and rail networks, in addition to technical assistance in agriculture, economic planning, education, and irrigation⁴². An average annual addition of more than \$60 million to a Thai budget of about \$200 million, and outside parliamentary control, strongly influenced development outcomes. The many agricultural economic studies conducted through the 1970s⁴³ similarly provided intellectual foundation for planning.

Improved infrastructure integrated remote villages, completing nation creation objectives and facilitating implementation of education and health policies. Foreign aid substituted for government investment; reaching about one-third of development expenditure between 1955 - 1965.⁴⁴ Evidence of this influence in agriculture remains in; irrigation schemes, plant breeding expertise which produced the maize variety Suwan, agricultural and applied economic education at Kasetsart University, and transport infrastructure which allows efficient product marketing,⁴⁵ among many other examples.

Plans One to Eight

Foreign aid was soon brought within the purview of the national planners. Synergistic allocation of resources should have resulted although government institutions were unprepared for this Western approach. From the experience of the first National Economic Development Plan's simple collation of departmental activity plans, new institutional arrangements were seen as necessary. A Ministry of National Development was established which included the Department of Land Development and the Royal Irrigation Department, previously within the Ministry of Agriculture. Dams without water distribution schemes resulted, for example, despite well-meaning intentions to increase regional programs through agricultural centres at Chai Nat and Khon Kaen.⁴⁶

⁴¹ Conley, D.M., Vathana, Chamnong and Heady, E.O. (1978)

⁴² Wyatt, D.K. (1984)

⁴³ Iowa State University (1979)

⁴⁴ Corden, W.M. and Richter, H.V. (1967)

⁴⁵ Silcock, T.H. (1970)

⁴⁶ Silcock, T.H. (1970)

The first plan highlighted the limited power of the Office of the Under Secretary to the Prime Minister in coordinating government line agencies.⁴⁷ It possibly widened cultural separation and increased rural dependence on urban centres partly through creating off-farm opportunities which fragmented the social infrastructure of the rural Northeast. Mechanisation and upland cash cropping further stimulated rural migration without consideration of longer term opportunities for displaced persons.⁴⁸

The second National Economic and Development Plan was based on some analysis of market demand and resources, including manpower. Agriculture was addressed to meet domestic demand for fruit and vegetables while assuming continued mono-cropping of rice based on current techniques. Intentions to distribute the benefits of economic growth to agricultural producers was predicated on a fall in the proportion of the population engaged in agriculture, and a small improvement in equity occurred.⁴⁹ However, the main benefit was for those farmers who exited agriculture to join the much better rewarded non-farm sector. The plan included investments in agricultural research and infrastructure development, and assistance to farmers in politically sensitive areas.⁵⁰ State enterprises⁵¹ received less emphasis in favour of private import substitution and industry, which favoured the primarily Chinese-Thai ownership of such businesses.⁵²

The third National Economic Development Plan considered the difficult issues of agricultural land consolidation and allocation, distribution of water to farm level, and issuance of land title deeds, all aimed at introducing Green Revolution technologies.⁵³ Security of land title was to allow mortgage-backed credit to finance fertiliser and other inputs necessary to obtain the benefits from irrigation and land consolidation. The increased sophistication in such planning raised expectations of the approach, which was then extended to include social objectives.

⁴⁷ Changrien, Phaibul (1972)

⁴⁸ Vallibhotama, Srisakra (1989)

⁴⁹ Stifel, L.D. (1976)

⁵⁰ Silcock, T.H. (1970)

⁵¹ World Bank (1959b)

⁵² Owen, N.G. (1992)

⁵³ Paopongsakorn, Nipon (1995)

The fourth National Economic and Social Development Plan used the Division of Agricultural Economics' new national crop model, which was hoped to provide for annual modifications and subsequent five year plans. The crop model was based on incomes from rice and upland crops, under-employment and unemployment, availability of land, utilisation of agricultural inputs including fertiliser and new crop varieties, and the allocation of targets for the expansion of upland cropping.⁵⁴ The issues considered in designing the agricultural component of the fourth plan included; high population growth, the low average incomes of farmers, rising unemployment among agricultural workers, low agricultural productivity, low rates of technology adoption by farmers, limited availability of agricultural land, and farmer resistance to new technologies.⁵⁵ Rural development attracted Royal projects, foreign aid, a Bangkok Bank community development fund, and army development of irrigation schemes. Poverty alleviation became the national security priority through the fourth plan.

The fifth National Economic and Social Development Plan designated the poorest 12,555 villages in the country to receive special development funds. However, national security, not welfare, proved the more powerful motivation. Implementation of the program slowed in proportion to reductions in rural and border insurgency. By 1985, it was estimated that 30 percent of farmers had fallen below the poverty line, compared to 23 percent in 1981, as a result of poor implementation of plan when prices for upland crops declined. Studies of the period indicate that government export taxes stifled rice and rubber production.⁵⁶

In the sixth National Economic and Social Development Plan, agriculture returned to its national economic role in a broader view of the global markets. The plan contained no specific chapter concerning agriculture, discussing it under headings of rural development and natural resources.⁵⁷ From this period, the separation of agricultural crops into two categories became standard; products with excess supply and grown for export, including rice, maize, coffee, and cassava, and for which quality improvement appear feasible were separated from a second group comprised of domestic crops such as garlic, onion, shallot, palm oil, and

⁵⁴ Division of Agricultural Economics (1976a)

⁵⁵ Division of Agricultural Economics (1976b)

⁵⁶ World Bank (1980a)

⁵⁷ NESDB (1987)

coconut oil where market improvement, development of agro-industry and import regulations were seen as more important. A third group with insufficient supply such as soya bean meal, fishmeal and cotton were to be promoted through import restrictions. Attempts to introduce water usage fees, notwithstanding a past tradition of contributing both money and labour through the traditional *muang fai* system, confounded government investments and the economic benefit of large scale irrigation schemes. Analyses of such experience informed formulation of the seventh plan.

The seventh National Economic and Social Development Plan included productivity enhancement and adding value to primary products. Couched in terms of modern Western agriculture, the plan listed five areas for action; efficient use of natural resources, support for research and development, technology transfer, restructuring production to suit local conditions and market demand, development of agro-processing industries, and improved agricultural cooperative development.⁵⁸ Programs or projects⁵⁹ specific to each of these were compromised by; Thailand's limited influence on world prices, government's assumed better forecasting ability than farmers', uniform packages which ignored regional and individual variations, mis-orienting subsidy programs to wealthier rather than poorer farmers, and inadequate government services and inputs. Assumed 'trickle down' of rural wealth,⁶⁰ the 1960s advent of farm labour,⁶¹ and pragmatic farmer responses to unintended incentives⁶² led to uneven development⁶³ as Thailand accepted a price-taking role for exports.⁶⁴ By the eighth plan, farmer debts from government programs, including inedible and unmillable red millet⁶⁵ and infertile, expensive, imported cattle,⁶⁶ had made small-holders cynical of government programs.

⁵⁸ NESDB (1991)

⁵⁹ Poapongsakorn, Nipon (1995)

⁶⁰ Moerman, M. (1968)

⁶¹ Moerman, M.H. (1964)

⁶² Rogers, K.D. and Itharattana, Prasit (1977)

⁶³ Parnell, M.J.G. (1996)

⁶⁴ Ramangkura, Virabongsa (1972)

⁶⁵ Bangkok Post (1995)

⁶⁶ Phongpaichit, Pasuk and Baker, C. (1998)

The eighth National Economic and Social Development Plan (1997-2001), developed before the 1997 economic crisis, sought stable economic growth, social equity, and improved public administration. Agriculture was considered within the development objectives of: improved child education and development; compulsory education to nine years rising to twelve and teacher training; upgrading industrial workers; assisting the underprivileged; reducing avoidable accidents; reducing the current account deficit and inflation; increasing domestic savings; improving regional and rural infrastructure; reducing poverty; preserving and rehabilitating forest areas; increasing awareness of sustainable alternative agriculture; and promoting investment in rehabilitation and protection of the environment.⁶⁷ An adjustment to the plan post-crisis, discussed later, bridged the period to preparation of the ninth plan.

National development plans provide an insight to the aspirations of government. Unconscious creation of a disadvantaged rural sector is not uncommon in other countries, yet seems inconsistent with priority policy foci of political stability. The dual issues of rural poverty and environmental decline⁶⁸ have been exacerbated through the planning period. This was not immediately evident in Bangkok in an overheating economy, or even earlier when agriculture was expanding by low-cost land expansion and introduction of the simple Green Revolution technologies.

Agricultural Growth

From the 1950s, rapid agricultural growth fuelled Thailand's economy. Based on unused land and available population, the more than 80 percent of the population resident in rural villages expanded agriculture with government's tacit blessing.⁶⁹ Discrepancies of up to 20 percent for rice production between figures from 1958 to 1968 of the Ministry of Agriculture and the National Economic Development Board⁷⁰ reflect that knowledge of agriculture was mainly oriented to revenue collection. Thailand's unsurpassed land expansion capacity⁷¹ up to the 1980s⁷² existed through absence of its neighbours' colonial conflicts, a rigid feudal

⁶⁷ NESDB (1997)

⁶⁸ Falvey, L. (1996)

⁶⁹ Phongpaichit, Pasuk and Baker, C. (1998)

⁷⁰ Ingram, J.C. (1971)

⁷¹ Phongpaichit, Pasuk (1989)

⁷² Phongpaichit and Baker, C. (1997)

system, or resistance to absorbing other cultures, in particular Chinese immigrants.⁷³

Falling world prices and uncertain trade conditions associated with oil crises marked an end to the long post-war boom in primary products. EEC countries introduced import quotas, the USA protected its rice industry, and new competitors to Thailand emerged in China and Vietnam.⁷⁴ More important to Thailand, was the success of the Green Revolution in rice importing countries.⁷⁵ At the same time, agro-processing became a focus of planners. Captured under manufacturing and industrial statistics rather than agriculture, this component of the sector dealt with such products as frozen chicken, sugar, pineapples, cut flowers, fresh fruit and vegetables, pepper, coffee, and marine and aquaculture products. Rice, cassava, maize, some field crops, and vegetables declined in significance through the 1980s while rubber, sugar cane, soya bean, tree crops and flowers increased, government protection or subsidy assisting in the first three industries. Dairy products and other livestock showed the highest growth while the poultry sector had the highest added value share. By contrast, water buffalo, once a symbol of Thai agriculture, were being rapidly substituted by two and four wheeled tractors.⁷⁶

Economic growth thus relied on exploitation of natural resources as the direct harvesting sectors of forestry and fisheries indicate; over the ten years from 1975 - 1985, the forestry sector grew from \$190 million to \$215 million dollars, and the fishery sector from \$231 million to \$304 million. Fishing expanded from a household industry to trawling, and then to motorised trawl-net fishing with consequent over-extraction. Forests shrank as loggers used security and expanding upland agriculturists as cover for effectively unregulated extraction of valuable timbers.⁷⁷ However, the widest social and environmental impacts occurred through agriculture with expansion of cropping, fertiliser use, irrigation, and mechanisation.

⁷³ Silcock, T.H. (1970)

⁷⁴ Phongpaichit, Pasuk and Baker, C. (1997)

⁷⁵ CGIAR (1999)

⁷⁶ Paopongsakorn, Nipon (1995)

⁷⁷ Arbhahirama, Anat (1989)

Cropland Expansion

Government influence on agricultural production was limited, although pricing policy, infrastructure development, and social programs created sometimes unintended agricultural outcomes. Crop pricing policy was used to regulate rice and maize production more effectively than for kenaf and cassava, and justified in terms of an expected shift of resources back to rural areas.⁷⁸ However, irrigation infrastructure probably provided the greatest stimulus to change in rice where transplantation substituted for broadcasting of seed in the Central Plain. In upland agriculture, swiddening was displaced by modern agricultural systems after widespread, logging, road development, and control of malaria occurred.

Logged areas were soon planted to corn which had been a minor crop since its introduction by Portuguese traders some 400 years earlier. Likewise the 1845 Portuguese introduction, cassava, expanded from an inter-crop between rubber trees to the less fertile Northeast. Soya bean, introduced to Thailand more than 200 years ago by Chinese immigrants, grew from a small upland crop to become widespread both in the uplands as an irrigated second crop after rice. Cotton expanded as an import-substitution crop until uncontrollable insect attacks (American Army Worm, *Heliothis armigera*) curtailed the industry. Other upland species included star apple, mango, longan, pomelo, and sweet tamarind, while fresh vegetables became an important commodity in irrigated areas.⁷⁹ Crop expansion over this period, 1950 - 1967 is presented in Table 7.3.

⁷⁸ Rogers, K.D. and Itharattana, Prasit (1982)

⁷⁹ Silcock, T.H. (1970)

Table 7.3 Average Annual Plantings for Crops ('000 rai)⁸⁰

Product	1950 - 52	1958 - 60	1965 - 67
Upland Food Crops			
Maize	255	1,275	4,113
Mung Beans	221	289	808
Cassava	n.a.	371	777
Sugar cane	412	911	865
Oil Seeds			
Castor	76	172	265
Groundnut	448	661	759
Sesame	107	135	188
Soya beans	136	139	276
Coconuts	560	903	1,598
Fibre Crops			
Cotton	242	302	565
Kapok	n.a.	341	333
Kenaf	62	427	2,631
Jute and Ramie	30	23	57
Garden Crops	n.a.	317	1,021
Fruits	n.a.	528	1,646
Rubber	2,204	2,930	4,167
Tobacco	243	379	458
Total	4,996	10,103	20,518

Fertiliser

Green Revolution technology,⁸¹ combining irrigation, fertiliser, high yielding varieties and pest control in a closely managed production environment, was adopted slowly in Thailand. The Kingdom was not under the same imperative as food deficient countries in which Green Revolution research centres were located. Nevertheless, by the 1990s, Thailand had become a significant importer of fertiliser and pesticides, with a small local production capacity. Fertiliser distributed by the Marketing Organisation of Farmers to the four regions of the country (Table 7.4) indicates a nearly four-fold increase over the period 1992 to 1996, while local mixing capacities for chemical fertiliser rose by a factor of four over the period 1986 - 1995 (Table 7.5); fertiliser consumption over this period rose by a factor of 2.5.⁸²

⁸⁰ Ministry of Agriculture (1970)

⁸¹ CGIAR (1999)

⁸² Marketing Organization for Farmers (1997)

Table 7.4 Quantity of Fertiliser Distributed by MOF by region, 1992 - 1996⁸³

Region	Tons of Fertiliser				
	1992	1993	1994	1995	1996
Northeast	50,251	64,991	72,657	80,648	191,189
North	25,029	26,935	21,244	36,635	59,601
Central	20,428	32,184	33,957	56,951	108,474
South	12,070	16,789	5,696	33,259	24,404
Whole Kingdom	107,779	140,901	133,556	207,493	383,669

Table 7.5 Local Mixing Capacities (ton) of Chemical Fertiliser 1986 - 1995⁸⁴

Year	Total	Plant Nutrients		
		N	P ₂ O ₅	K ₂ O
1986	287,000	44,828	32,851	21,776
1988	393,722	61,264	36,676	35,392
1990	439,890	69,080	47,885	41,760
1992	440,085	64,386	49,790	42,920
1994	422,495	63,953	47,122	35,043
1995	564,307	89,907	68,458	48,662

Fertiliser used in rice production rose from 660,000 ton in 1986 to 1.5 million ton in 1995⁸⁵. Imported quantities of the other major agricultural chemicals, pesticides and herbicides are presented in Table 7.6, and the relative rate of adoption of Green Revolution technology by Thailand in comparison with neighbouring countries is indicated in Table 7.7. Expansion of Thai production has relied on natural endowments to a greater extent than the intensive technologies, thereby providing either, a buffer against the environmental costs of that technology, or scope for future economic expansion.

⁸³ Marketing Organization for Farmers (1997)

⁸⁴ Ministry of Agriculture (1998)

⁸⁵ Office of Agricultural Economics (1997)

Table 7.6 Quantity and CIF Value of Imported Pesticides, 1995⁸⁶

Type of Pesticides	Number Products	Quantity (kg)	CIF Value (baht)
Insecticide	85	10,559,540	1,644,159,884
Acaricide	8	519,760	91,657,394
Fumigant	2	50,094	10,659,173
Rodenticide	3	86,440	5,283,057
Fungicide	65	6,937,092	603,454,306
Herbicide	55	19,954,485	2,043,770,462
Plant Growth Regulator	13	610,798	100,649,987
Mulluscicide	2	36,326	3,650,789
Total	233	38,754,535	4,503,285,052

Table 7.7 Total Fertiliser Consumption by Irrigated Area in Asia⁸⁷

Region	Total Fertiliser Consumption			Annual Growth (%)	
	1975	1985	1995	1975-85	1985-95
Southeast Asia					
Cambodia	1.12	0.00	58.38	-1	41
Indonesia	125.41	458.56	558.17	13	2
Lao-PDR	2.50	16.81	34.97	19	7
Malaysia	805.26	1,830.54	3,323.53	8	8
Myanmar	56.07	178.88	109.99	12	-5
Philippines	218.17	196.65	381.72	-1	7
<i>Thailand</i>	<i>74.47</i>	<i>113.44</i>	<i>311.64</i>	<i>4</i>	<i>10</i>
Vietnam	330.00	217.85	724.00	-4	12
East Asia					
China	160.17	378.00	713.67	9	6
Japan	568.05	689.02	609.26	2	-1
Rep. of Korea	677.76	609.06	714.73	-1	2
Mongolia	152.17	310.00	31.25	7	-23
South Asia					
Afghanistan	14.97	28.21	17.86	6	-5
Bangladesh	149.49	260.82	372.59	6	4
Bhutan	4.55	3.33	2.56	-3	-3
India	103.58	203.55	267.97	7	3
Nepal	53.30	57.12	105.90	1	6
Pakistan	40.63	95.88	145.80	9	4
Sri Lanka	150.83	335.31	363.38	8	1

⁸⁶ Ministry of Agriculture (1998)⁸⁷ FAO (1998)

Irrigation, Mechanisation and Credit

Although Thai agriculture evolved from a wet rice culture, modern irrigation systems derived much from foreign technology. Large dam construction has aimed to increase rice area and production, and more recently hydropower, and industrial water supply. Since the second National Economic Development Plan, medium-scale systems initiated in response to perceived needs for additional water have been most common.⁸⁸ In some cases, this included essential works for large dams constructed earlier without adequate distributary and drainage systems which, for more than a decade, caused modern storage facilities to be linked to remnants of village-based distributary systems which were unsuited to the overall system design.

Initially less important to expansion,⁸⁹ 1990s Thai agriculture is characterised by water issues within and between river basins,⁹⁰ over quality,⁹¹ political and institutional rivalries,⁹² and public concern about dam construction. Market failure caused by open access to irrigation has changed Thailand from a country with a self image of water abundance, to one of shortage. Now addressed legislatively for surface water, ground water, and water quality,⁹³ improved cropping efficiency, institutional strengthening, and water use⁹⁴ may well reorient the agricultural sector.

Even in the 1960s, water concerns had been expressed in justifications for new dams.⁹⁵ World Bank and other finance stimulated investment in conjunction with Green Revolution technologies, the success of which led to further water resource development. The extent and rate of irrigation expansion across Asia is presented in Table 7.8. Technical potential for further expansion in Thailand is indicated in the continued expansion rate to 1995 of 2.7 percent compared to an overall Asian average of 2.4.

⁸⁸ Paopongsakorn, Nipon (1995)

⁸⁹ Siamwalla, Ammar (1987)

⁹⁰ NREP (1990)

⁹¹ Horbulyk, T.M. and Flatters, F. (1994)

⁹² Christensen, S.R. (1994)

⁹³ Christensen, S.R. and Voon-Long, Areeya (1994)

⁹⁴ World Bank (1986b)

⁹⁵ Donner, W. (1978)

Table 7.8 Percentage of Irrigated Areas in Arable Asian Croplands⁹⁶

Country	Irrigated Areas (‘000 ha)			Irrigated : Lands (%)			Annual Growth	
	1975	1985	1995	1975	1985	1995	1976-85	1986-95
Asia	121,165	140,792	179,013	27	29	35	1.50	2.40
Southeast Asia								
Cambodia	89	130	173	5	6	6	3.79	2.86
Indonesia	3,900	4,300	4,580	15	16	15	0.98	0.63
Lao - PDR	40	119	177	6	14	20	10.90	3.97
Malaysia	308	334	340	7	6	4	0.81	0.18
Myanmar	976	1,085	1,555	10	11	15	1.06	3.60
Philippines	1,040	1,440	1,580	14	16	17	3.25	0.93
<i>Thailand</i>	<i>2,419</i>	<i>3,822</i>	<i>5,004</i>	<i>15</i>	<i>19</i>	<i>24</i>	<i>4.57</i>	<i>2.69</i>
Vietnam	1,000	1,770	2,000	16	28	30	5.71	1.22
East Asia								
China	42,776	44,581	49,857	43	46	52	0.41	1.12
Japan	3,171	2,952	2,700	62	62	62	-0.72	-0.89
Rep. of Korea	1,277	1,325	1,335	57	62	67	0.37	0.08
Mongolia	23	60	80	3	4	6	9.59	2.88
South Asia								
Afghanistan	2,430	2,586	2,800	30	32	35	0.62	0.80
Bangladesh	1,441	2,073	3,200	16	23	37	3.64	4.34
Bhutan	22	30	39	20	23	26	3.10	2.62
India	33,730	41,779	50,100	20	25	30	2.14	1.82
Nepal	230	760	885	10	33	30	11.95	1.52
Pakistan	13,630	15,760	17,200	69	76	80	1.45	0.87
Sri Lanka	480	583	550	25	31	29	1.94	-0.58

Associated with agricultural expansion and intensification was the introduction of machinery to Thai agriculture. From a low base in 1950, the number of wheel tractor imports in 1961 had risen sevenfold to 1,487.⁹⁷ Full potential was estimated at 100,000 tractors, of which 20 percent was realised by 1967 when some 60 percent of wet rice cultivation in the Central Plain was conducted with tractors. Tractors were preferred to draught animals because they suited road transportation, powering of other agricultural equipment such as shellers, threshers, and pumps, and could plough to deeper levels. The social benefits of draught animals including companionship, self replenishment, savings, additional earnings,

⁹⁶ FAO (1998)

⁹⁷ Ingram, J.C. (1971)

and association with traditional culture, were lost to the Central Plain. But, as one tractor could plough in one hour between 24 and 36 times the area of one draught animal,⁹⁸ mechanisation was as inevitable as large dams, high yielding varieties, fertiliser, and pesticides. Land expansion had increased national production, now the Green Revolution was further increasing it through yield increases, albeit with much potential kept in reserve.

Agricultural mechanisation ranks seventh in an assessment of the top twenty greatest engineering achievements of the twentieth century, after electrification, automobiles, aeroplanes, water supply and distribution, electronics, and radio and television.⁹⁹ Determined on the basis of increased efficiency and productivity, the comparison is made between the ability of one 1900 USA farmer feeding 2.5 people, and the 1999 figure of more than 100, it is unsurprising that such benefits were demanded by countries such as Thailand. However, the markets which supported this revolution were not available to all farmers in the world. Nevertheless, planning has been based on such indicators of development being associated with increases in agricultural production and efficiency.

Credit had long been widely available through a sophisticated informal system which essentially combined information and risk in its costs.¹⁰⁰ With physical and information infrastructure development, lending rates reductions were possible, and government moved to assume the role through the Bank of Agriculture and Agricultural Cooperatives.¹⁰¹ Successful in many ways, the BAAC experienced difficulties in lending to the poorest of farmers in the absence of social trust approaches for small loans, as shown to be manageable in the Grameen Bank initiatives of Bangladesh and elsewhere.¹⁰² BAAC met most obvious credit needs of mid-range farmers from the 1970s in parallel with other forms of credit including hire-purchase, hire-sublease, contract farming packages, and traditional middlemen. A positive externality of formalised credit systems was a heightened awareness of the inequities in security of land ownership and tenancy.¹⁰³

⁹⁸ Inukai, I. (1970)

⁹⁹ GreatAchievements (2000)

¹⁰⁰ Siamwalla, Ammar et al (no date)

¹⁰¹ Siamwalla, Ammar (1986)

¹⁰² Siamwalla, Ammar (1993)

¹⁰³ Jutsuchon, Somchai (1989)

Social Effects

Expansion of Thai agriculture has been described in terms of; government benevolence to assist rural dwellers, recognition that Thailand is primarily an agricultural country, and that Thai culture is tied to agriculture. Each of these impressions contains fallacies which may be better understood in the context of the Ayutthaya shift to trade when rice became an exportable commodity. The tradition followed in recent times was one of agricultural and naturally extracted products being the primary form of trade to generate revenue to support the State and city. Hence the 1950s plans sought agricultural export led growth as Thailand's response to the perceived post-World War II needs for rapid economic expansion. Even some of the excesses in which members of the elite engaged in the opium trade¹⁰⁴ and predatory State attitudes to producers¹⁰⁵ are consistent with the time-honoured approach of seeking a tradeable commodity unrelated to national social objectives. Hence the absence of specific rural social policies is better assessed against Thailand's own history than foreign mores.

Thailand was vulnerable to piecemeal protection policies and international price variations which caused a large economic readjustment in 1984 when financial reserves were effectively exhausted, together with the patience of creditors. Bank failures at that time provided an unheeded portent of post-1997 adjustments; by that time industry contributed twice that of agriculture to GDP and was growing at 15 percent while agriculture continued low growth rates.¹⁰⁶ Agriculture was increasingly being considered a social sector associated with rural poverty.

Vacant land had provided a social buffer and the system seemed to suit independent peasants until agricultural prices fell in the 1980s and easily opened lands became rare. Rural to urban migration was slow due to the limited opportunities and the perceived limited skills of peasants, a view reversed during the building boom of the 1990s when they proved adaptable to many new tasks in cities. Urban incomes rose from 2.4 times that of rural incomes in 1976 to three times by 1998.¹⁰⁷ Thailand moved from being seen as a country with high levels

¹⁰⁴ McCoy, A.W. (1972)

¹⁰⁵ Sirirprachai, Somboon. (1998)

¹⁰⁶ Phongpaichit, Pasuk and Baker, C. (1998)

¹⁰⁷ Bello, W., Cunningham, S. and Kheng Poh, L. (1998)

of equality to the eighth most inequitable in terms of income distribution.¹⁰⁸ The long compliant and distant economic partners in the countryside who lived under quite different conditions from the modernising urban areas thus became the social problem of the 1990s.

Insecure land tenure had facilitated collection of agricultural commodities from the countryside. In some cases such as the North, overriding nation creation objectives led to long recalcitrant Chiang Mai nobles retaining large tracts of land such that, in 1975, 39 percent and 31 percent of lands in Chiang Mai and Lampang were under tenancy, and 20-30 percent of rural households were landless. National responses included a price support scheme for rice growers and a rural *tambol* (subdistrict) development scheme in what was perhaps the first real attempt at an equitable social development approach. Property rights were slow to be developed in upland areas and when introduced were confused and confusing with four government departments involved,¹⁰⁹ producing conflicting figures of owner operated lands.¹¹⁰ This may have remained an unaddressed social equity issue had not access to credit for participation in intensive agricultural expansion been latterly added to the Green Revolution development packages.

Land rights were eventually clarified for all non-forestry upland and lowland regions. In highland areas, national security transcended social issues, denying citizenship and land rights to many highland residents, with concomitant impact on their agriculture.¹¹¹ Land reform, intended to reallocate large private holdings to small-holders, was delayed by inter-agency regulations and failed to enjoy outcomes equivalent to elsewhere in Asia.¹¹² Less than 50 families received full land ownership and the area concerned amounted to less than 800 rai (128 hectare) over a 17 year period¹¹³ while tenancy increased nearly three-fold, particularly the Northeast.¹¹⁴ Very small land holders (up to 5 rai or 0.8 hectare) increased to 33 percent of the agricultural population by 1984.¹¹⁵ Since 1976,

¹⁰⁸ World Bank (1998b)

¹⁰⁹ Feder, G. et al (1988)

¹¹⁰ Brannon, R.H. (1978)

¹¹¹ Kunstadter, P. and Kundstadter, S. (1980)

¹¹² TDRI (no date).

¹¹³ ALRO (no date)

¹¹⁴ Pongpaivoon, Somkiat (1991)

¹¹⁵ CUSRI (1989)

land reform was seen as critical in social and economic terms,¹¹⁶ and yet, implemented in a perfunctory manner, gains were reversed through subsequent rural land speculation. The function of Agricultural Land Reform Office was shifted from reform to tenure issues in public forest lands from which its claimed success in reallocating some 7.6 million rai (1.2 million hectare) derives.¹¹⁷

The fourth agricultural census of 1993 built on those of 1978, 1963, and 1950, and contained the objectives of better defining land-holdings, use and tenure, inputs, and crop and livestock statistics.¹¹⁸ Population had been rising rapidly, more than doubling between 1950 and 1990, with the majority being absorbed into the expanding agricultural land areas. With an end of land expansion, large reserves of under-utilised labour grew in rural Thailand. By the early 1990s, about one million of these persons had moved out of agricultural labour to manufacturing and construction, and another four million to seasonal agricultural employment.¹¹⁹ Land holding ceased to indicate employment as fragmentation and declining farm sizes resulted from inheritance customs, particularly in the North.¹²⁰ Seasonal agricultural labour thus became an important definition in labour analyses.¹²¹ By 1993 it was clear that non-farm income, mainly derived from agriculturally related activities, was the major source of cash income for rural households.¹²² Farm gate rice price had long been a product of the export price less a government premium, exporter margin, milling fees, transportation costs, and middleman's margins. Small-holders linked this 15 percent cost¹²³ to government and merchants.

Drudgery in agriculture¹²⁴ had determined changes in regional rural lifestyles across centuries. Thai agriculture absorbed labour through land expansion¹²⁵ with the similar objective of enhancing lifestyle. Thailand had the second highest percentage (82 percent) of labour in agriculture in Asia by 1965

¹¹⁶ Lin, Sein and Esposito, B. (1976)

¹¹⁷ Bello, W., Cunningham, S. and Kheng Poh, L. (1998)

¹¹⁸ National Statistical Office (1993)

¹¹⁹ National Statistical Office (1988)

¹²⁰ Sompop, P. (1985)

¹²¹ World Bank (1980b)

¹²² World Bank (1983c)

¹²³ Usher, D. (1967)

¹²⁴ Durrenberger, E.P. and Tannenbaum, N. (1990)

¹²⁵ Christensen, S.R. et al (no date)

and the highest (76 percent) by 1973,¹²⁶ dropping to 71 percent by 1980.¹²⁷ Permanent arrangements for seasonal migrations to harvest rice, long a characteristic of Thai agriculture, succumbed to the first opportunity being taken¹²⁸ in a labour market served by poverty.¹²⁹ Labour drifted with crop diversification¹³⁰ in response to financial incentives¹³¹ and exploited the climatic variations of Thailand¹³² as outlined in detailed studies of the 1960s and 1970s.¹³³ Additional labour allowed labour intensive crops to be grown; ground nuts required 165 percent of the labour of single-cropped paddy rice, cotton 203 percent, sugarcane 182 percent, and rubber 158 percent.¹³⁴

Slow technology adoption challenged conventional development theory.¹³⁵ Apparent rural acceptance of rising differences between urban and rural lifestyles, and insistence on utilising known techniques to produce family food with a small saleable surplus, was interpreted as resistance to change. In fact it was a rational decision from the knowledge and experience base of the small-holder. Technically recommendations for post-harvest facilities, pest control, mechanisation, and improved water and fertiliser usage¹³⁶ ignored small-holder concerns. Recommendations to government for improved land tenure, soil management, increased cropping intensity and productivity, improved livestock breeding and production, enhanced farmer agricultural knowledge, improved efficiency of agricultural institutions, and enhanced information and education dissemination,¹³⁷ similarly assumed an equitable intent in underlying policies. Success stories in dairy production, fruit and vegetables, some rice technologies, and field crops, and spectacular failures,¹³⁸ provided clues to the need for equality of access to education, health, and other services. By 1982, agricultural and non-agricultural incomes were 2,041 compared to 15,422 baht per annum.¹³⁹

¹²⁶ World Bank (1985b)

¹²⁷ Siamwalla, Ammar (1986)

¹²⁸ Chalamwong, Y. (1982)

¹²⁹ Panpiemras, Kosit and Krusaunsombat, Somchai (1985)

¹³⁰ Spoelstra, N. and Isarangkun, C. (1976)

¹³¹ Chalamwong, Yongyuth and Khatikarn, Kanok (1985)

¹³² Norman, M.J.T. (1973)

¹³³ Ho, R. and Chapman, E.C. (1973)

¹³⁴ Pongtanakorn, Chaipant et al (1987)

¹³⁵ Muscat, R. J. (1966)

¹³⁶ Sato, T. (1966)

¹³⁷ Patanapongsa, Narinchai (1983)

¹³⁸ Paopongsakorn, Nipon (1995)

¹³⁹ Phongpaichit, Pasuk and Baker, C. (1997)

Declining export prices correlate with rising poverty incidences of between 27 percent and 37 percent through the 1980s. Over the period 1975 to 1989, the poor were characterised as; farmers (rising from 74 to 82 percent of the poor), village dwellers (84 to 91 percent), and those with only elementary education (80 to 82 percent). Assumptions that rice price increases could alleviate poverty were proved false.¹⁴⁰ Poverty was clearly associated with inferior land, lack of access to irrigation, small land holding size,¹⁴¹ and lack of access to social services.

With poverty came increased environmental risks. Mutual causality between rural poverty and deforestation led to insightful social forestry projects.¹⁴² Poverty alleviation programs in rice areas began to acknowledge regional and production system differences. Poor highland shifting agriculturists,¹⁴³ for example, could benefit through perennial fruit tree crop intensification which incidentally reduced land pressure. The confused legal and regulatory regimes¹⁴⁴ of the Thai highlands limited bartering and small-scale commerce under conditions of relatively low availability of rice, similar to parts of Lao-PDR.¹⁴⁵ Conflicting with environmental objectives,¹⁴⁶ slow action on highland development options such as cattle development¹⁴⁷ as a self-transportable product¹⁴⁸ perhaps linking beyond localised demand,¹⁴⁹ has increased poverty and environmental decline. Self-sufficient integrated crop and livestock systems of Lao-PDR¹⁵⁰ differ little from past and marginalised systems of Thailand.¹⁵¹ The technical efficiencies of such systems,¹⁵² which exist even in poverty conditions, are often only perceived once modern agriculture is introduced.¹⁵³

¹⁴⁰ Siamwalla, Ammar (1992)

¹⁴¹ Siamwalla, Ammar (1991)

¹⁴² Tongpan, Sopin et al (1990)

¹⁴³ Judd, L.C. (1980)

¹⁴⁴ TDRI (1994)

¹⁴⁵ Theerasasawat, Suwit (1998)

¹⁴⁶ Bouahom, Bounthong (1998)

¹⁴⁷ Phonvisay, Singkham (1998)

¹⁴⁸ Carson, S. (1998)

¹⁴⁹ Warr, P.G. (1998c)

¹⁵⁰ Pravongviengkham, Parisak (1997)

¹⁵¹ Rerkasem, Kanok (1997)

¹⁵² Falvey (1995)

¹⁵³ Cheva-isarakul, Boonserm (1998)

Rural poverty may exceed official estimates.¹⁵⁴ Its unintended aggravation by development plans¹⁵⁵ has now caused agriculture to be considered in social terms, drawing on demonstrations of small-holder enterprises, including agro-industry, of Royal and other projects.¹⁵⁶

Concerns of the decline in rural environments,¹⁵⁷ unmatched by real costings of further urban development,¹⁵⁸ now fuel a possible reconsideration of social equity issues in rural areas. However, linking poverty to the environment can obscure Thailand's unique position; within Asia, Thailand had the second highest area of arable land per person in 1990, and by 2025 is expected to have the highest level. The success of Thailand's population control strategy has allowed the tradition of lower intensity agriculture to be maintained as an environmental buffer. No such social buffer continues to exist.

With a continuing need for improved rural and social policies, an education issue has emerged. Rural labour productivity and progressiveness have been shown to be correlated, particularly for adult education. Labour productivity benefits from early entry to school, visits to agricultural demonstrations and research stations, a higher level of education, study of some agricultural subjects in primary school, and participation in farmers groups.¹⁵⁹ The future of Thai agriculture will depend on improved general and agricultural education.

Post-1997 Agriculture

As a relatively small and open economy, Thailand is highly exposed to external economic forces.¹⁶⁰ Agriculture as a low yielding sector requiring long term and major capital investment was unattractive to the private sector and government alike during the pre-1997 growth.¹⁶¹ Glimpses of the importance of agriculture to GDP can now be seen across the pre- and post-1997 crisis period

¹⁵⁴ Warr, P.G. (1998a)

¹⁵⁵ Jutsuchon, Somchai (1989)

¹⁵⁶ Industrial Management (1994)

¹⁵⁷ Kunstadter, P. (1989a)

¹⁵⁸ World Bank (1980c)

¹⁵⁹ Buripakdi, Chalio (1971)

¹⁶⁰ Sahasakul, Chaipat (1987)

¹⁶¹ Bello, W., Cunningham, S. and Kheng Poh, L. (1998)

(Table 7.9), as can its separation from the excessive economic activity prior to the crisis.

Table 7.9 Sectoral Contributions to GDP in Pre and Post Crisis Thailand¹⁶²

GDP Growth	1995	1996	1997	1998
Total	8.8	5.5	0.0	-5.5
Agriculture	2.5	3.8	3.0	2.8
Manufacturing	11.2	6.9	-0.7	-1.4
Construction	7.4	6.1	-12.7	-23.9

Just two decades earlier, farmers were encouraged through irrigation development to plant a second rice crop. By the 1990s, farmers were encouraged to plant crops with lower water demands as priority for water shifted from agriculture to electricity and metropolitan supply.¹⁶³ So much has changed to past assumptions of rural inequities being of little threat to political stability. Past policy biases against agriculture, apparent resilience to a poor regulatory environment,¹⁶⁴ informed yet disadvantaged rural dwellers, a changed natural environment, and a continuing downward trend in commodity prices, are now increasing concern of instability in rural areas.¹⁶⁵

The 1990s have highlighted different values between urban and rural Thai in a manner reminiscent of the descriptions of the Chinese and Thai differences of the 1930s,¹⁶⁶ notwithstanding the latter's contributions to the private sector.¹⁶⁷ The 1997 economic crisis affected most groups, although benefits of the preceding period were concentrated in the urban sector.¹⁶⁸ For rural dwellers,¹⁶⁹ high rice prices may have ameliorated some effects of the crisis if global markets and weather had been favourable;¹⁷⁰ food manufacturing appears to be an exception.¹⁷¹ Export values for Thai manufacturing and agricultural products from 1990 to 1998 indicate

¹⁶² Bangkok Bank (1998)

¹⁶³ Bello, W., Cunningham, S. and Kheng Poh, L. (1998)

¹⁶⁴ Behrman, J.R. (1968)

¹⁶⁵ Bello, W., Cunningham, S. and Kheng Poh, L. (1998)

¹⁶⁶ Landon, K.P. (1940)

¹⁶⁷ Timmer, C.P. (1991)

¹⁶⁸ Warr, P.G. (1998b)

¹⁶⁹ Siamwalla, Ammar (1999)

¹⁷⁰ Sarntisart, Isra (1999)

¹⁷¹ Sondergard, L. (1999)

a short term post-1997 increase in agricultural production and export;¹⁷² in the first quarter of 1998, rice exports of 2.4 million ton were valued at some 34 billion baht, 240 percent more than the baht value of 1997 for the same period, more than compensating for devaluation of the baht.¹⁷³ The crisis has depressed Thailand's Asian markets affecting it more than other major agricultural exporters,¹⁷⁴ although this is already changing and the long term decline in the contribution of agriculture to the economy¹⁷⁵ has been temporarily interrupted. Labour productivity indices for agriculture of 0.26 compare to 2.0 for the manufacturing sector and 1.4 for the service sector, providing an indicator of the lower prices received for agricultural commodities and the higher population supported in rural areas¹⁷⁶ while employment in agriculture continues a long-term downward trend.¹⁷⁷ While development models might conclude that those who remain in agriculture must become more efficient and capital intensive, the need for a sound social policy remains an imperative for disadvantaged rural dwellers who continue as subsistence agriculturists, or who move out of agriculture.¹⁷⁸

Post-crisis adjustment of the eighth plan produced an agricultural master plan to increase exports to drought affected markets, and lower farmer living costs through; integrated agricultural export zones, research and development, quality control, reorganisation of the Ministry of Agriculture and Cooperatives, reductions in the use of agricultural chemicals, improvements in land use and ownership, and establishment of weather risk sites.¹⁷⁹ Issues of landlessness, income disparity, unemployment,¹⁸⁰ and rural-urban relationships¹⁸¹ echo forecasts of the 1970s.¹⁸² Small-holder cultivation, a critical social mechanism in Thailand, appears viable into the future under expected political conditions¹⁸³ possibly in association with off-farm labour,¹⁸⁴ and through an increase in status accorded to self-sufficiency.

¹⁷² Warr, P.G. (1998b)

¹⁷³ Bangkok Post (1998)

¹⁷⁴ Paopongsakorn, Nipon (1999)

¹⁷⁵ Coxhead, I and Plaugsraphan, Jiraporn (1998)

¹⁷⁶ Tantivadakarn, Cayun (1999)

¹⁷⁷ World Bank (1987)

¹⁷⁸ Paopongsakorn, Nipon (1999)

¹⁷⁹ Bangkok Post (1998)

¹⁸⁰ Rogers, K.D. and Itharattana, Prasit (1976)

¹⁸¹ Pakkasem, Phisit (1979)

¹⁸² Fuhs, F.W. (1979)

¹⁸³ Girling, J. (1986)

¹⁸⁴ Paxson, C.H. (1992)

A New Agricultural Paradigm

After a period of rapid growth and consolidation in agriculture, broader economic events can easily overshadow the successes and failures in the agricultural sector. Notwithstanding recent economic setbacks, the long term future of Thailand's natural resources continue to require both the attention of planners¹⁸⁵ and the public. Issues of irreversible changes to the Thai landscape from rice and rubber agriculture, upland deforestation and coastal prawn aquaculture among other activities, changes in water regimes from agriculture and logging, as well as irrigation and uncontrolled groundwater extraction, are now complemented by environmental concerns relating to pollution from agriculture and agribusiness.

Traditional retention of native trees by small-holders,¹⁸⁶ and social-reforestation programs,¹⁸⁷ point to the environmental scope of rural projects in an era when value is ascribed to natural resources¹⁸⁸ with increased requirements for realistic environmental analyses and public accountability.¹⁸⁹ Fertiliser and pesticide environmental flows and agro-industrial leakages¹⁹⁰ are now scrutinised in a global and national ethic. One hopes that environment is not raised above social equity amidst this new fervour. The period of easy agricultural development ended in the 1990s, as may have security and nation building priorities. In this new circumstance, an evolution into three types of agriculture for Thailand may well be indicated to government:

Agriculture Type	Government Inputs
Commercial	Improved education and research in environmental management and technologies
Self sufficient	Social safety-net policies; Environmental awareness activities; Rural agribusiness and off-farm opportunities
Mixed	All of the above plus freedom of lifestyle choice in agriculture and rural life varying over time

¹⁸⁵ Phantumvanit, Dhira and Sathirathai, Suthawan (1998)

¹⁸⁶ Ingersoll, J. (1969)

¹⁸⁷ TDRI (1989)

¹⁸⁸ Sadoff, C.W. (1992)

¹⁸⁹ Hirsch, P. (1998)

¹⁹⁰ Kaosaard, Mingsarn and Kositrat, Nisakorn (1993)

The major commodities of Thai agriculture, and roles of government and agribusiness, will be determined by practices of today which are discussed in terms of crops, livestock, forestry, and associated businesses and institutions in the following chapters.

Summary

Key points pertinent to Thai agriculture which may be elicited from consideration of the 1990s include:

- Decreased relative contributions of agriculture to GDP belied its importance in terms of employment, resilience in times of crisis, rural social support, and as a cultural basis for the nation, as it remained productive as a result of favourable environmental circumstance and long-suffering peasants when policies of recent decades reflected established views of agriculture as a productive coffer which required little investment.
- National planning focussed development and facilitated foreign inputs, finally committing Thailand irrevocably to the global economy, although it adopted a generic planning approach which under-valued self-sufficiency aspects and investment needs of agriculture while it overstated industrialisation prospects in a poorly regulated institutional environment.
- The end of easy expansion of agriculture through opening of new lands, coupled with the planning approach to funding State projects, facilitated the adoption of Green Revolution technologies which have allowed continuous increases in production at a relatively lower environmental cost than other countries, while rural poverty increased with uneven distribution of economic benefits.